



FIRESHIELD

Phone: 253-851-0030 Fax: 253-851-9782
P.O.BOX 2389 Gig Harbor, WA 98335
www.fireshieldinc.com

Project:

Walmart- Puyallup Store No. 02403-254
310 31st AVE SE Puyallup, WA

Hydraulic Calculations



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS5 GR STOCK 8+1.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

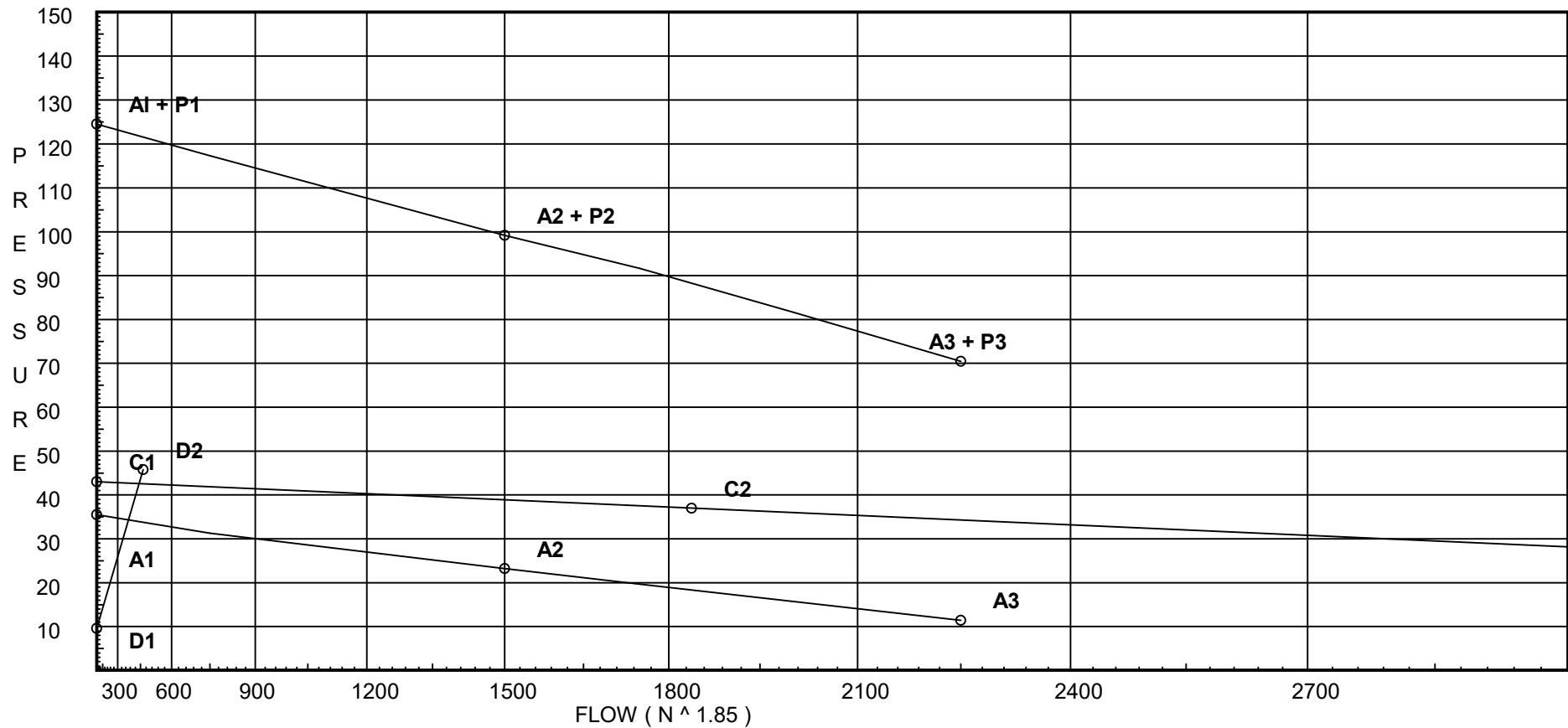
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.576
D2 - System Flow : 463.709
D2 - System Pressure : 45.746
Hose (Demand) :
D3 - System Demand : 463.709
Hose (Adj City) : 250
Safety Margin : 75.063



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.809	463.71	45.746
TEST	43.0	37	1839.0	41.958	713.71	41.958

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>	
SP01	20.54	11.2	21.0	51.32	0.01	130
EQ01	19.79		25.6			
SP05	20.86	11.2	21.0	51.32	0.01	130
EQ05	20.11		25.6			
SP03	20.79	11.2	21.0	51.32	0.01	130
EQ03	20.04		25.6			
SP02	20.65	11.2	21.0	51.32	0.01	130
EQ02	19.9		25.6			
SP04	20.92	11.2	21.0	51.32	0.01	130
EQ04	20.17		25.6			
527	20.11	10.14	25.6	51.33	K=K @ EQ05	
568	21.03		25.79			
530	21.03		25.85			
531	21.03		26.05			
532	21.03		26.27			
533	21.03		26.52			
534	21.03		26.82			
535	21.03		27.09			
536	21.03		27.35			
537	21.03		27.59			
538	21.03		27.82			
539	21.03		28.03			
540	21.03		28.22			
541	21.03		28.39			
542	21.03		28.54			
543	21.03		28.66			
544	21.03		28.75			
545	21.03		28.8			
546	21.03		28.86			
547	21.03		28.88			
548	21.03		28.9			
549	21.03		28.92			
550	21.03		28.92			
551	21.03		28.93			
552	19.59		30.12			
553	18.76		30.52			
554	18.76		30.52			
555	18.76		30.52			
556	18.76		30.53			
557	18.76		30.53			
558	18.76		30.54			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
559	18.76		30.55		
560	18.76		30.57		
561	18.76		30.59		
562	18.76		30.63		
525	18.76		30.74		
526	16.58		33.02		
TR5	16.41		36.58		
BR5	2.83		42.84		
BR4	2.83		42.85		
BR3	2.83		42.91		
127	2.792		44.32		
128	2.0		44.8		
PO	1.08		45.75		
PI	1.08		33.04		
FLG	-5.0		35.94		
TEST	-2.0		41.96	250.0	
528	20.04	10.14	25.63	51.35	K=K @ EQ03
529	19.9	10.14	25.7	51.42	K=K @ EQ02
564	19.79	10.14	25.8	51.53	K=K @ EQ01
563	19.59		26.5		
513	19.59		26.54		
514	19.59		26.69		
515	19.59		26.85		
516	18.76		27.87		
517	18.76		28.08		
518	18.76		28.3		
519	18.76		28.53		
520	18.76		28.76		
521	18.76		29.0		
522	18.76		29.26		
523	18.76		29.52		
524	18.76		29.79		
565	20.17	10.14	25.64	51.36	K=K @ EQ04
566	20.04	10.14	25.68	51.41	K=K @ EQ03
567	19.9	10.14	25.75	51.48	K=K @ EQ02
605	19.79	10.14	25.86	51.58	K=K @ EQ01
606	19.79	10.14	26.55	52.26	K=K @ EQ01
597	20.47		26.9		
596	20.33		26.99		
598	20.2		27.08		
599	20.06		27.17		
569	19.59		27.49		
600	20.47		27.17		
601	20.33		27.25		
602	20.2		27.33		
603	20.06		27.41		
570	19.59		27.7		
604	20.06		27.65		
571	19.59		27.92		
572	19.59		28.15		
573	19.59		28.39		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
574	19.59		28.63		
575	19.59		28.88		
576	19.59		29.13		
577	19.59		29.4		
578	19.59		30.18		
579	19.59		30.16		
580	19.59		30.15		
581	19.59		30.14		
582	19.59		30.13		
592	20.49		29.37		
593	20.35		29.48		
594	20.2		29.61		
595	20.04		29.73		
583	19.59		30.12		
588	20.49		29.38		
587	20.35		29.49		
589	20.2		29.61		
590	20.04		29.74		
584	19.59		30.12		
591	20.04		29.74		
585	19.59		30.12		
586	19.59		30.12		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
SP01 to EQ01	20.54 19.79	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ01			0.0 51.32					25.603		K Factor = 10.14	
SP05 to EQ05	20.86 20.11	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ05			0.0 51.32					25.603		K Factor = 10.14	
SP03 to EQ03	20.79 20.04	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ03			0.0 51.32					25.603		K Factor = 10.14	
SP02 to EQ02	20.65 19.9	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ02			0.0 51.32					25.603		K Factor = 10.14	
SP04 to EQ04	20.92 20.17	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ04			0.0 51.32					25.603		K Factor = 10.14	
527 to 568	20.11 21.03	10.14	75.77 75.77	3 3.26	T 20.159	76.160 20.159 96.319	120 0.0061	25.603 -0.398 0.588		K = K @ EQ05 Vel = 2.91	
568 to 530	21.03 21.03		0.0 75.77	3 3.26		9.000 9.000	120 0.0061	25.793 0.0 0.055		Vel = 2.91	
530 to 531	21.03 21.03		77.55 153.32	3 3.26		9.000 9.000	120 0.0226	25.848 0.0 0.203		Vel = 5.89	
531 to 532	21.03 21.03		16.10 169.42	3 3.26		8.000 8.000	120 0.0271	26.051 0.0 0.217		Vel = 6.51	
532 to 533	21.03 21.03		13.14 182.56	3 3.26		8.000 8.000	120 0.0311	26.268 0.0 0.249		Vel = 7.02	
533 to 534	21.03 21.03		-8.33 174.23	3 3.26		10.500 10.500	120 0.0285	26.517 0.0 0.299		Vel = 6.70	
534 to 535	21.03 21.03		-7.16 167.07	3 3.26		10.500 10.500	120 0.0265	26.816 0.0 0.278		Vel = 6.42	
535 to 536	21.03 21.03		-6.31 160.76	3 3.26		10.500 10.500	120 0.0246	27.094 0.0 0.258		Vel = 6.18	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
536 to 537	21.03 21.03		-5.80 154.96	3 3.26			10.500 10.500	120 0.0230	27.352 0.0 0.241		Vel = 5.96	
537 to 538	21.03 21.03		-5.70 149.26	3 3.26			10.500 10.500	120 0.0214	27.593 0.0 0.225		Vel = 5.74	
538 to 539	21.03 21.03		-5.98 143.28	3 3.26			10.500 10.500	120 0.0199	27.818 0.0 0.209		Vel = 5.51	
539 to 540	21.03 21.03		-6.63 136.65	3 3.26			10.500 10.500	120 0.0182	28.027 0.0 0.191		Vel = 5.25	
540 to 541	21.03 21.03		-7.60 129.05	3 3.26			10.500 10.500	120 0.0164	28.218 0.0 0.172		Vel = 4.96	
541 to 542	21.03 21.03		-8.83 120.22	3 3.26			10.500 10.500	120 0.0144	28.390 0.0 0.151		Vel = 4.62	
542 to 543	21.03 21.03		-14.95 105.27	3 3.26			10.500 10.500	120 0.0111	28.541 0.0 0.117		Vel = 4.05	
543 to 544	21.03 21.03		-13.82 91.45	3 3.26			10.500 10.500	120 0.0087	28.658 0.0 0.091		Vel = 3.52	
544 to 545	21.03 21.03		-12.88 78.57	3 3.26			7.500 7.500	120 0.0065	28.749 0.0 0.049		Vel = 3.02	
545 to 546	21.03 21.03		-11.75 66.82	3 3.26			13.500 13.500	120 0.0049	28.798 0.0 0.066		Vel = 2.57	
546 to 547	21.03 21.03		-11.61 55.21	3 3.26			6.170 6.170	120 0.0034	28.864 0.0 0.021		Vel = 2.12	
547 to 548	21.03 21.03		-11.36 43.85	3 3.26			9.000 9.000	120 0.0022	28.885 0.0 0.020		Vel = 1.69	
548 to 549	21.03 21.03		-11.12 32.73	3 3.26			10.000 10.000	120 0.0013	28.905 0.0 0.013		Vel = 1.26	
549 to 550	21.03 21.03		-10.96 21.77	3 3.26			10.000 10.000	120 0.0006	28.918 0.0 0.006		Vel = 0.84	
550 to 551	21.03 21.03		-10.90 10.87	3 3.26			9.000 9.000	120 0.0002	28.924 0.0 0.002		Vel = 0.42	
551 to 552	21.03 19.59		0.0 10.87	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0042	28.926 0.624 0.565		Vel = 1.57	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
552 to 553	19.59 18.76		0.0 10.87	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0043	30.115 0.359 0.046		Vel = 1.57	
553 to 554	18.76 18.76		0.0 10.87	4 4.26		9.000 9.000	120 0	30.520 0.0 0.0		Vel = 0.24	
554 to 555	18.76 18.76		10.90 21.77	4 4.26		10.000 10.000	120 0.0002	30.520 0.0 0.002		Vel = 0.49	
555 to 556	18.76 18.76		10.96 32.73	4 4.26		10.000 10.000	120 0.0004	30.522 0.0 0.004		Vel = 0.74	
556 to 557	18.76 18.76		11.12 43.85	4 4.26		9.000 9.000	120 0.0006	30.526 0.0 0.005		Vel = 0.99	
557 to 558	18.76 18.76		11.36 55.21	4 4.26		6.170 6.170	120 0.0010	30.531 0.0 0.006		Vel = 1.24	
558 to 559	18.76 18.76		11.61 66.82	4 4.26		10.500 10.500	120 0.0012	30.537 0.0 0.013		Vel = 1.50	
559 to 560	18.76 18.76		11.75 78.57	4 4.26		10.500 10.500	120 0.0018	30.550 0.0 0.019		Vel = 1.77	
560 to 561	18.76 18.76		12.88 91.45	4 4.26		10.500 10.500	120 0.0024	30.569 0.0 0.025		Vel = 2.06	
561 to 562	18.76 18.76		13.82 105.27	4 4.26		10.500 10.500	120 0.0030	30.594 0.0 0.032		Vel = 2.37	
562 to 525	18.76 18.76		14.95 120.22	4 4.26	T 26.334	2.000 26.334 28.334	120 0.0039	30.626 0.0 0.110		Vel = 2.71	
525 to 526	18.76 16.58		343.49 463.71	6 6.357	E 17.603	180.010 17.603 197.613	120 0.0068	30.736 0.944 1.335		Vel = 4.69	
526 to TR5	16.58 16.41		0.0 463.71	6 6.357	6E 105.616	412.050 105.616 517.666	120 0.0067	33.015 0.074 3.494		Vel = 4.69	
TR5 to BR5	16.41 2.830		0.0 463.71	6 6.357	T 37.72 3.772	13.570 41.492 55.062	120 0.0067	36.583 5.882 0.371		Vel = 4.69	
BR5 to BR4	2.830 2.83		0.0 463.71	6 6.357		1.833 1.833	120 0.0071	42.836 0.0 0.013		Vel = 4.69	
BR4 to BR3	2.83 2.83		0.0 463.71	4 4.26		1.250 1.250	120 0.0472	42.849 0.0 0.059		Vel = 10.44	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
BR3 to 127	2.83 2.792		0.0 463.71	4	T	26.334	3.170 26.334 29.504	120	42.908 0.016 1.400			
127 to 128	2.792 2		0.0 463.71	6	E	17.603	2.375 17.603 19.978	120	44.324 0.343 0.135		Vel = 10.44	
128 to PO	2 1.080		0.0 463.71	8	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120	44.802 0.398 0.546		Vel = 2.78	
PO			0.0 463.71						45.746		K Factor = 68.56	
System Demand Pressure									45.746			
Safety Margin									75.063			
Continuation Pressure									120.809			
Pressure @ Pump Outlet									120.809			
Pressure From Pump Curve									-87.767			
Pressure @ Pump Inlet									33.042			
PI to FLG	1.080 -5		0.0 463.71	8	5E G	105.706 4.698	28.750 110.404 139.154	120	33.042 2.633 0.264		Vel = 2.78	
FLG to TEST	-5 -2		0.0 463.71	8	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140	35.939 5.701 0.319		* * Fixed Loss = 7 Vel = 2.77	
TEST			250.00 713.71						41.959		Qa = 250.00 K Factor = 110.18	
527 to 528	20.11 20.04		-24.44 -24.44	3			6.000 6.000	120	25.603 0.030 -0.004		Vel = 0.94	
528 to 529	20.04 19.9	10.14	51.35	3			11.000 11.000	120	25.629 0.061 0.009		K = K @ EQ03 Vel = 1.03	
529 to 564	19.9 19.79	10.14	51.42	3			9.000 9.000	120	25.699 0.048 0.058		K = K @ EQ02 Vel = 3.01	
564 to 563	19.79 19.59	10.14	51.52	3	T	20.159	16.840 20.159 36.999	120	25.805 0.087 0.613		K = K @ EQ01 Vel = 4.99	
563 to 513	19.59 19.59		0.0	4			9.000 9.000	120	26.505 0.0 0.040		Vel = 2.92	
513 to 514	19.59 19.59		129.85	4			9.000 9.000	120	26.545 0.0 0.145		Vel = 5.81	
514 to 515	19.59 19.59		258.13	4			9.000 8.000	120	26.690 0.0 0.163		Vel = 6.62	
515 to 516	19.59 18.76		-13.15 281.14	4	2E	26.334	8.830 26.334 35.164	120	26.853 0.359 0.662		Vel = 6.33	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
516 to 517	18.76 18.76		8.34 289.48	4 4.26			10.500 10.500	120 0.0198	27.874 0.0 0.208		Vel = 6.52	
517 to 518	18.76 18.76		7.16 296.64	4 4.26			10.500 10.500	120 0.0208	28.082 0.0 0.218		Vel = 6.68	
518 to 519	18.76 18.76		6.30 302.94	4 4.26			10.500 10.500	120 0.0215	28.300 0.0 0.226		Vel = 6.82	
519 to 520	18.76 18.76		5.81 308.75	4 4.26			10.500 10.500	120 0.0224	28.526 0.0 0.235		Vel = 6.95	
520 to 521	18.76 18.76		5.69 314.44	4 4.26			10.500 10.500	120 0.0231	28.761 0.0 0.243		Vel = 7.08	
521 to 522	18.76 18.76		5.99 320.43	4 4.26			10.500 10.500	120 0.0239	29.004 0.0 0.251		Vel = 7.21	
522 to 523	18.76 18.76		6.63 327.06	4 4.26			10.500 10.500	120 0.0249	29.255 0.0 0.261		Vel = 7.36	
523 to 524	18.76 18.76		7.60 334.66	4 4.26			10.500 10.500	120 0.0259	29.516 0.0 0.272		Vel = 7.53	
524 to 525	18.76 18.76		8.83 343.49	4 4.26	T	26.334	8.500 26.334 34.834	120 0.0272	29.788 0.0 0.948		Vel = 7.73	
525			0.0 343.49						30.736		K Factor = 61.96	
530 to 565	21.03 20.17		-77.55 -77.55	3 3.26	T	20.159	71.160 20.159 91.319	120 -0.0064	25.848 0.372 -0.582		Vel = 2.98	
565 to 566	20.17 20.04	10.14	51.36 -26.19	3 3.26			11.000 11.000	120 -0.0008	25.638 0.056 -0.009		K = K @ EQ04	
566 to 567	20.04 19.9	10.14	51.41 25.22	3 3.26			11.000 11.000	120 0.0007	25.685 0.061 0.008		K = K @ EQ03	
567 to 605	19.9 19.79	10.14	51.47 76.69	3 3.26			9.000 9.000	120 0.0062	25.754 0.048 0.056		K = K @ EQ02	
605 to 513	19.79 19.59	10.14	51.58 128.27	3 3.26	T	20.159	16.930 20.159 37.089	120 0.0162	25.858 0.087 0.600		K = K @ EQ01	
513			0.0 128.27						26.545		K Factor = 24.90	
531 to 606	21.03 19.79		-16.10 -16.1	3 3.26	T	20.159	102.160 20.159 122.319	120 -0.0003	26.051 0.537 -0.042		Vel = 0.62	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
606 to 514	19.79 19.59	10.14	52.26 36.16	3 3.26	T 20.159	16.840 20.159 36.999	120 0.0015	26.546 0.087 0.057		K = K @ EQ01 Vel = 1.39	
514			0.0 36.16					26.690		K Factor = 7.00	
515 to 532	19.59 21.03		13.15 13.15	3 3.26	2T 40.319	119.000 40.319 159.319	120 0.0002	26.853 -0.624 0.039		Vel = 0.51	
532			0.0 13.15					26.268		K Factor = 2.57	
533 to 597	21.03 20.47		8.33 8.33	1.5 1.682	T 9.9	46.500 9.900 56.400	120 0.0026	26.517 0.243 0.145		Vel = 1.20	
597 to 596	20.47 20.33		0.0 8.33	1.5 1.682		11.000 11.000	120 0.0025	26.905 0.061 0.028		Vel = 1.20	
596 to 598	20.33 20.2		0.0 8.33	1.5 1.682		11.000 11.000	120 0.0026	26.994 0.056 0.029		Vel = 1.20	
598 to 599	20.2 20.06		0.0 8.33	1.5 1.682		11.500 11.500	120 0.0025	27.079 0.061 0.029		Vel = 1.20	
599 to 569	20.06 19.59		0.0 8.33	1.5 1.682	E 4.95	39.010 4.950 43.960	120 0.0026	27.169 0.204 0.113		Vel = 1.20	
569 to 516	19.59 18.76		0.0 8.33	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0027	27.486 0.359 0.029		Vel = 1.20	
516			0.0 8.33					27.874		K Factor = 1.58	
534 to 600	21.03 20.47		7.16 7.16	1.5 1.682	T 9.9	46.500 9.900 56.400	120 0.0020	26.816 0.243 0.110		Vel = 1.03	
600 to 601	20.47 20.33		0.0 7.16	1.5 1.682		11.000 11.000	120 0.0019	27.169 0.061 0.021		Vel = 1.03	
601 to 602	20.33 20.2		0.0 7.16	1.5 1.682		11.000 11.000	120 0.0020	27.251 0.056 0.022		Vel = 1.03	
602 to 603	20.2 20.06		0.0 7.16	1.5 1.682		11.500 11.500	120 0.0019	27.329 0.061 0.022		Vel = 1.03	
603 to 570	20.06 19.59		0.0 7.16	1.5 1.682	E 4.95	39.010 4.950 43.960	120 0.0020	27.412 0.204 0.086		Vel = 1.03	
570 to 517	19.59 18.76		0.0 7.16	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0020	27.702 0.359 0.021		Vel = 1.03	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
517			0.0 7.16					28.082		K Factor = 1.35	
535 to 604	21.03 20.06		6.30 6.3	1.5 1.682	T E 9.9	80.000 9.900 89.900	120 0.0015	27.094 0.420 0.138		Vel = 0.91	
604 to 571	20.06 19.59		0.0 6.3	1.5 1.682	E 9.9	39.010 4.950 43.960	120 0.0015	27.652 0.204 0.068		Vel = 0.91	
571 to 518	19.59 18.76		0.0 6.3	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0016	27.924 0.359 0.017		Vel = 0.91	
518			0.0 6.30					28.300		K Factor = 1.18	
536 to 572	21.03 19.59		5.80 5.8	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0013	27.352 0.624 0.177		Vel = 0.84	
572 to 519	19.59 18.76		0.0 5.8	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0013	28.153 0.359 0.014		Vel = 0.84	
519			0.0 5.80					28.526		K Factor = 1.09	
537 to 573	21.03 19.59		5.70 5.7	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0013	27.593 0.624 0.171		Vel = 0.82	
573 to 520	19.59 18.76		0.0 5.7	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0013	28.388 0.359 0.014		Vel = 0.82	
520			0.0 5.70					28.761		K Factor = 1.06	
538 to 574	21.03 19.59		5.98 5.98	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0014	27.818 0.624 0.187		Vel = 0.86	
574 to 521	19.59 18.76		0.0 5.98	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0015	28.629 0.359 0.016		Vel = 0.86	
521			0.0 5.98					29.004		K Factor = 1.11	
539 to 575	21.03 19.59		6.64 6.64	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0017	28.027 0.624 0.226		Vel = 0.96	
575 to 522	19.59 18.76		0.0 6.64	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0018	28.877 0.359 0.019		Vel = 0.96	
522			0.0 6.64					29.255		K Factor = 1.23	
540 to 576	21.03 19.59		7.60 7.6	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0022	28.218 0.624 0.291		Vel = 1.10	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
576 to 523	19.59 18.76		0.0 7.6	1.5 1.682	T E	9.9 4.95	0.830 9.900 10.730	120 0.359 0.024		Vel = 1.10	
523			0.0 7.60					29.516		K Factor = 1.40	
541 to 577	21.03 19.59		8.82 8.82	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.624 0.384		Vel = 1.27	
577 to 524	19.59 18.76		0.0 8.82	1.5 1.682	T E	9.9 4.95	0.830 9.900 10.730	120 0.359 0.031		Vel = 1.27	
524			0.0 8.82					29.788		K Factor = 1.62	
542 to 578	21.03 19.59		14.95 14.95	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.624 1.020		Vel = 2.16	
578 to 562	19.59 18.76		0.0 14.95	1.5 1.682	T E	9.9 4.95	0.830 9.900 10.730	120 0.359 0.082		Vel = 2.16	
562			0.0 14.95					30.626		K Factor = 2.70	
543 to 579	21.03 19.59		13.82 13.82	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.624 0.882		Vel = 2.00	
579 to 561	19.59 18.76		0.0 13.82	1.5 1.682	T E	9.9 4.95	0.830 9.900 10.730	120 0.359 0.071		Vel = 2.00	
561			0.0 13.82					30.594		K Factor = 2.50	
544 to 580	21.03 19.59		12.88 12.88	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.624 0.775		Vel = 1.86	
580 to 560	19.59 18.76		0.0 12.88	1.5 1.682	T E	9.9 4.95	0.830 9.900 10.730	120 0.359 0.062		Vel = 1.86	
560			0.0 12.88					30.569		K Factor = 2.33	
545 to 581	21.03 19.59		11.75 11.75	1.5 1.682	T 3E	9.9 14.849	122.010 24.749 146.759	120 0.624 0.717		Vel = 1.70	
581 to 559	19.59 18.76		0.0 11.75	1.5 1.682	T E	9.9 4.95	0.830 9.900 10.730	120 0.359 0.052		Vel = 1.70	
559			0.0 11.75					30.550		K Factor = 2.13	
546 to 582	21.03 19.59		11.60 11.6	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.624 0.638		Vel = 1.67	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
582 to 558	19.59 18.76		0.0 11.6	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0048	30.126 0.359 0.052		Vel = 1.67	
558			0.0 11.60					30.537		K Factor = 2.10	
547 to 592	21.03 20.49		11.36 11.36	1.5 1.682	T 9.9	45.000 9.900 54.900	120 0.0046	28.885 0.234 0.251		Vel = 1.64	
592 to 593	20.49 20.35		0.0 11.36	1.5 1.682		11.000 11.000	120 0.0046	29.370 0.061 0.051		Vel = 1.64	
593 to 594	20.35 20.2		0.0 11.36	1.5 1.682		13.000 13.000	120 0.0045	29.482 0.065 0.059		Vel = 1.64	
594 to 595	20.2 20.04		0.0 11.36	1.5 1.682		12.500 12.500	120 0.0046	29.606 0.069 0.058		Vel = 1.64	
595 to 583	20.04 19.59		0.0 11.36	1.5 1.682	E 4.95	37.500 4.950 42.450	120 0.0046	29.733 0.195 0.194		Vel = 1.64	
583 to 557	19.59 18.76		0.0 11.36	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0047	30.122 0.359 0.050		Vel = 1.64	
557			0.0 11.36					30.531		K Factor = 2.06	
548 to 588	21.03 20.49		11.12 11.12	1.5 1.682	T 9.9	45.000 9.900 54.900	120 0.0044	28.905 0.234 0.242		Vel = 1.61	
588 to 587	20.49 20.35		0.0 11.12	1.5 1.682		11.000 11.000	120 0.0044	29.381 0.061 0.048		Vel = 1.61	
587 to 589	20.35 20.2		0.0 11.12	1.5 1.682		13.000 13.000	120 0.0044	29.490 0.065 0.057		Vel = 1.61	
589 to 590	20.2 20.04		0.0 11.12	1.5 1.682		12.500 12.500	120 0.0045	29.612 0.069 0.056		Vel = 1.61	
590 to 584	20.04 19.59		0.0 11.12	1.5 1.682	E 4.95	37.500 4.950 42.450	120 0.0044	29.737 0.195 0.187		Vel = 1.61	
584 to 556	19.59 18.76		0.0 11.12	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0045	30.119 0.359 0.048		Vel = 1.61	
556			0.0 11.12					30.526		K Factor = 2.01	
549 to 591	21.03 20.04		10.97 10.97	1.5 1.682	T 9.9	81.500 9.900 91.400	120 0.0043	28.918 0.429 0.392		Vel = 1.58	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
591 to 585	20.04 19.59		0.0 10.97	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0043	29.739 0.195 0.182		Vel = 1.58	
585 to 555	19.59 18.76		0.0 10.97	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0044	30.116 0.359 0.047		Vel = 1.58	
555			0.0 10.97						30.522		K Factor = 1.99	
550 to 586	21.03 19.59		10.89	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0042	28.924 0.624 0.567		Vel = 1.57	
586 to 554	19.59 18.76		0.0 10.89	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0043	30.115 0.359 0.046		Vel = 1.57	
554			0.0 10.89						30.520		K Factor = 1.97	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 16
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
527	568	18.660	564	563	74.340
530	565	13.660	605	513	74.430
531	606	44.660	606	514	74.340
527	568	76.160	564	563	16.840
530	565	71.160	605	513	16.930
531	606	102.160	606	514	16.840

Flow		Safety		Pressure
Required		Margin		Differential
Left	69.000	713.762	74.868	-0.012
Left	57.500	713.784	74.856	0.000
Left	46.000	713.795	74.861	-0.005
Left	34.500	713.794	74.883	-0.027
Left	23.000	713.780	74.923	-0.066
Left	11.500	713.753	74.982	-0.126
Area Calculated		713.709	75.063	-0.206
Right	11.500	713.644	75.165	-0.309

Typical Distance Between Heads = 11.500

AutoPeaking Summary

Split Point Used in Worst Area Peaked = 527

Split Point Used in Area Calculated = 527



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS1 SALES 4.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

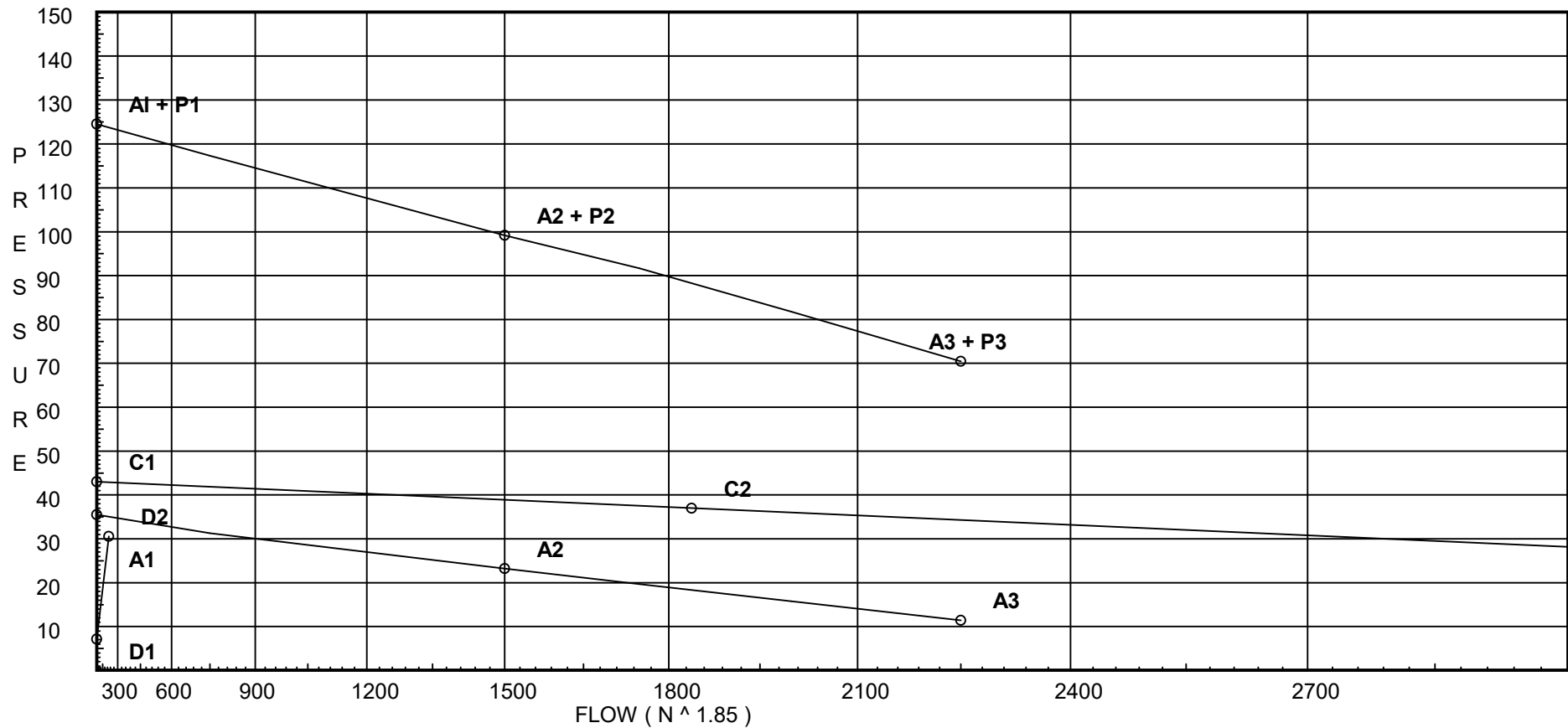
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 7.146
D2 - System Flow : 222.927
D2 - System Pressure : 30.531
Hose (Demand) :
D3 - System Demand : 222.927
Hose (Adj City) : 250
Safety Margin : 92.623



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.154	222.93	30.531
TEST	43.0	37	1839.0	42.514	472.93	42.514

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>	
DP01	14.0	16.8	11.0	55.72	0.01	130
EQ01	14.5		15.55			
101	14.5	14.13	15.55	55.72	K=K @ EQ01	
102	14.5		16.38			
103	14.5		21.49			
104	14.5		21.5			
105	14.5		21.55			
106	14.5		21.6			
107	14.5		21.66			
108	14.5		21.72			
109	14.5		21.79			
110	14.5		21.86			
111	14.5		21.92			
112	14.5		22.0			
113	14.5		22.06			
114	14.5		22.13			
115	14.5		22.2			
134	14.5		22.27			
117	14.5		22.35			
118	14.5		22.42			
119	14.5		22.51			
120	14.5		22.6			
121	14.5		22.71			
122	14.5		22.82			
123	14.5		22.95			
124	14.5		23.09			
125	17.23		22.96			
TR1	17.24		23.32			
BR1	3.58		29.27			
127	2.792		29.61			
128	2.0		29.99			
PO	1.08		30.53			
PI	1.08		34.47			
FLG	-5.0		37.17			
TEST	-2.0		42.51	250.0		
135	14.5	14.13	15.55	55.72	K=K @ EQ01	
162	14.5		16.45			
136	14.5		21.21			
137	14.5		21.23			
138	14.5		21.35			
139	14.5		21.45			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

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>
140	14.5		21.56		
141	14.5		21.65		
142	14.5		21.74		
143	14.5		21.82		
144	14.5		21.9		
145	14.5		21.97		
146	14.5		22.03		
147	14.5		22.09		
148	14.5		22.15		
149	14.5		22.2		
150	14.5		22.24		
151	14.5		22.28		
152	14.5		22.32		
153	14.5		22.34		
154	14.5		22.37		
155	14.5		22.38		
156	14.5		22.39		
157	14.5		22.39		
158	14.5		21.21		
159	14.5		21.21		
160	14.5		21.48		
161	14.5		21.48		
163	14.5		16.47		
164	14.5	14.13	15.56	55.74	K=K @ EQ01
165	14.5	14.13	15.56	55.74	K=K @ EQ01
166	14.5		16.39		
182	14.5		21.46		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
DP01 to EQ01	14 14.5	16.80	55.72 55.72	1 1.049	T 5.0	0.500 5.000 5.500	120 0.8662	11.000 -0.217 4.764		Vel = 20.68	
EQ01			0.0 55.72					15.547		K Factor = 14.13	
101 to 102	14.5 14.5	14.13	54.42	1.5		10.000	120	15.547 0.0		K = K @ EQ01	
102 to 103	14.5 14.5		54.42 0.0	1.682 1.5	T 9.9	10.000 51.500 9.900 61.400	0.0832 120	0.832 16.379 0.0		Vel = 7.86	
103 to 104	14.5 14.5		54.42 14.15	1.682 4		10.000	120	5.107 21.486 0.0		Vel = 7.86	
104 to 105	14.5 14.5		68.57 54.42	4.26 4		10.000 12.000	0.0014 120	0.014 21.500 0.0		Vel = 1.54	
105 to 106	14.5 14.5		122.99 5.92	4.26 4		12.000 11.000	0.0041 120	0.049 21.549 0.0		Vel = 2.77	
106 to 107	14.5 14.5		128.91 5.04	4.26 4		11.000 13.000	0.0045 120	0.049 21.598 0.0		Vel = 2.90	
107 to 108	14.5 14.5		133.95 4.12	4.26 4		13.000 12.500	0.0048 120	0.062 21.660 0.0		Vel = 3.02	
108 to 109	14.5 14.5		138.07 3.39	4.26 4		12.500 12.000	0.0050 120	0.062 21.722 0.0		Vel = 3.11	
109 to 110	14.5 14.5		141.46 2.80	4.26 4		12.000 13.000	0.0053 120	0.064 21.786 0.0		Vel = 3.18	
110 to 111	14.5 14.5		144.26 2.34	4.26 4		13.000 12.000	0.0055 120	0.071 21.857 0.0		Vel = 3.25	
111 to 112	14.5 14.5		146.6 2.08	4.26 4		12.000 13.000	0.0056 120	0.067 21.924 0.0		Vel = 3.30	
112 to 113	14.5 14.5		148.68 2.03	4.26 4		13.000 11.000	0.0058 120	0.076 22.000 0.0		Vel = 3.35	
113 to 114	14.5 14.5		150.71 2.17	4.26 4		11.000 11.000	0.0059 120	0.065 22.065 0.0		Vel = 3.39	
114 to 115	14.5 14.5		152.88 2.48	4.26 4		11.000 11.000	0.0061 120	0.067 22.132 0.0		Vel = 3.44	
115 to 134	14.5 14.5		155.36 2.95	4.26 4		11.000 11.000	0.0063 120	0.069 22.201 0.0		Vel = 3.50	
			158.31	4.26		11.000	0.0065	0.071		Vel = 3.56	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
134 to 117	14.5 14.5		3.52 161.83	4 4.26		11.000 11.000	120 0.0068	22.272 0.0 0.075		Vel = 3.64	
117 to 118	14.5 14.5		4.21 166.04	4 4.26		11.000 11.000	120 0.0071	22.347 0.0 0.078		Vel = 3.74	
118 to 119	14.5 14.5		4.97 171.01	4 4.26		11.330 11.330	120 0.0075	22.425 0.0 0.085		Vel = 3.85	
119 to 120	14.5 14.5		5.86 176.87	4 4.26		12.000 12.000	120 0.0079	22.510 0.0 0.095		Vel = 3.98	
120 to 121	14.5 14.5		6.88 183.75	4 4.26		12.670 12.670	120 0.0086	22.605 0.0 0.109		Vel = 4.14	
121 to 122	14.5 14.5		8.01 191.76	4 4.26		11.000 11.000	120 0.0093	22.714 0.0 0.102		Vel = 4.32	
122 to 123	14.5 14.5		9.07 200.83	4 4.26		13.000 13.000	120 0.0101	22.816 0.0 0.131		Vel = 4.52	
123 to 124	14.5 14.5		10.37 211.2	4 4.26		13.000 13.000	120 0.0110	22.947 0.0 0.143		Vel = 4.75	
124 to 125	14.5 17.23		11.73 222.93	4 4.26	E T 13.167 26.334	46.730 39.501 86.231	120 0.0122	23.090 -1.182 1.055		Vel = 5.02	
125 to TR1	17.23 17.24		0.0 222.93	6 6.357	2E 35.205	174.900 35.205 210.105	120 0.0017	22.963 -0.004 0.365		Vel = 2.25	
TR1 to BR1	17.24 3.58		0.0 222.93	6 6.357	G 3.772	13.660 3.772 17.432	120 0.0018	23.324 5.916 0.031		Vel = 2.25	
BR1 to 127	3.58 2.792		0.0 222.93	6 6.357		0.792 0.792	120 0.0025	29.271 0.341 0.002		Vel = 2.25	
127 to 128	2.792 2		0.0 222.93	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0018	29.614 0.343 0.035		Vel = 2.25	
128 to PO	2 1.080		0.0 222.93	8 8.249	7E T B S 147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0005	29.992 0.398 0.141		Vel = 1.34	
PO			0.0 222.93					30.531		K Factor = 40.35	
System Demand Pressure								30.531			
Safety Margin								92.623			
Continuation Pressure								123.154			

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
Pressure @ Pump Outlet									123.154			
Pressure From Pump Curve									-88.682			
Pressure @ Pump Inlet									34.472			
PI to FLG	1.080 -5		0.0 222.93	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0005	34.472 2.633 0.068		Vel = 1.34	
FLG to TEST	-5 -2		0.0 222.93	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0004	37.173 5.258 0.082		* * Fixed Loss = 6.557 Vel = 1.33	
TEST			250.00 472.93						42.513		Qa = 250.00 K Factor = 72.53	
101 to 135	14.5 14.5		1.30 1.3	1.5 1.682			10.000 10.000	120 0.0001	15.547 0.0 0.001		Vel = 0.19	
135 to 162	14.5 14.5	14.13	55.72	1.5			10.000	120	15.548 0.0		K = K @ EQ01	
162 to 136	14.5 14.5		57.02	1.682			10.000	0.0907	0.907		Vel = 8.23	
162 to 136	14.5 14.5		0.0	1.5	T	9.9	42.500 9.900	120	16.455 0.0			
136 to 137	14.5 14.5		57.02	1.682			52.400	0.0907	4.752		Vel = 8.23	
136 to 137	14.5 14.5		-14.15	3			10.000	120	21.207 0.0			
137 to 138	14.5 14.5		42.87	3.26			10.000	0.0021	0.021		Vel = 1.65	
137 to 138	14.5 14.5		57.07	3			12.000	120	21.228 0.0			
138 to 139	14.5 14.5		99.94	3.26			12.000	0.0102	0.123		Vel = 3.84	
138 to 139	14.5 14.5		-5.92	3			11.000	120	21.351 0.0			
139 to 140	14.5 14.5		94.02	3.26			11.000	0.0091	0.100		Vel = 3.61	
139 to 140	14.5 14.5		-5.04	3			13.000	120	21.451 0.0			
140 to 141	14.5 14.5		88.98	3.26			13.000	0.0082	0.107		Vel = 3.42	
140 to 141	14.5 14.5		-4.13	3			12.500	120	21.558 0.0			
141 to 142	14.5 14.5		84.85	3.26			12.500	0.0075	0.094		Vel = 3.26	
141 to 142	14.5 14.5		-3.38	3			12.000	120	21.652 0.0			
142 to 143	14.5 14.5		81.47	3.26			12.000	0.0070	0.084		Vel = 3.13	
142 to 143	14.5 14.5		-2.80	3			13.000	120	21.736 0.0			
143 to 144	14.5 14.5		78.67	3.26			13.000	0.0066	0.086		Vel = 3.02	
143 to 144	14.5 14.5		-2.34	3			12.000	120	21.822 0.0			
144 to 145	14.5 14.5		76.33	3.26			12.000	0.0062	0.074		Vel = 2.93	
144 to 145	14.5 14.5		-2.08	3			13.000	120	21.896 0.0			
145 to 146	14.5 14.5		74.25	3.26			13.000	0.0058	0.076		Vel = 2.85	
145 to 146	14.5 14.5		-2.03	3			11.000	120	21.972 0.0			
146	14.5		72.22	3.26			11.000	0.0056	0.062		Vel = 2.78	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
146 to 147	14.5 14.5		-2.17 70.05	3 3.26			11.000 11.000	120 0.0053	22.034 0.0 0.058		Vel = 2.69	
147 to 148	14.5 14.5		-2.49 67.56	3 3.26			11.000 11.000	120 0.0050	22.092 0.0 0.055		Vel = 2.60	
148 to 149	14.5 14.5		-2.94 64.62	3 3.26			11.000 11.000	120 0.0045	22.147 0.0 0.050		Vel = 2.48	
149 to 150	14.5 14.5		-3.52 61.1	3 3.26			11.000 11.000	120 0.0041	22.197 0.0 0.045		Vel = 2.35	
150 to 151	14.5 14.5		-4.21 56.89	3 3.26			11.000 11.000	120 0.0035	22.242 0.0 0.039		Vel = 2.19	
151 to 152	14.5 14.5		-4.98 51.91	3 3.26			11.330 11.330	120 0.0031	22.281 0.0 0.035		Vel = 2.00	
152 to 153	14.5 14.5		-5.86 46.05	3 3.26			12.000 12.000	120 0.0024	22.316 0.0 0.029		Vel = 1.77	
153 to 154	14.5 14.5		-6.87 39.18	3 3.26			12.670 12.670	120 0.0018	22.345 0.0 0.023		Vel = 1.51	
154 to 155	14.5 14.5		-8.01 31.17	3 3.26			11.000 11.000	120 0.0012	22.368 0.0 0.013		Vel = 1.20	
155 to 156	14.5 14.5		-9.07 22.1	3 3.26			13.000 13.000	120 0.0006	22.381 0.0 0.008		Vel = 0.85	
156 to 157	14.5 14.5		-10.38 11.72	3 3.26			13.000 13.000	120 0.0002	22.389 0.0 0.003		Vel = 0.45	
157 to 124	14.5 14.5		0.0 11.72	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0049	22.392 0.0 0.698		Vel = 1.69	
124			0.0 11.72						23.090		K Factor = 2.44	
136 to 158	14.5 14.5		14.15 14.15	3 3.26			11.000 11.000	120 0.0003	21.207 0.0 0.003		Vel = 0.54	
158 to 159	14.5 14.5		-7.08 7.07	3 3.26			11.000 11.000	120 0.0001	21.210 0.0 0.001		Vel = 0.27	
159 to 160	14.5 14.5		0.0 7.07	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0019	21.211 0.0 0.274		Vel = 1.02	
160 to 161	14.5 14.5		0.0 7.07	4 4.26			11.000 11.000	120 0	21.485 0.0 0.0		Vel = 0.16	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
161 to 103	14.5 14.5		7.08 14.15	4 4.26			11.000 11.000	120 0.0001	21.485 0.0 0.001		Vel = 0.32	
103			0.0 14.15						21.486		K Factor = 3.05	
158 to 161	14.5 14.5		7.08 7.08	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0019	21.210 0.0 0.275		Vel = 1.02	
161			0.0 7.08						21.485		K Factor = 1.53	
137 to 163	14.5 14.5		-57.07 -57.07	1.5 1.682	T	9.9	42.500 9.900 52.400	120 -0.0908	21.228 0.0 -4.758		Vel = 8.24	
163 to 164	14.5 14.5		0.0 -57.07	1.5 1.682			10.000 10.000	120 -0.0909	16.470 0.0 -0.909		Vel = 8.24	
164 to 165	14.5 14.5	14.13	55.75 -1.32	1.5 1.682			10.000 10.000	120 -0.0001	15.561 0.0 -0.001		K = K @ EQ01 Vel = 0.19	
165 to 166	14.5 14.5	14.13	55.74 54.42	1.5 1.682			10.000 10.000	120 0.0832	15.560 0.0 0.832		K = K @ EQ01 Vel = 7.86	
166 to 104	14.5 14.5		0.0 54.42	1.5 1.682	T	9.9	51.500 9.900 61.400	120 0.0832	16.392 0.0 5.108		Vel = 7.86	
104			0.0 54.42						21.500		K Factor = 11.74	
138 to 182	14.5 14.5		5.92 5.92	1.5 1.682	T	9.9	72.500 9.900 82.400	120 0.0014	21.351 0.0 0.113		Vel = 0.85	
182 to 105	14.5 14.5		0.0 5.92	1.5 1.682	T	9.9	51.500 9.900 61.400	120 0.0014	21.464 0.0 0.085		Vel = 0.85	
105			0.0 5.92						21.549		K Factor = 1.28	
139 to 106	14.5 14.5		5.04 5.04	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0010	21.451 0.0 0.147		Vel = 0.73	
106			0.0 5.04						21.598		K Factor = 1.08	
140 to 107	14.5 14.5		4.13 4.13	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0007	21.558 0.0 0.102		Vel = 0.60	
107			0.0 4.13						21.660		K Factor = 0.89	
141 to 108	14.5 14.5		3.38 3.38	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0005	21.652 0.0 0.070		Vel = 0.49	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
108			0.0 3.38					21.722		K Factor = 0.73	
142 to 109	14.5 14.5		2.80 2.8	1.5 1.682	2T	19.799	120	21.736 0.0		Vel = 0.40	
109			0.0 2.80					21.786		K Factor = 0.60	
143 to 110	14.5 14.5		2.34 2.34	1.5 1.682	2T	19.799	120	21.822 0.0		Vel = 0.34	
110			0.0 2.34					21.857		K Factor = 0.50	
144 to 111	14.5 14.5		2.08 2.08	1.5 1.682	2T	19.799	120	21.896 0.0		Vel = 0.30	
111			0.0 2.08					21.924		K Factor = 0.44	
145 to 112	14.5 14.5		2.03 2.03	1.5 1.682	2T	19.799	120	21.972 0.0		Vel = 0.29	
112			0.0 2.03					22.000		K Factor = 0.43	
146 to 113	14.5 14.5		2.17 2.17	1.5 1.682	2T	19.799	120	22.034 0.0		Vel = 0.31	
113			0.0 2.17					22.065		K Factor = 0.46	
147 to 114	14.5 14.5		2.49 2.49	1.5 1.682	2T	19.799	120	22.092 0.0		Vel = 0.36	
114			0.0 2.49					22.132		K Factor = 0.53	
148 to 115	14.5 14.5		2.94 2.94	1.5 1.682	2T	19.799	120	22.147 0.0		Vel = 0.42	
115			0.0 2.94					22.201		K Factor = 0.62	
149 to 134	14.5 14.5		3.52 3.52	1.5 1.682	2T	19.799	120	22.197 0.0		Vel = 0.51	
134			0.0 3.52					22.272		K Factor = 0.75	
150 to 117	14.5 14.5		4.20 4.2	1.5 1.682	2T	19.799	120	22.242 0.0		Vel = 0.61	
117			0.0 4.20					22.347		K Factor = 0.89	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
151 to 118	14.5 14.5		4.98 4.98	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0010	22.281 0.0 0.144		Vel = 0.72	
118			0.0 4.98					22.425		K Factor = 1.05	
152 to 119	14.5 14.5		5.86 5.86	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0013	22.316 0.0 0.194		Vel = 0.85	
119			0.0 5.86					22.510		K Factor = 1.24	
153 to 120	14.5 14.5		6.87 6.87	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0018	22.345 0.0 0.260		Vel = 0.99	
120			0.0 6.87					22.605		K Factor = 1.44	
154 to 121	14.5 14.5		8.01 8.01	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0024	22.368 0.0 0.346		Vel = 1.16	
121			0.0 8.01					22.714		K Factor = 1.68	
155 to 122	14.5 14.5		9.07 9.07	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0030	22.381 0.0 0.435		Vel = 1.31	
122			0.0 9.07					22.816		K Factor = 1.90	
156 to 123	14.5 14.5		10.38 10.38	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0039	22.389 0.0 0.558		Vel = 1.50	
123			0.0 10.38					22.947		K Factor = 2.17	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS1 SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

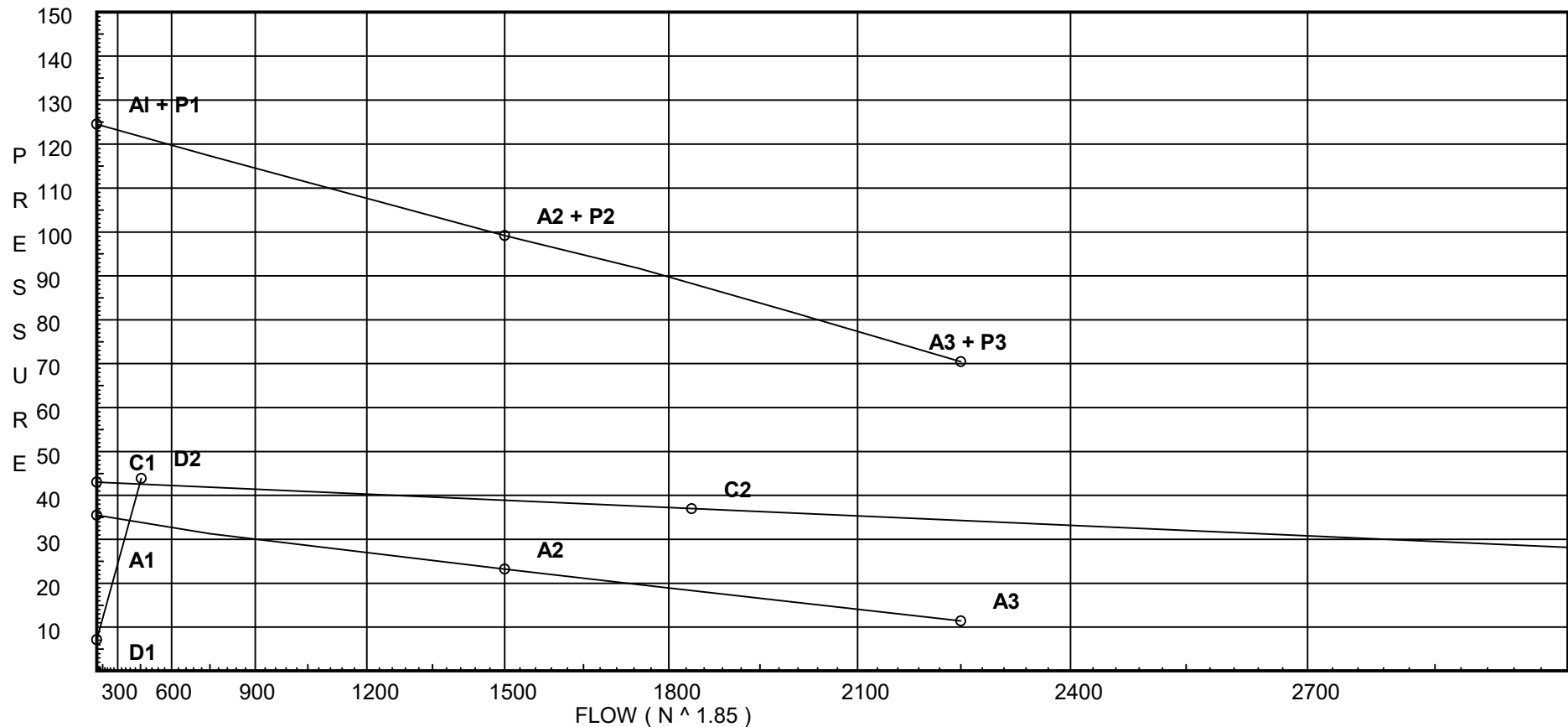
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 7.146
D2 - System Flow : 453.955
D2 - System Pressure : 43.866
Hose (Demand) :
D3 - System Demand : 453.955
Hose (Adj City) : 250
Safety Margin : 77.039



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.905	453.96	43.866
TEST	43.0	37	1839.0	41.985	703.96	41.985

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>
DP01	14.0	16.8	8.0	47.52	0.01 130
EQ01	14.5		11.33		
101	14.5	14.12	11.33	47.52	K=K @ EQ01
102	14.5	14.12	11.93	48.76	K=K @ EQ01
103	14.5		26.09		
104	14.5		26.13		
105	14.5		26.27		
106	14.5		26.45		
107	14.5		26.67		
108	14.5		26.9		
109	14.5		27.13		
110	14.5		27.4		
111	14.5		27.65		
112	14.5		27.92		
113	14.5		28.17		
114	14.5		28.42		
115	14.5		28.67		
134	14.5		28.94		
117	14.5		29.21		
118	14.5		29.5		
119	14.5		29.82		
120	14.5		30.18		
121	14.5		30.58		
122	14.5		30.96		
123	14.5		31.45		
124	14.5		31.99		
125	17.23		34.74		
TR1	17.24		36.09		
BR1	3.58		42.12		
127	2.792		42.47		
128	2.0		42.94		
PO	1.08		43.87		
PI	1.08		33.09		
FLG	-5.0		35.98		
TEST	-2.0		41.98	250.0	
135	14.5	14.12	11.33	47.52	K=K @ EQ01
162	14.5	14.12	12.03	48.96	K=K @ EQ01
136	14.5		25.05		
137	14.5		25.1		
138	14.5		25.42		
139	14.5		25.81		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

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>
140	14.5		26.23		
141	14.5		26.59		
142	14.5		26.91		
143	14.5		27.24		
144	14.5		27.52		
145	14.5		27.81		
146	14.5		28.04		
147	14.5		28.26		
148	14.5		28.46		
149	14.5		28.65		
150	14.5		28.82		
151	14.5		28.97		
152	14.5		29.1		
153	14.5		29.2		
154	14.5		29.29		
155	14.5		29.34		
156	14.5		29.37		
157	14.5		29.38		
158	14.5		25.06		
159	14.5		25.06		
160	14.5		26.09		
161	14.5		26.09		
163	14.5	14.12	12.05	49.0	K=K @ EQ01
164	14.5	14.12	11.36	47.57	K=K @ EQ01
165	14.5	14.12	11.35	47.56	K=K @ EQ01
166	14.5	14.12	11.96	48.81	K=K @ EQ01
182	14.5	14.12	23.38	68.26	K=K @ EQ01

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
DP01 to EQ01	14 14.5	16.80	47.52 47.52	1 1.049	T 5.0	0.500 5.000 5.500	120 0.6453	8.000 -0.217 3.549			
			0.0						Vel =	17.64	
EQ01			47.52					11.332		K Factor =	14.12
101 to 102	14.5 14.5	14.12	45.66	1.5		10.000	120	11.332 0.0		K = K @ EQ01	
			45.66	1.682		10.000	0.0601	0.601		Vel =	6.59
102 to 103	14.5 14.5	14.12	48.76	1.5	T 9.9	51.500 9.900 61.400	120	11.933 0.0		K = K @ EQ01	
			94.42	1.682			0.2306	14.157		Vel =	13.63
103 to 104	14.5 14.5		28.82	4		10.000	120	26.090 0.0			
			123.24	4.26		10.000	0.0041	0.041		Vel =	2.77
104 to 105	14.5 14.5		94.49	4		12.000	120	26.131 0.0			
			217.73	4.26		12.000	0.0117	0.140		Vel =	4.90
105 to 106	14.5 14.5		39.99	4		11.000	120	26.271 0.0			
			257.72	4.26		11.000	0.0160	0.176		Vel =	5.80
106 to 107	14.5 14.5		11.12	4		13.000	120	26.447 0.0			
			268.84	4.26		13.000	0.0173	0.225		Vel =	6.05
107 to 108	14.5 14.5		9.16	4		12.500	120	26.672 0.0			
			278.0	4.26		12.500	0.0184	0.230		Vel =	6.26
108 to 109	14.5 14.5		7.56	4		12.000	120	26.902 0.0			
			285.56	4.26		12.000	0.0193	0.232		Vel =	6.43
109 to 110	14.5 14.5		6.29	4		13.000	120	27.134 0.0			
			291.85	4.26		13.000	0.0202	0.262		Vel =	6.57
110 to 111	14.5 14.5		5.24	4		12.000	120	27.396 0.0			
			297.09	4.26		12.000	0.0208	0.250		Vel =	6.69
111 to 112	14.5 14.5		4.64	4		13.000	120	27.646 0.0			
			301.73	4.26		13.000	0.0214	0.278		Vel =	6.79
112 to 113	14.5 14.5		4.41	4		11.000	120	27.924 0.0			
			306.14	4.26		11.000	0.0220	0.242		Vel =	6.89
113 to 114	14.5 14.5		4.64	4		11.000	120	28.166 0.0			
			310.78	4.26		11.000	0.0226	0.249		Vel =	7.00
114 to 115	14.5 14.5		5.21	4		11.000	120	28.415 0.0			
			315.99	4.26		11.000	0.0233	0.256		Vel =	7.11
115 to 134	14.5 14.5		6.10	4		11.000	120	28.671 0.0			
			322.09	4.26		11.000	0.0242	0.266		Vel =	7.25

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
134 to 117	14.5 14.5		7.25 329.34	4 4.26		11.000 11.000	120 0.0252	28.937 0.0 0.277		Vel = 7.41	
117 to 118	14.5 14.5		8.61 337.95	4 4.26		11.000 11.000	120 0.0265	29.214 0.0 0.291		Vel = 7.61	
118 to 119	14.5 14.5		10.18 348.13	4 4.26		11.330 11.330	120 0.0279	29.505 0.0 0.316		Vel = 7.84	
119 to 120	14.5 14.5		11.96 360.09	4 4.26		12.000 12.000	120 0.0297	29.821 0.0 0.356		Vel = 8.11	
120 to 121	14.5 14.5		14.02 374.11	4 4.26		12.670 12.670	120 0.0319	30.177 0.0 0.404		Vel = 8.42	
121 to 122	14.5 14.5		16.33 390.44	4 4.26		11.000 11.000	120 0.0345	30.581 0.0 0.380		Vel = 8.79	
122 to 123	14.5 14.5		18.49 408.93	4 4.26		13.000 13.000	120 0.0375	30.961 0.0 0.488		Vel = 9.20	
123 to 124	14.5 14.5		21.14 430.07	4 4.26		13.000 13.000	120 0.0413	31.449 0.0 0.537		Vel = 9.68	
124 to 125	14.5 17.23		23.89 453.96	4 4.26	E T 13.167 26.334	46.730 39.501 86.231	120 0.0456	31.986 -1.182 3.931		Vel = 10.22	
125 to TR1	17.23 17.24		0.0 453.96	6 6.357	2E 35.205	174.900 35.205 210.105	120 0.0065	34.735 -0.004 1.363		Vel = 4.59	
TR1 to BR1	17.24 3.58		0.0 453.96	6 6.357	G 3.772	13.660 3.772 17.432	120 0.0065	36.094 5.916 0.113		Vel = 4.59	
BR1 to 127	3.58 2.792		0.0 453.96	6 6.357		0.792 0.792	120 0.0076	42.123 0.341 0.006		Vel = 4.59	
127 to 128	2.792 2		0.0 453.96	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0065	42.470 0.343 0.129		Vel = 4.59	
128 to PO	2 1.080		0.0 453.96	8 8.249	7E T B S 147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0018	42.942 0.398 0.526		Vel = 2.73	
PO			0.0 453.96					43.866		K Factor = 68.54	
System Demand Pressure								43.866			
Safety Margin								77.039			
Continuation Pressure								120.905			

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
Pressure @ Pump Outlet									120.905			
Pressure From Pump Curve									-87.815			
Pressure @ Pump Inlet									33.090			
PI to FLG	1.080 -5		0.0 453.96	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0018	33.090 2.633 0.254		Vel = 2.73	
FLG to TEST	-5 -2		0.0 453.96	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0014	35.977 5.701 0.307		* * Fixed Loss = 7 Vel = 2.71	
TEST			250.00 703.96						41.985		Qa = 250.00 K Factor = 108.64	
101 to 135	14.5 14.5		1.85 1.85	1.5 1.682			10.000 10.000	120 0.0001	11.332 0.0 0.001		Vel = 0.27	
135 to 162	14.5 14.5	14.12	47.53 49.38	1.5 1.682			10.000 10.000	120 0.0695	11.333 0.0 0.695		K = K @ EQ01 Vel = 7.13	
162 to 136	14.5 14.5	14.12	48.95 98.33	1.5 1.682	T	9.9	42.500 9.900 52.400	120 0.2485	12.028 0.0 13.022		K = K @ EQ01 Vel = 14.20	
136 to 137	14.5 14.5		-28.81 69.52	3 3.26			10.000 10.000	120 0.0053	25.050 0.0 0.053		Vel = 2.67	
137 to 138	14.5 14.5		98.45 167.97	3 3.26			12.000 12.000	120 0.0267	25.103 0.0 0.320		Vel = 6.46	
138 to 139	14.5 14.5		28.27 196.24	3 3.26			11.000 11.000	120 0.0355	25.423 0.0 0.391		Vel = 7.54	
139 to 140	14.5 14.5		-11.12 185.12	3 3.26			13.000 13.000	120 0.0319	25.814 0.0 0.415		Vel = 7.12	
140 to 141	14.5 14.5		-9.17 175.95	3 3.26			12.500 12.500	120 0.0290	26.229 0.0 0.363		Vel = 6.76	
141 to 142	14.5 14.5		-7.55 168.4	3 3.26			12.000 12.000	120 0.0268	26.592 0.0 0.322		Vel = 6.47	
142 to 143	14.5 14.5		-6.29 162.11	3 3.26			13.000 13.000	120 0.0249	26.914 0.0 0.324		Vel = 6.23	
143 to 144	14.5 14.5		-5.25 156.86	3 3.26			12.000 12.000	120 0.0235	27.238 0.0 0.282		Vel = 6.03	
144 to 145	14.5 14.5		-4.63 152.23	3 3.26			13.000 13.000	120 0.0222	27.520 0.0 0.289		Vel = 5.85	
145 to 146	14.5 14.5		-4.42 147.81	3 3.26			11.000 11.000	120 0.0211	27.809 0.0 0.232		Vel = 5.68	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
146 to 147	14.5 14.5		-4.63 143.18	3 3.26			11.000 11.000	120 0.0198	28.041 0.0 0.218		Vel = 5.50	
147 to 148	14.5 14.5		-5.21 137.97	3 3.26			11.000 11.000	120 0.0185	28.259 0.0 0.204		Vel = 5.30	
148 to 149	14.5 14.5		-6.10 131.87	3 3.26			11.000 11.000	120 0.0170	28.463 0.0 0.187		Vel = 5.07	
149 to 150	14.5 14.5		-7.25 124.62	3 3.26			11.000 11.000	120 0.0154	28.650 0.0 0.169		Vel = 4.79	
150 to 151	14.5 14.5		-8.62 116.0	3 3.26			11.000 11.000	120 0.0135	28.819 0.0 0.148		Vel = 4.46	
151 to 152	14.5 14.5		-10.17 105.83	3 3.26			11.330 11.330	120 0.0113	28.967 0.0 0.128		Vel = 4.07	
152 to 153	14.5 14.5		-11.96 93.87	3 3.26			12.000 12.000	120 0.0091	29.095 0.0 0.109		Vel = 3.61	
153 to 154	14.5 14.5		-14.02 79.85	3 3.26			12.670 12.670	120 0.0068	29.204 0.0 0.086		Vel = 3.07	
154 to 155	14.5 14.5		-16.34 63.51	3 3.26			11.000 11.000	120 0.0044	29.290 0.0 0.048		Vel = 2.44	
155 to 156	14.5 14.5		-18.48 45.03	3 3.26			13.000 13.000	120 0.0024	29.338 0.0 0.031		Vel = 1.73	
156 to 157	14.5 14.5		-21.14 23.89	3 3.26			13.000 13.000	120 0.0007	29.369 0.0 0.009		Vel = 0.92	
157 to 124	14.5 14.5		0.0 23.89	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0181	29.378 0.0 2.608		Vel = 3.45	
124			0.0 23.89						31.986		K Factor = 4.22	
136 to 158	14.5 14.5		28.81 28.81	3 3.26			11.000 11.000	120 0.0011	25.050 0.0 0.012		Vel = 1.11	
158 to 159	14.5 14.5		-14.42 14.39	3 3.26			11.000 11.000	120 0.0003	25.062 0.0 0.003		Vel = 0.55	
159 to 160	14.5 14.5		0.0 14.39	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0071	25.065 0.0 1.021		Vel = 2.08	
160 to 161	14.5 14.5		0.0 14.39	4 4.26			11.000 11.000	120 0.0001	26.086 0.0 0.001		Vel = 0.32	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
161 to 103	14.5 14.5		14.42 28.81	4 4.26			11.000 11.000	120 0.0003	26.087 0.0 0.003		Vel = 0.65	
103			0.0 28.81						26.090		K Factor = 5.64	
158 to 161	14.5 14.5		14.42 14.42	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0071	25.062 0.0 1.025		Vel = 2.08	
161			0.0 14.42						26.087		K Factor = 2.82	
137 to 163	14.5 14.5		-98.45 -98.45	1.5 1.682	T	9.9	42.500 9.900 52.400	120 -0.2491	25.103 0.0 -13.051		Vel = 14.22	
163 to 164	14.5 14.5	14.12	49.01 -49.44	1.5 1.682			10.000 10.000	120 -0.0697	12.052 0.0 -0.697		K = K @ EQ01 Vel = 7.14	
164 to 165	14.5 14.5	14.12	47.56 -1.88	1.5 1.682			10.000 10.000	120 -0.0002	11.355 0.0 -0.002		K = K @ EQ01 Vel = 0.27	
165 to 166	14.5 14.5	14.12	47.56 45.68	1.5 1.682			10.000 10.000	120 0.0602	11.353 0.0 0.602		K = K @ EQ01 Vel = 6.60	
166 to 104	14.5 14.5	14.12	48.81 94.49	1.5 1.682	T	9.9	51.500 9.900 61.400	120 0.2309	11.955 0.0 14.176		K = K @ EQ01 Vel = 13.64	
104			0.0 94.49						26.131		K Factor = 18.48	
138 to 182	14.5 14.5		-28.27 -28.27	1.5 1.682	T	9.9	72.500 9.900 82.400	120 -0.0248	25.423 0.0 -2.041		Vel = 4.08	
182 to 105	14.5 14.5	14.12	68.26 39.99	1.5 1.682	T	9.9	51.500 9.900 61.400	120 0.0471	23.382 0.0 2.889		K = K @ EQ01 Vel = 5.77	
105			0.0 39.99						26.271		K Factor = 7.80	
139 to 106	14.5 14.5		11.12 11.12	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0044	25.814 0.0 0.633		Vel = 1.61	
106			0.0 11.12						26.447		K Factor = 2.16	
140 to 107	14.5 14.5		9.17 9.17	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0031	26.229 0.0 0.443		Vel = 1.32	
107			0.0 9.17						26.672		K Factor = 1.78	
141 to 108	14.5 14.5		7.56 7.56	1.5 1.682	2T	19.799	124.000 19.799 143.799	120 0.0022	26.592 0.0 0.310		Vel = 1.09	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
108			0.0 7.56					26.902		K Factor = 1.46	
142 to 109	14.5 14.5		6.29 6.29	1.5 1.682	2T	19.799	120	26.914 0.0		Vel = 0.91	
109			0.0 6.29					27.134		K Factor = 1.21	
143 to 110	14.5 14.5		5.24 5.24	1.5 1.682	2T	19.799	120	27.238 0.0		Vel = 0.76	
110			0.0 5.24					27.396		K Factor = 1.00	
144 to 111	14.5 14.5		4.64 4.64	1.5 1.682	2T	19.799	120	27.520 0.0		Vel = 0.67	
111			0.0 4.64					27.646		K Factor = 0.88	
145 to 112	14.5 14.5		4.42 4.42	1.5 1.682	2T	19.799	120	27.809 0.0		Vel = 0.64	
112			0.0 4.42					27.924		K Factor = 0.84	
146 to 113	14.5 14.5		4.63 4.63	1.5 1.682	2T	19.799	120	28.041 0.0		Vel = 0.67	
113			0.0 4.63					28.166		K Factor = 0.87	
147 to 114	14.5 14.5		5.21 5.21	1.5 1.682	2T	19.799	120	28.259 0.0		Vel = 0.75	
114			0.0 5.21					28.415		K Factor = 0.98	
148 to 115	14.5 14.5		6.10 6.1	1.5 1.682	2T	19.799	120	28.463 0.0		Vel = 0.88	
115			0.0 6.10					28.671		K Factor = 1.14	
149 to 134	14.5 14.5		7.25 7.25	1.5 1.682	2T	19.799	120	28.650 0.0		Vel = 1.05	
134			0.0 7.25					28.937		K Factor = 1.35	
150 to 117	14.5 14.5		8.61 8.61	1.5 1.682	2T	19.799	120	28.819 0.0		Vel = 1.24	
117			0.0 8.61					29.214		K Factor = 1.59	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
151 to 118	14.5 14.5		10.18 10.18	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0037	28.967 0.0 0.538		Vel = 1.47	
118			0.0 10.18					29.505		K Factor = 1.87	
152 to 119	14.5 14.5		11.96 11.96	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0050	29.095 0.0 0.726		Vel = 1.73	
119			0.0 11.96					29.821		K Factor = 2.19	
153 to 120	14.5 14.5		14.02 14.02	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0068	29.204 0.0 0.973		Vel = 2.02	
120			0.0 14.02					30.177		K Factor = 2.55	
154 to 121	14.5 14.5		16.34 16.34	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0090	29.290 0.0 1.291		Vel = 2.36	
121			0.0 16.34					30.581		K Factor = 2.95	
155 to 122	14.5 14.5		18.48 18.48	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0113	29.338 0.0 1.623		Vel = 2.67	
122			0.0 18.48					30.961		K Factor = 3.32	
156 to 123	14.5 14.5		21.14 21.14	1.5 1.682	2T 19.799	124.000 19.799 143.799	120 0.0145	29.369 0.0 2.080		Vel = 3.05	
123			0.0 21.14					31.449		K Factor = 3.77	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
102	103	51.500	162	136	42.500
166	104	51.500	137	163	42.500
182	105	51.500	138	182	72.500

Flow		Safety		Pressure
Required		Margin		Differential
Left	10.000	704.186	77.147	-0.108
Area Calculated		703.955	77.039	0.000
Right	10.000	703.670	77.421	-0.382

Typical Distance Between Heads = 10.000

Split Point Used in Worst Area Peaked = 101



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS1 STOCK 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

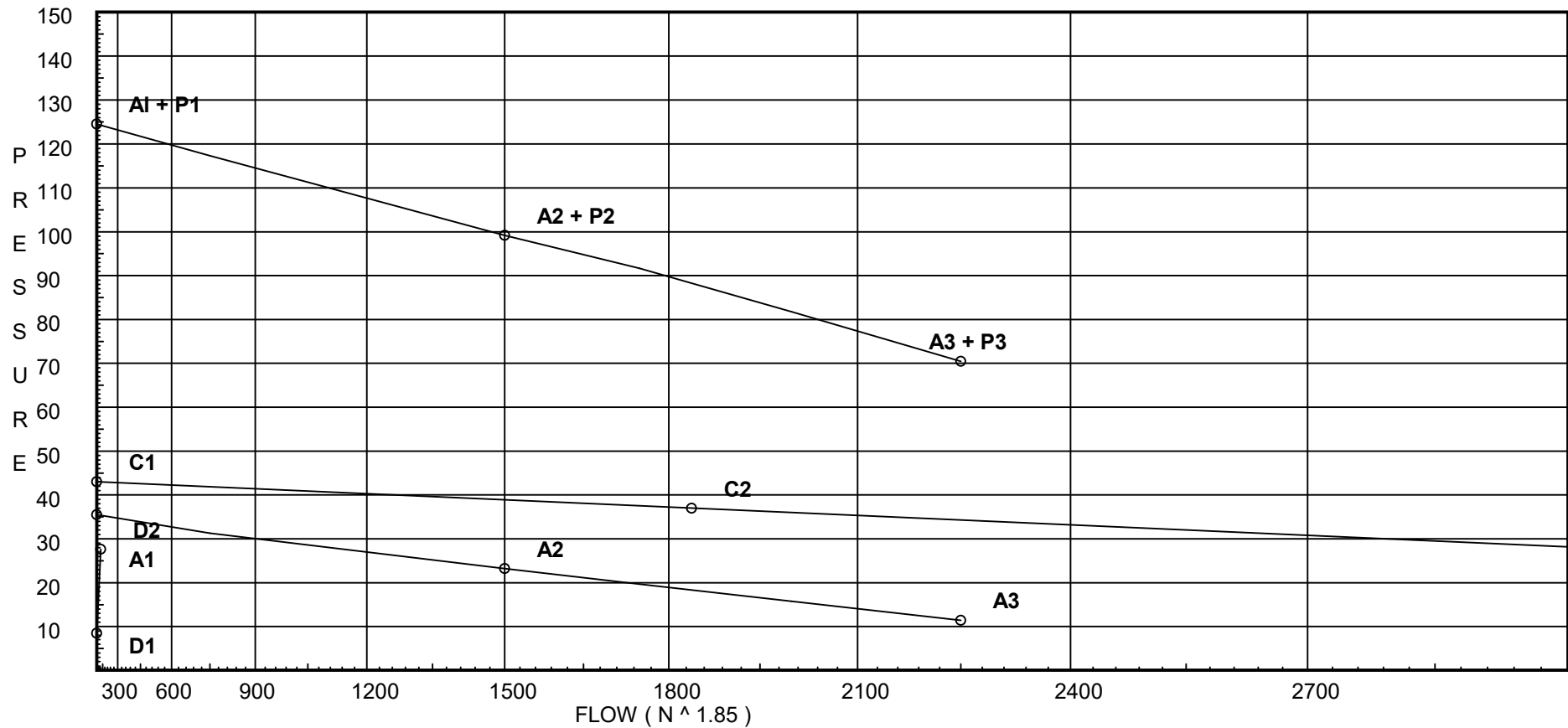
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.506
D2 - System Flow : 121.278
D2 - System Pressure : 27.611
Hose (Demand) :
D3 - System Demand : 121.278
Hose (Adj City) : 250
Safety Margin : 96.290



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.901	121.28	27.611
TEST	43.0	37	1839.0	42.689	371.28	42.689

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>	
167	17.64	16.8	12.0	58.2	0.01	100
168	17.64	16.8	14.1	63.08	0.01	100
169	17.64		17.95			
170	17.64		20.17			
171	17.52		20.23			
172	17.4		20.28			
125	17.23		20.43			
TR1	17.24		20.54			
BR1	3.58		26.47			
127	2.792		26.81			
128	2.0		27.17			
PO	1.08		27.61			
PI	1.08		35.0			
FLG	-5.0		37.66			
TEST	-2.0		42.69	250.0		
173	17.64		20.17			
174	17.52		20.23			
175	17.52		20.23			
176	17.52		20.23			
177	17.52		20.23			
178	17.4		20.28			
179	17.4		20.28			
180	17.4		20.28			
181	17.4		20.28			

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

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	*****
167 to 168	17.64 17.64	16.80	58.20 58.2	1.25 1.38			8.500 8.500	120 0.2469	12.000 2.099		Vel = 12.48	
168 to 169	17.64 17.64	16.80	63.08 121.28	1.5 1.61			8.500 8.500	120 0.4533	14.099 3.853		Vel = 19.11	
169 to 170	17.64 17.64		0.0 121.28	2 2.067	T	10.0	6.500 10.000 16.500	120 0.1342	17.952 0.0 2.215		Vel = 11.60	
170 to 171	17.64 17.52		0.0 121.28	6 6.357			10.000 10.000	120 0.0006	20.167 0.052 0.006		Vel = 1.23	
171 to 172	17.52 17.4		0.0 121.28	6 6.357			10.000 10.000	120 0.0005	20.225 0.052 0.005		Vel = 1.23	
172 to 125	17.4 17.23		0.0 121.28	6 6.357	E	17.603	113.710 17.603 131.313	120 0.0006	20.282 0.074 0.074		Vel = 1.23	
125 to TR1	17.23 17.24		0.0 121.28	6 6.357	2E	35.205	174.900 35.205 210.105	120 0.0006	20.430 -0.004 0.118		Vel = 1.23	
TR1 to BR1	17.24 3.58		0.0 121.28	6 6.357	G	3.772	13.660 3.772 17.432	120 0.0006	20.544 5.916 0.010		Vel = 1.23	
BR1 to 127	3.58 2.792		0.0 121.28	6 6.357			0.792 0.792	120 0.0013	26.470 0.341 0.001		Vel = 1.23	
127 to 128	2.792 2		0.0 121.28	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0006	26.812 0.343 0.011		Vel = 1.23	
128 to PO	2 1.080		0.0 121.28	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0002	27.166 0.398 0.047		Vel = 0.73	
PO			0.0 121.28						27.611		K Factor = 23.08	
System Demand Pressure									27.611			
Safety Margin									96.290			
Continuation Pressure									123.901			
Pressure @ Pump Outlet									123.901			
Pressure From Pump Curve									-88.897			
Pressure @ Pump Inlet									35.004			
PI to FLG	1.080 -5		0.0 121.28	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0002	35.004 2.633 0.021		Vel = 0.73	
FLG to TEST	-5 -2		0.0 121.28	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0001	37.658 5.004 0.028		* * Fixed Loss = 6.303 Vel = 0.72	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
										Qa = 250.00 K Factor = 56.82		
TEST			250.00 371.28						42.690			
173 to 170	17.64 17.64	.0	0.0	2	T	10.0	2.000 10.000 12.000	120	20.167 0.0 0.0	Vel = 0		
170			0.0 0.0						20.167	K Factor = 0		
174 to 175	17.52 17.52	.0	0.0	1.25			8.500 8.500	120	20.225 0.0 0.0	Vel = 0		
175 to 176	17.52 17.52	.0	0.0	1.5			8.500 8.500	120	20.225 0.0 0.0	Vel = 0		
176 to 171	17.52 17.52	.0	0.0	2	T	10.0	6.500 10.000 16.500	120	20.225 0.0 0.0	Vel = 0		
171			0.0 0.0						20.225	K Factor = 0		
177 to 171	17.52 17.52	.0	0.0	2	T	10.0	2.000 10.000 12.000	120	20.225 0.0 0.0	Vel = 0		
171			0.0 0.0						20.225	K Factor = 0		
178 to 179	17.4 17.4	.0	0.0	1.25			8.500 8.500	120	20.282 0.0 0.0	Vel = 0		
179 to 180	17.4 17.4	.0	0.0	1.5			8.500 8.500	120	20.282 0.0 0.0	Vel = 0		
180 to 172	17.4 17.4	.0	0.0	2	T	10.0	6.500 10.000 16.500	120	20.282 0.0 0.0	Vel = 0		
172			0.0 0.0						20.282	K Factor = 0		
181 to 172	17.4 17.4	.0	0.0	2	T	10.0	2.000 10.000 12.000	120	20.282 0.0 0.0	Vel = 0		
172			0.0 0.0						20.282	K Factor = 0		



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS1 STOCK 12.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

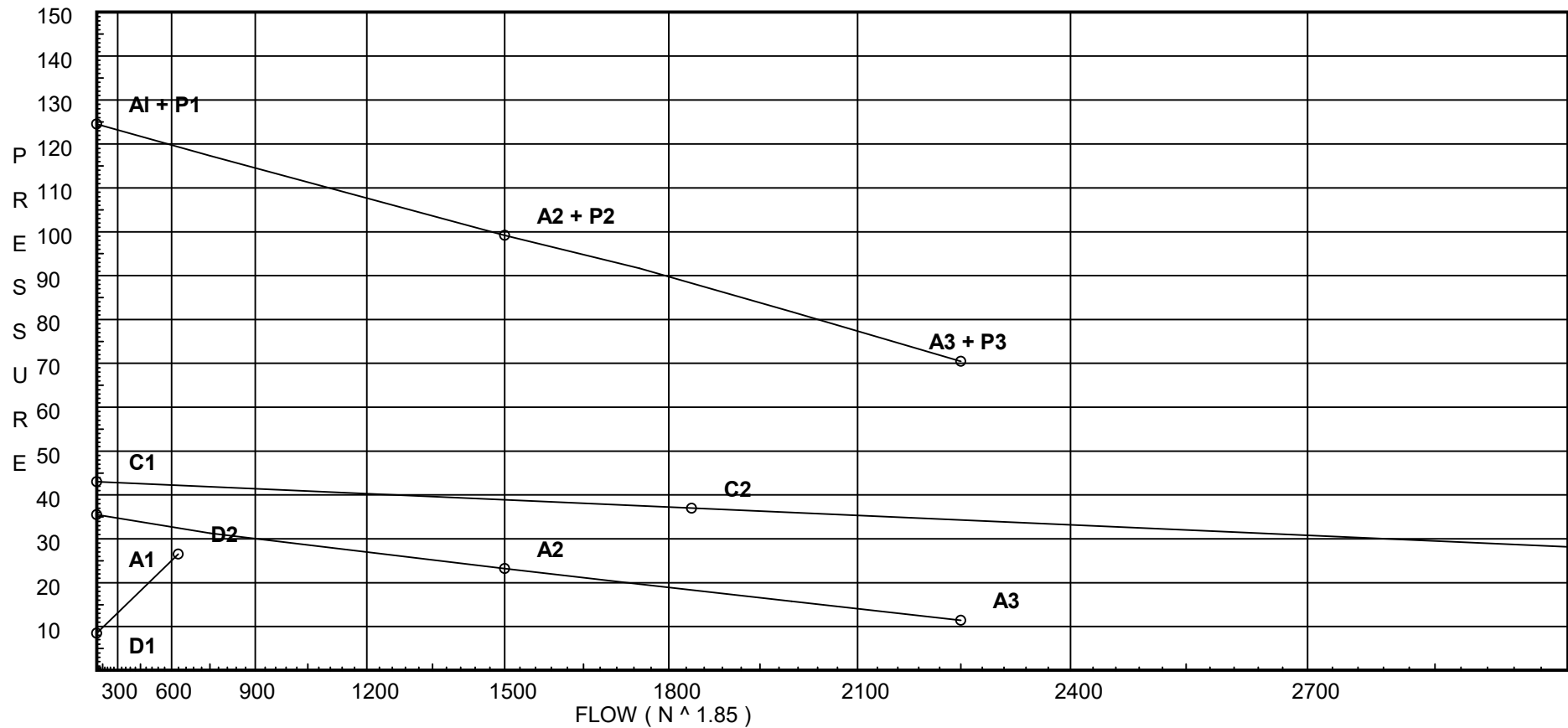
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.506
D2 - System Flow : 628.591
D2 - System Pressure : 26.507
Hose (Demand) :
D3 - System Demand : 628.591
Hose (Adj City) : 250
Safety Margin : 92.442



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			118.949	628.59	26.507
TEST	43.0	37	1839.0	41.47	878.59	41.47

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>	
167	17.64	16.8	7.0	44.45	0.01	100
168	17.64	16.8	8.28	48.33	0.01	100
169	17.64	16.8	10.62	54.75	0.01	100
170	17.64		13.8			
171	17.52		13.87			
172	17.4		13.98			
125	17.23		15.61			
TR1	17.24		18.1			
BR1	3.58		24.22			
127	2.792		24.57			
128	2.0		25.15			
PO	1.08		26.51			
PI	1.08		32.11			
FLG	-5.0		35.21			
TEST	-2.0		41.47	250.0		
173	17.64	16.8	13.35	61.38	0.01	100
174	17.52	16.8	7.04	44.56	0.01	100
175	17.52	16.8	8.32	48.45	0.01	100
176	17.52	16.8	10.68	54.89	0.01	100
177	17.52	16.8	13.41	61.53	0.01	100
178	17.4	16.8	7.09	44.74	0.01	100
179	17.4	16.8	8.38	48.64	0.01	100
180	17.4	16.8	10.76	55.11	0.01	100
181	17.4	16.8	13.52	61.77	0.01	100

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

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	*****
167 to 168	17.64 17.64	16.80	44.45 44.45	1.25 1.38			8.500 8.500	120 0.1500	7.000 1.275		Vel = 9.53	
168 to 169	17.64 17.64	16.80	48.33 92.78	1.5 1.61			8.500 8.500	120 0.2761	8.275 2.347		Vel = 14.62	
169 to 170	17.64 17.64	16.80	54.75 147.53	2 2.067	T	10.0	6.500 10.000 16.500	120 0.1929	10.622 0.0 3.183		Vel = 14.11	
170 to 171	17.64 17.52		61.38 208.91	6 6.357			10.000 10.000	120 0.0015	13.805 0.052 0.015		Vel = 2.11	
171 to 172	17.52 17.4		209.43 418.34	6 6.357			10.000 10.000	120 0.0056	13.872 0.052 0.056		Vel = 4.23	
172 to 125	17.4 17.23		210.25 628.59	6 6.357	E	17.603	113.710 17.603 131.313	120 0.0118	13.980 0.074 1.556		Vel = 6.35	
125 to TR1	17.23 17.24		0.0 628.59	6 6.357	2E	35.205	174.900 35.205 210.105	120 0.0119	15.610 -0.004 2.490		Vel = 6.35	
TR1 to BR1	17.24 3.58		0.0 628.59	6 6.357	G	3.772	13.660 3.772 17.432	120 0.0119	18.096 5.916 0.207		Vel = 6.35	
BR1 to 127	3.58 2.792		0.0 628.59	6 6.357			0.792 0.792	120 0.0126	24.219 0.341 0.010		Vel = 6.35	
127 to 128	2.792 2		0.0 628.59	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0118	24.570 0.343 0.236		Vel = 6.35	
128 to PO	2 1.080		0.0 628.59	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0033	25.149 0.398 0.960		Vel = 3.77	
PO			0.0 628.59						26.507		K Factor = 122.09	
System Demand Pressure									26.507			
Safety Margin									92.442			
Continuation Pressure									118.949			
Pressure @ Pump Outlet									118.949			
Pressure From Pump Curve									-86.836			
Pressure @ Pump Inlet									32.113			
PI to FLG	1.080 -5		0.0 628.59	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0033	32.113 2.633 0.464		Vel = 3.77	
FLG to TEST	-5 -2		0.0 628.59	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0025	35.210 5.701 0.559		* * Fixed Loss = 7 Vel = 3.75	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
TEST			250.00 878.59					41.470		Qa = 250.00 K Factor = 136.43	
173 to 170	17.64 17.64	16.80	61.38	2	T 10.0	2.000 10.000 12.000	120	13.348 0.0			
			61.38	2.067			0.0381	0.457		Vel = 5.87	
170			0.0 61.38					13.805		K Factor = 16.52	
174 to 175	17.52 17.52	16.80	44.56	1.25		8.500	120	7.036 0.0			
			44.56	1.38		8.500	0.1506	1.280		Vel = 9.56	
175 to 176	17.52 17.52	16.80	48.45	1.5		8.500	120	8.316 0.0			
			93.01	1.61		8.500	0.2775	2.359		Vel = 14.66	
176 to 171	17.52 17.52	16.80	54.89	2	T 10.0	6.500 10.000 16.500	120	10.675 0.0			
			147.9	2.067			0.1938	3.197		Vel = 14.14	
171			0.0 147.90					13.872		K Factor = 39.71	
177 to 171	17.52 17.52	16.80	61.53	2	T 10.0	2.000 10.000 12.000	120	13.413 0.0			
			61.53	2.067			0.0382	0.459		Vel = 5.88	
171			0.0 61.53					13.872		K Factor = 16.52	
178 to 179	17.4 17.4	16.80	44.74	1.25		8.500	120	7.093 0.0			
			44.74	1.38		8.500	0.1518	1.290		Vel = 9.60	
179 to 180	17.4 17.4	16.80	48.64	1.5		8.500	120	8.383 0.0			
			93.38	1.61		8.500	0.2795	2.376		Vel = 14.72	
180 to 172	17.4 17.4	16.80	55.11	2	T 10.0	6.500 10.000 16.500	120	10.759 0.0			
			148.49	2.067			0.1952	3.221		Vel = 14.20	
172			0.0 148.49					13.980		K Factor = 39.71	
181 to 172	17.4 17.4	16.80	61.77	2	T 10.0	2.000 10.000 12.000	120	13.518 0.0			
			61.77	2.067			0.0385	0.462		Vel = 5.91	
172			0.0 61.77					13.980		K Factor = 16.52	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS2 SALES 4.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

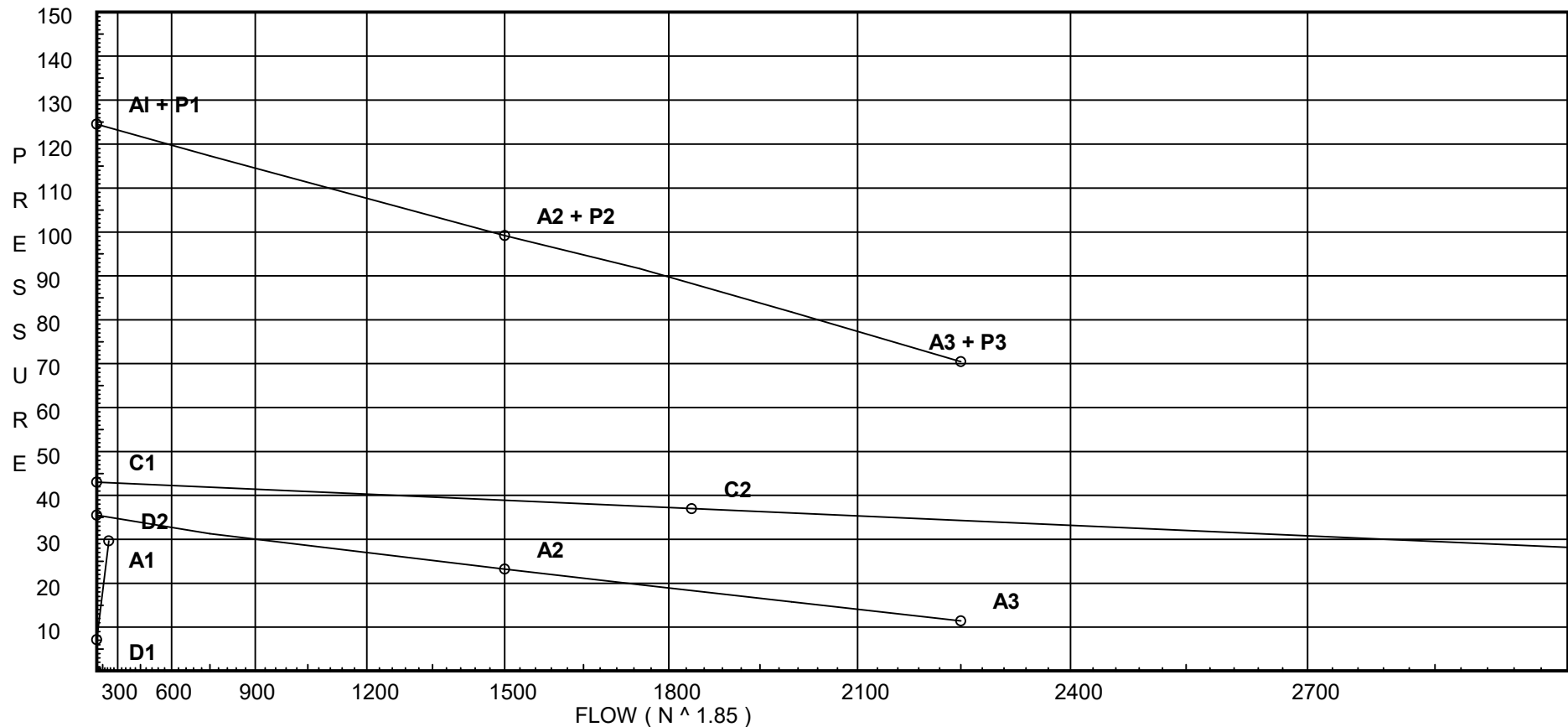
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 7.146
D2 - System Flow : 222.889
D2 - System Pressure : 29.614
Hose (Demand) :
D3 - System Demand : 222.889
Hose (Adj City) : 250
Safety Margin : 93.541



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.155	222.89	29.614
TEST	43.0	37	1839.0	42.514	472.89	42.514

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>	
DP01	14.0	16.8	11.0	55.72	0.01	130
EQ01	14.5		15.55			
201	14.5	14.13	15.55	55.72	K=K @ EQ01	
202	14.5	14.13	15.55	55.72	K=K @ EQ01	
232	14.5		16.48			
258	14.5		21.42			
234	14.5		21.43			
235	14.5		21.46			
236	14.5		21.49			
237	14.5		21.52			
238	14.5		21.55			
239	14.5		21.58			
240	14.5		21.61			
241	14.5		21.64			
242	14.5		21.67			
243	14.5		21.7			
244	14.5		21.72			
245	14.5		21.75			
246	14.5		21.78			
247	14.5		21.81			
248	14.5		21.84			
249	14.5		21.87			
250	14.5		21.9			
251	14.5		21.94			
252	14.5		21.97			
253	14.5		22.02			
254	14.5		22.06			
255	14.5		22.21			
256	14.5		22.27			
257	14.5		22.31			
230	14.5		22.35			
231	14.5		22.78			
TR2	14.5		22.96			
BR2	3.58		28.01			
BR1	3.58		28.35			
127	2.792		28.7			
128	2.0		29.07			
PO	1.08		29.61			
PI	1.08		34.47			
FLG	-5.0		37.17			
TEST	-2.0		42.51	250.0		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
233	14.5		16.35		
267	14.5		21.45		
264	19.0		19.6		
265	20.18		19.36		
266	20.12		19.39		
259	14.5		21.42		
260	14.5		21.45		
261	19.0		19.51		
262	19.0		19.57		
263	19.0		19.58		
203	14.5		21.44		
204	14.5		21.47		
205	14.5		21.49		
206	14.5		21.52		
207	14.5		21.55		
208	14.5		21.58		
209	14.5		21.61		
210	14.5		21.64		
211	14.5		21.67		
212	14.5		21.7		
213	14.5		21.72		
214	14.5		21.75		
215	14.5		21.77		
216	14.5		21.8		
217	14.5		21.82		
218	14.5		21.84		
219	14.5		21.86		
220	14.5		21.88		
221	14.5		21.89		
222	14.5		21.9		
223	14.5		21.92		
224	14.5		21.92		
225	14.5		21.92		
226	14.5		21.92		
227	14.5		21.93		
228	17.26		20.76		
229	17.26		21.13		
268	14.5		16.48		
269	14.5	14.13	15.55	55.73	K=K @ EQ01
270	14.5	14.13	15.55	55.72	K=K @ EQ01
271	14.5		16.35		
272	14.5		21.46		
273	17.63		20.58		
274	17.63		20.84		
275	17.46		20.66		
276	17.46		20.97		
277	17.36		20.71		
278	17.36		21.05		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
DP01 to EQ01	14 14.5	16.80	55.72 55.72	1 1.049	T 5.0	0.500 5.000 5.500	120 0.8662	11.000 -0.217 4.764		Vel = 20.68	
EQ01			0.0 55.72					15.547		K Factor = 14.13	
201 to 202	14.5 14.5	14.13	2.20 2.2	1.5 1.682		10.000 10.000	120 0.0002	15.547 0.0 0.002		K = K @ EQ01 Vel = 0.32	
202 to 232	14.5 14.5	14.13	55.73 57.93	1.5 1.682		10.000 10.000	120 0.0934	15.549 0.0 0.934		K = K @ EQ01 Vel = 8.36	
232 to 258	14.5 14.5		0.0 57.93	1.5 1.682	T 9.9	43.000 9.900 52.900	120 0.0934	16.483 0.0 4.939		Vel = 8.36	
258 to 234	14.5 14.5		-19.34 38.59	4 4.26		10.000 10.000	120 0.0005	21.422 0.0 0.005		Vel = 0.87	
234 to 235	14.5 14.5		57.95 96.54	4 4.26		12.000 12.000	120 0.0026	21.427 0.0 0.031		Vel = 2.17	
235 to 236	14.5 14.5		-1.21 95.33	4 4.26		11.000 11.000	120 0.0025	21.458 0.0 0.028		Vel = 2.15	
236 to 237	14.5 14.5		-0.93 94.4	4 4.26		13.000 13.000	120 0.0025	21.486 0.0 0.033		Vel = 2.12	
237 to 238	14.5 14.5		-0.66 93.74	4 4.26		12.500 12.500	120 0.0025	21.519 0.0 0.031		Vel = 2.11	
238 to 239	14.5 14.5		-0.44 93.3	4 4.26		12.000 12.000	120 0.0024	21.550 0.0 0.029		Vel = 2.10	
239 to 240	14.5 14.5		-0.27 93.03	4 4.26		13.000 13.000	120 0.0024	21.579 0.0 0.031		Vel = 2.09	
240 to 241	14.5 14.5		-0.14 92.89	4 4.26		12.000 12.000	120 0.0025	21.610 0.0 0.030		Vel = 2.09	
241 to 242	14.5 14.5		0.06 92.95	4 4.26		13.000 13.000	120 0.0024	21.640 0.0 0.031		Vel = 2.09	
242 to 243	14.5 14.5		0.21 93.16	4 4.26		11.000 11.000	120 0.0025	21.671 0.0 0.027		Vel = 2.10	
243 to 244	14.5 14.5		0.35 93.51	4 4.26		11.000 11.000	120 0.0025	21.698 0.0 0.027		Vel = 2.10	
244 to 245	14.5 14.5		0.52 94.03	4 4.26		11.000 11.000	120 0.0025	21.725 0.0 0.027		Vel = 2.12	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
245 to 246	14.5 14.5		0.74 94.77	4 4.26		11.000 11.000	120 0.0025	21.752 0.0 0.028		Vel = 2.13	
246 to 247	14.5 14.5		1.00 95.77	4 4.26		11.000 11.000	120 0.0025	21.780 0.0 0.028		Vel = 2.16	
247 to 248	14.5 14.5		1.31 97.08	4 4.26		11.000 11.000	120 0.0026	21.808 0.0 0.029		Vel = 2.19	
248 to 249	14.5 14.5		1.66 98.74	4 4.26		11.330 11.330	120 0.0027	21.837 0.0 0.031		Vel = 2.22	
249 to 250	14.5 14.5		2.06 100.8	4 4.26		12.000 12.000	120 0.0028	21.868 0.0 0.033		Vel = 2.27	
250 to 251	14.5 14.5		2.55 103.35	4 4.26		12.670 12.670	120 0.0030	21.901 0.0 0.038		Vel = 2.33	
251 to 252	14.5 14.5		3.10 106.45	4 4.26		11.000 11.000	120 0.0031	21.939 0.0 0.034		Vel = 2.40	
252 to 253	14.5 14.5		3.63 110.08	4 4.26		13.000 13.000	120 0.0033	21.973 0.0 0.043		Vel = 2.48	
253 to 254	14.5 14.5		4.31 114.39	4 4.26		13.000 13.000	120 0.0035	22.016 0.0 0.046		Vel = 2.57	
254 to 255	14.5 14.5		5.02 119.41	4 4.26	2E 26.334	12.930 26.334 39.264	120 0.0039	22.062 0.0 0.152		Vel = 2.69	
255 to 256	14.5 14.5		4.29 123.7	4 4.26		14.000 14.000	120 0.0041	22.214 0.0 0.057		Vel = 2.78	
256 to 257	14.5 14.5		4.71 128.41	4 4.26		8.500 8.500	120 0.0045	22.271 0.0 0.038		Vel = 2.89	
257 to 230	14.5 14.5		4.97 133.38	4 4.26		8.500 8.500	120 0.0047	22.309 0.0 0.040		Vel = 3.00	
230 to 231	14.5 14.5		5.24 138.62	4 4.26	E T 13.167 26.334	45.710 39.501 85.211	120 0.0051	22.349 0.0 0.433		Vel = 3.12	
231 to TR2	14.5 14.5		84.27 222.89	4 4.26	E 13.167	1.000 13.167 14.167	120 0.0122	22.782 0.0 0.173		Vel = 5.02	
TR2 to BR2	14.5 3.580		0.0 222.89	4 4.26	G E 2.633 13.167	10.920 15.800 26.720	120 0.0122	22.955 4.729 0.327		Vel = 5.02	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
BR2 to BR1	3.580 3.58		0.0 222.89	4 4.26	T	26.334	1.670 26.334 28.004	120 0.0122	28.011 0.0 0.343		Vel = 5.02	
BR1 to 127	3.58 2.792		0.0 222.89	6 6.357			0.792 0.792	120 0.0013	28.354 0.341 0.001		Vel = 2.25	
127 to 128	2.792 2		0.0 222.89	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0018	28.696 0.343 0.035		Vel = 2.25	
128 to PO	2 1.080		0.0 222.89	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0005	29.074 0.398 0.142		Vel = 1.34	
PO			0.0 222.89						29.614		K Factor = 40.96	
System Demand Pressure									29.614			
Safety Margin									93.541			
Continuation Pressure									123.155			
Pressure @ Pump Outlet									123.155			
Pressure From Pump Curve									-88.682			
Pressure @ Pump Inlet									34.473			
PI to FLG	1.080 -5		0.0 222.89	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0005	34.473 2.633 0.068		Vel = 1.34	
FLG to TEST	-5 -2		0.0 222.89	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0004	37.174 5.258 0.082		* * Fixed Loss = 6.557 Vel = 1.33	
TEST			250.00 472.89						42.514		Qa = 250.00 K Factor = 72.53	
201 to 233	14.5 14.5		53.52 53.52	1.5 1.682			10.000 10.000	120 0.0807	15.547 0.0 0.807		Vel = 7.73	
233 to 267	14.5 14.5		0.0 53.52	1.5 1.682	T	9.9	53.250 9.900 63.150	120 0.0806	16.354 0.0 5.092		Vel = 7.73	
267 to 264	14.5 19		11.41 64.93	3 3.26	E	9.408	12.300 9.408 21.708	120 0.0046	21.446 -1.949 0.100		Vel = 2.50	
264 to 265	19 20.18		19.34 84.27	3 3.26	E T	9.408 20.159	7.850 29.567 37.417	120 0.0074	19.597 -0.511 0.278		Vel = 3.24	
265 to 266	20.18 20.12		0.0 84.27	6 6.357			5.210 5.210	120 0.0004	19.364 0.026 0.002		Vel = 0.85	
266 to 231	20.12 14.5		0.0 84.27	4 4.26	7E	92.17	380.500 92.170 472.670	120 0.0020	19.392 2.434 0.956		Vel = 1.90	
			0.0									

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
231			84.27						22.782		K Factor = 17.66	
258 to 259	14.5 14.5		19.34	4			3.830	120	21.422 0.0			
259 to 260	14.5 14.5		19.34	4.26			3.830	0.0003	0.001		Vel = 0.44	
259 to 260	14.5 14.5		0.0	3	2E	18.815	30.800 18.815	120	21.423 0.0			
260 to 261	14.5 19		19.34	3.26			49.615	0.0005	0.024		Vel = 0.74	
260 to 261	14.5 19		0.0	3	T	20.159	4.500 20.159	120	21.447 -1.949			
261 to 262	19 19		19.34	3.26			24.659	0.0005	0.012		Vel = 0.74	
261 to 262	19 19		0.0	3	3E	28.223	88.580 28.223	120	19.510 0.0			
262 to 263	19 19		19.34	3.26			116.803	0.0005	0.058		Vel = 0.74	
262 to 263	19 19		0.0	3			29.580	120	19.568 0.0			
263 to 264	19 19		19.34	3.26			29.580	0.0005	0.014		Vel = 0.74	
263 to 264	19 19		0.0	3	E T	9.408 20.159	1.260 29.567	120	19.582 0.0			
264			19.34	3.26			30.827	0.0005	0.015		Vel = 0.74	
264			0.0									
264			19.34						19.597		K Factor = 4.37	
267 to 203	14.5 14.5		-11.41	3			10.000	120	21.446 0.0			
203 to 204	14.5 14.5		-11.41	3.26			10.000	-0.0002	-0.002		Vel = 0.44	
203 to 204	14.5 14.5		53.50	3			12.000	120	21.444 0.0			
204 to 205	14.5 14.5		42.09	3.26			12.000	0.0021	0.025		Vel = 1.62	
204 to 205	14.5 14.5		1.20	3			11.000	120	21.469 0.0			
205 to 206	14.5 14.5		43.29	3.26			11.000	0.0022	0.024		Vel = 1.66	
205 to 206	14.5 14.5		0.93	3			13.000	120	21.493 0.0			
206 to 207	14.5 14.5		44.22	3.26			13.000	0.0022	0.029		Vel = 1.70	
206 to 207	14.5 14.5		0.66	3			12.500	120	21.522 0.0			
207 to 208	14.5 14.5		44.88	3.26			12.500	0.0023	0.029		Vel = 1.73	
207 to 208	14.5 14.5		0.44	3			12.000	120	21.551 0.0			
208 to 209	14.5 14.5		45.32	3.26			12.000	0.0024	0.029		Vel = 1.74	
208 to 209	14.5 14.5		0.28	3			13.000	120	21.580 0.0			
209 to 210	14.5 14.5		45.6	3.26			13.000	0.0024	0.031		Vel = 1.75	
209 to 210	14.5 14.5		0.13	3			12.000	120	21.611 0.0			
210 to 211	14.5 14.5		45.73	3.26			12.000	0.0024	0.029		Vel = 1.76	
210 to 211	14.5 14.5		-0.06	3			13.000	120	21.640 0.0			
211			45.67	3.26			13.000	0.0024	0.031		Vel = 1.76	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
211 to 212	14.5 14.5		-0.21 45.46	3 3.26		11.000 11.000	120 0.0024	21.671 0.0 0.026		Vel = 1.75	
212 to 213	14.5 14.5		-0.35 45.11	3 3.26		11.000 11.000	120 0.0024	21.697 0.0 0.026		Vel = 1.73	
213 to 214	14.5 14.5		-0.52 44.59	3 3.26		11.000 11.000	120 0.0023	21.723 0.0 0.025		Vel = 1.71	
214 to 215	14.5 14.5		-0.74 43.85	3 3.26		11.000 11.000	120 0.0022	21.748 0.0 0.024		Vel = 1.69	
215 to 216	14.5 14.5		-1.00 42.85	3 3.26		11.000 11.000	120 0.0022	21.772 0.0 0.024		Vel = 1.65	
216 to 217	14.5 14.5		-1.31 41.54	3 3.26		11.000 11.000	120 0.0020	21.796 0.0 0.022		Vel = 1.60	
217 to 218	14.5 14.5		-1.65 39.89	3 3.26		11.330 11.330	120 0.0019	21.818 0.0 0.021		Vel = 1.53	
218 to 219	14.5 14.5		-2.07 37.82	3 3.26		12.000 12.000	120 0.0017	21.839 0.0 0.020		Vel = 1.45	
219 to 220	14.5 14.5		-2.55 35.27	3 3.26		12.670 12.670	120 0.0015	21.859 0.0 0.019		Vel = 1.36	
220 to 221	14.5 14.5		-3.10 32.17	3 3.26		11.000 11.000	120 0.0013	21.878 0.0 0.014		Vel = 1.24	
221 to 222	14.5 14.5		-3.63 28.54	3 3.26		13.000 13.000	120 0.0010	21.892 0.0 0.013		Vel = 1.10	
222 to 223	14.5 14.5		-4.31 24.23	3 3.26		13.000 13.000	120 0.0008	21.905 0.0 0.010		Vel = 0.93	
223 to 224	14.5 14.5		-5.02 19.21	3 3.26		10.420 10.420	120 0.0005	21.915 0.0 0.005		Vel = 0.74	
224 to 225	14.5 14.5		-4.29 14.92	3 3.26		14.000 14.000	120 0.0003	21.920 0.0 0.004		Vel = 0.57	
225 to 226	14.5 14.5		-4.71 10.21	3 3.26		8.500 8.500	120 0.0001	21.924 0.0 0.001		Vel = 0.39	
226 to 227	14.5 14.5		-4.97 5.24	3 3.26		8.500 8.500	120 0.0001	21.925 0.0 0.001		Vel = 0.20	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
227 to 228	14.5 17.26		0.0 5.24	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0027	21.926 -1.195 0.024		Vel = 1.12	
228 to 229	17.26 17.26		0.0 5.24	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0029	20.755 0.0 0.373		Vel = 1.12	
229 to 230	17.26 14.5		0.0 5.24	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0030	21.128 1.195 0.026		Vel = 1.12	
230			0.0 5.24						22.349		K Factor = 1.11	
234 to 268	14.5 14.5		-57.95 -57.95	1.5 1.682	T	9.9	43.000 9.900 52.900	120 -0.0934	21.427 0.0 -4.942		Vel = 8.37	
268 to 269	14.5 14.5		0.0 -57.95	1.5 1.682			10.000 10.000	120 -0.0934	16.485 0.0 -0.934		Vel = 8.37	
269 to 270	14.5 14.5	14.13	55.73 -2.22	1.5 1.682			10.000 10.000	120 -0.0003	15.551 0.0 -0.003		K = K @ EQ01 Vel = 0.32	
270 to 271	14.5 14.5	14.13	55.72 53.5	1.5 1.682			10.000 10.000	120 0.0806	15.548 0.0 0.806		K = K @ EQ01 Vel = 7.72	
271 to 203	14.5 14.5		0.0 53.5	1.5 1.682	T	9.9	53.250 9.900 63.150	120 0.0806	16.354 0.0 5.090		Vel = 7.72	
203			0.0 53.50						21.444		K Factor = 11.55	
235 to 272	14.5 14.5		1.21 1.21	1.5 1.682	T	9.9	43.000 9.900 52.900	120 0.0001	21.458 0.0 0.004		Vel = 0.17	
272 to 204	14.5 14.5		0.0 1.21	1.5 1.682	T	9.9	83.250 9.900 93.150	120 0.0001	21.462 0.0 0.007		Vel = 0.17	
204			0.0 1.21						21.469		K Factor = 0.26	
236 to 205	14.5 14.5		0.93 0.93	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.486 0.0 0.007		Vel = 0.13	
205			0.0 0.93						21.493		K Factor = 0.20	
237 to 206	14.5 14.5		0.66 0.66	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.519 0.0 0.003		Vel = 0.10	
206			0.0 0.66						21.522		K Factor = 0.14	
238 to 207	14.5 14.5		0.44 0.44	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.550 0.0 0.001		Vel = 0.06	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
207			0.0 0.44						21.551		K Factor = 0.09	
239 to 208	14.5 14.5		0.28 0.28	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.579 0.0 0.001		Vel = 0.04	
208			0.0 0.28						21.580		K Factor = 0.06	
240 to 209	14.5 14.5		0.14 0.14	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.610 0.0 0.001		Vel = 0.02	
209			0.0 0.14						21.611		K Factor = 0.03	
241 to 210	14.5 14.5		-0.06 -0.06	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.640 0.0 0.0		Vel = 0.01	
210			0.0 -0.06						21.640		K Factor = -0.01	
242 to 211	14.5 14.5		-0.21 -0.21	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.671 0.0 0.0		Vel = 0.03	
211			0.0 -0.21						21.671		K Factor = -0.05	
243 to 212	14.5 14.5		-0.35 -0.35	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.698 0.0 -0.001		Vel = 0.05	
212			0.0 -0.35						21.697		K Factor = -0.08	
244 to 213	14.5 14.5		-0.52 -0.52	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.725 0.0 -0.002		Vel = 0.08	
213			0.0 -0.52						21.723		K Factor = -0.11	
214 to 245	14.5 14.5		0.74 0.74	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	21.748 0.0 0.004		Vel = 0.11	
245			0.0 0.74						21.752		K Factor = 0.16	
215 to 246	14.5 14.5		1.00 1.0	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	21.772 0.0 0.008		Vel = 0.14	
246			0.0 1.00						21.780		K Factor = 0.21	
216 to 247	14.5 14.5		1.31 1.31	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	21.796 0.0 0.012		Vel = 0.19	
247			0.0 1.31						21.808		K Factor = 0.28	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
217 to 248	14.5 14.5		1.66 1.66	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0001	21.818 0.0 0.019		Vel = 0.24	
248			0.0 1.66					21.837		K Factor = 0.36	
218 to 249	14.5 14.5		2.07 2.07	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0002	21.839 0.0 0.029		Vel = 0.30	
249			0.0 2.07					21.868		K Factor = 0.44	
219 to 250	14.5 14.5		2.55 2.55	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0003	21.859 0.0 0.042		Vel = 0.37	
250			0.0 2.55					21.901		K Factor = 0.54	
220 to 251	14.5 14.5		3.10 3.1	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0004	21.878 0.0 0.061		Vel = 0.45	
251			0.0 3.10					21.939		K Factor = 0.66	
221 to 252	14.5 14.5		3.63 3.63	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0006	21.892 0.0 0.081		Vel = 0.52	
252			0.0 3.63					21.973		K Factor = 0.77	
222 to 253	14.5 14.5		4.30 4.3	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0008	21.905 0.0 0.111		Vel = 0.62	
253			0.0 4.30					22.016		K Factor = 0.92	
223 to 254	14.5 14.5		5.02 5.02	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0010	21.915 0.0 0.147		Vel = 0.72	
254			0.0 5.02					22.062		K Factor = 1.07	
224 to 273	14.5 17.63		4.30 4.3	1.25 1.38	T 6.0	3.130 6.000 9.130	120 0.0020	21.920 -1.356 0.018		Vel = 0.92	
273 to 274	17.63 17.63		0.0 4.3	1.25 1.38	2E 6.0	123.740 6.000 129.740	120 0.0020	20.582 0.0 0.258		Vel = 0.92	
274 to 255	17.63 14.5		0.0 4.3	1.25 1.38	T 6.0	3.130 6.000 9.130	120 0.0020	20.840 1.356 0.018		Vel = 0.92	
255			0.0 4.30					22.214		K Factor = 0.91	
225 to 275	14.5 17.46		4.70 4.7	1.25 1.38	T 6.0	2.960 6.000 8.960	120 0.0023	21.924 -1.282 0.021		Vel = 1.01	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
275 to 276	17.46 17.46		0.0 4.7	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0024	20.663 0.0 0.305		Vel = 1.01	
276 to 256	17.46 14.5		0.0 4.7	1.25 1.38	T	6.0	2.960 6.000 8.960	120 0.0023	20.968 1.282 0.021		Vel = 1.01	
256			0.0 4.70						22.271		K Factor = 1.00	
226 to 277	14.5 17.36		4.97 4.97	1.25 1.38	T	6.0	2.860 6.000 8.860	120 0.0027	21.925 -1.239 0.024		Vel = 1.07	
277 to 278	17.36 17.36		0.0 4.97	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0026	20.710 0.0 0.337		Vel = 1.07	
278 to 257	17.36 14.5		0.0 4.97	1.25 1.38	T	6.0	2.860 6.000 8.860	120 0.0026	21.047 1.239 0.023		Vel = 1.07	
257			0.0 4.97						22.309		K Factor = 1.05	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS2 SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

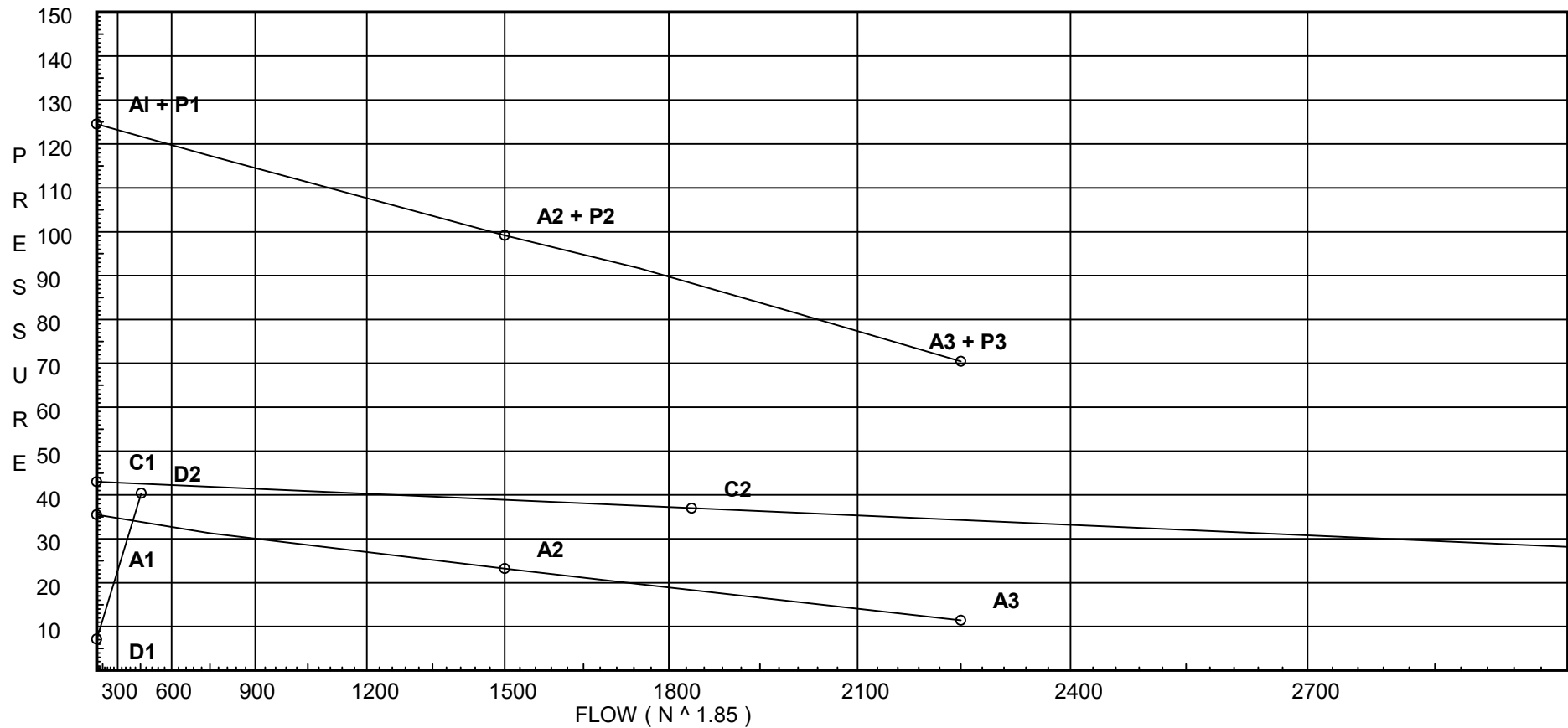
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 7.146
D2 - System Flow : 453.929
D2 - System Pressure : 40.418
Hose (Demand) :
D3 - System Demand : 453.929
Hose (Adj City) : 250
Safety Margin : 80.488



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.906	453.93	40.418
TEST	43.0	37	1839.0	41.985	703.93	41.985

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>	
DP01	14.0	16.8	8.0	47.52	0.01	130
EQ01	14.5		11.33			
201	14.5	14.12	11.33	47.52	K=K @ EQ01	
202	14.5	14.12	11.34	47.53	K=K @ EQ01	
232	14.5	14.12	12.08	49.07	K=K @ EQ01	
258	14.5		25.74			
234	14.5		25.75			
235	14.5		25.83			
236	14.5		25.94			
237	14.5		26.06			
238	14.5		26.18			
239	14.5		26.29			
240	14.5		26.41			
241	14.5		26.52			
242	14.5		26.64			
243	14.5		26.74			
244	14.5		26.84			
245	14.5		26.94			
246	14.5		27.05			
247	14.5		27.15			
248	14.5		27.26			
249	14.5		27.38			
250	14.5		27.5			
251	14.5		27.64			
252	14.5		27.77			
253	14.5		27.93			
254	14.5		28.11			
255	14.5		28.68			
256	14.5		28.89			
257	14.5		29.03			
230	14.5		29.18			
231	14.5		30.8			
TR2	14.5		31.45			
BR2	3.58		37.4			
BR1	3.58		38.67			
127	2.792		39.02			
128	2.0		39.49			
PO	1.08		40.42			
PI	1.08		33.09			
FLG	-5.0		35.98			
TEST	-2.0		41.98	250.0		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
233	14.5	14.12	11.89	48.67	K=K @ EQ01
267	14.5		25.88		
264	19.0		24.29		
265	20.18		24.81		
266	20.12		24.84		
259	14.5		25.74		
260	14.5		25.84		
261	19.0		23.94		
262	19.0		24.17		
263	19.0		24.23		
203	14.5		25.87		
204	14.5		25.91		
205	14.5		25.99		
206	14.5		26.09		
207	14.5		26.2		
208	14.5		26.3		
209	14.5		26.42		
210	14.5		26.52		
211	14.5		26.64		
212	14.5		26.74		
213	14.5		26.83		
214	14.5		26.93		
215	14.5		27.02		
216	14.5		27.11		
217	14.5		27.19		
218	14.5		27.27		
219	14.5		27.35		
220	14.5		27.42		
221	14.5		27.47		
222	14.5		27.52		
223	14.5		27.55		
224	14.5		27.57		
225	14.5		27.59		
226	14.5		27.59		
227	14.5		27.59		
228	17.26		26.49		
229	17.26		27.89		
268	14.5	14.12	12.08	49.07	K=K @ EQ01
269	14.5	14.12	11.34	47.53	K=K @ EQ01
270	14.5	14.12	11.33	47.52	K=K @ EQ01
271	14.5	14.12	11.89	48.67	K=K @ EQ01
272	14.5	14.12	23.45	68.35	K=K @ EQ01
273	17.63		26.28		
274	17.63		27.25		
275	17.46		26.38		
276	17.46		27.53		
277	17.36		26.44		
278	17.36		27.71		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
DP01 to EQ01	14 14.5	16.80	47.52 47.52	1 1.049	T 5.0	0.500 5.000 5.500	120 0.6453	8.000 -0.217 3.549			
			0.0						Vel =	17.64	
EQ01			47.52					11.332		K Factor =	14.12
201 to 202	14.5 14.5	14.12	3.77	1.5		10.000	120	11.333 0.0		K = K @ EQ01	
			3.77	1.682		10.000	0.0006	0.006		Vel =	0.54
202 to 232	14.5 14.5	14.12	47.53	1.5		10.000	120	11.339 0.0		K = K @ EQ01	
			51.3	1.682		10.000	0.0746	0.746		Vel =	7.41
232 to 258	14.5 14.5	14.12	49.07	1.5	T 9.9	43.000 9.900 52.900	120	12.085 0.0		K = K @ EQ01	
			100.37	1.682		52.900	0.2581	13.655		Vel =	14.49
258 to 234	14.5 14.5		-41.23	4		10.000	120	25.740 0.0			
			59.14	4.26		10.000	0.0010	0.010		Vel =	1.33
234 to 235	14.5 14.5		100.41	4		12.000	120	25.750 0.0			
			159.55	4.26		12.000	0.0066	0.079		Vel =	3.59
235 to 236	14.5 14.5		39.07	4		11.000	120	25.829 0.0			
			198.62	4.26		11.000	0.0099	0.109		Vel =	4.47
236 to 237	14.5 14.5		-2.86	4		13.000	120	25.938 0.0			
			195.76	4.26		13.000	0.0096	0.125		Vel =	4.41
237 to 238	14.5 14.5		-2.14	4		12.500	120	26.063 0.0			
			193.62	4.26		12.500	0.0094	0.118		Vel =	4.36
238 to 239	14.5 14.5		-1.55	4		12.000	120	26.181 0.0			
			192.07	4.26		12.000	0.0092	0.111		Vel =	4.32
239 to 240	14.5 14.5		-1.08	4		13.000	120	26.292 0.0			
			190.99	4.26		13.000	0.0092	0.120		Vel =	4.30
240 to 241	14.5 14.5		-0.66	4		12.000	120	26.412 0.0			
			190.33	4.26		12.000	0.0091	0.109		Vel =	4.28
241 to 242	14.5 14.5		-0.30	4		13.000	120	26.521 0.0			
			190.03	4.26		13.000	0.0092	0.119		Vel =	4.28
242 to 243	14.5 14.5		0.35	4		11.000	120	26.640 0.0			
			190.38	4.26		11.000	0.0091	0.100		Vel =	4.29
243 to 244	14.5 14.5		0.68	4		11.000	120	26.740 0.0			
			191.06	4.26		11.000	0.0093	0.102		Vel =	4.30
244 to 245	14.5 14.5		1.06	4		11.000	120	26.842 0.0			
			192.12	4.26		11.000	0.0093	0.102		Vel =	4.32

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
245 to 246	14.5 14.5		1.50 193.62	4 4.26		11.000 11.000	120 0.0094	26.944 0.0 0.103		Vel = 4.36	
246 to 247	14.5 14.5		2.04 195.66	4 4.26		11.000 11.000	120 0.0096	27.047 0.0 0.106		Vel = 4.40	
247 to 248	14.5 14.5		2.67 198.33	4 4.26		11.000 11.000	120 0.0098	27.153 0.0 0.108		Vel = 4.46	
248 to 249	14.5 14.5		3.38 201.71	4 4.26		11.330 11.330	120 0.0102	27.261 0.0 0.116		Vel = 4.54	
249 to 250	14.5 14.5		4.23 205.94	4 4.26		12.000 12.000	120 0.0105	27.377 0.0 0.126		Vel = 4.64	
250 to 251	14.5 14.5		5.20 211.14	4 4.26		12.670 12.670	120 0.0111	27.503 0.0 0.141		Vel = 4.75	
251 to 252	14.5 14.5		6.34 217.48	4 4.26		11.000 11.000	120 0.0116	27.644 0.0 0.128		Vel = 4.90	
252 to 253	14.5 14.5		7.41 224.89	4 4.26		13.000 13.000	120 0.0125	27.772 0.0 0.162		Vel = 5.06	
253 to 254	14.5 14.5		8.80 233.69	4 4.26		13.000 13.000	120 0.0133	27.934 0.0 0.173		Vel = 5.26	
254 to 255	14.5 14.5		10.25 243.94	4 4.26	2E 26.334	12.930 26.334 39.264	120 0.0145	28.107 0.0 0.568		Vel = 5.49	
255 to 256	14.5 14.5		8.78 252.72	4 4.26		14.000 14.000	120 0.0154	28.675 0.0 0.216		Vel = 5.69	
256 to 257	14.5 14.5		9.61 262.33	4 4.26		8.500 8.500	120 0.0165	28.891 0.0 0.140		Vel = 5.90	
257 to 230	14.5 14.5		10.15 272.48	4 4.26		8.500 8.500	120 0.0178	29.031 0.0 0.151		Vel = 6.13	
230 to 231	14.5 14.5		10.71 283.19	4 4.26	E T 13.167 26.334	45.710 39.501 85.211	120 0.0190	29.182 0.0 1.623		Vel = 6.37	
231 to TR2	14.5 14.5		170.74 453.93	4 4.26	E 13.167	1.000 13.167 14.167	120 0.0456	30.805 0.0 0.646		Vel = 10.22	
TR2 to BR2	14.5 3.580		0.0 453.93	4 4.26	G E 2.633 13.167	10.920 15.800 26.720	120 0.0456	31.451 4.729 1.218		Vel = 10.22	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
BR2 to BR1	3.580 3.58		0.0 453.93	4	T	26.334	1.670 26.334 28.004	120	37.398 0.0 1.277			
BR1 to 127	3.58 2.792		0.0 453.93	6			0.792 0.792	120	38.675 0.341 0.005		Vel = 10.22	
127 to 128	2.792 2		0.0 453.93	6	E	17.603	2.375 17.603 19.978	120	39.021 0.343 0.130		Vel = 4.59	
128 to PO	2 1.080		0.0 453.93	8	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120	39.494 0.398 0.526		Vel = 2.73	
PO			0.0 453.93						40.418		K Factor = 71.40	
System Demand Pressure									40.418			
Safety Margin									80.488			
Continuation Pressure									120.906			
Pressure @ Pump Outlet									120.906			
Pressure From Pump Curve									-87.815			
Pressure @ Pump Inlet									33.091			
PI to FLG	1.080 -5		0.0 453.93	8	5E G	105.706 4.698	28.750 110.404 139.154	120	33.091 2.633 0.254		Vel = 2.73	
FLG to TEST	-5 -2		0.0 453.93	8	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140	35.978 5.701 0.306		* * Fixed Loss = 7 Vel = 2.71	
TEST			250.00 703.93						41.985		Qa = 250.00 K Factor = 108.64	
201 to 233	14.5 14.5		43.75 43.75	1.5			10.000 10.000	120	11.333 0.0 0.555		Vel = 6.32	
233 to 267	14.5 14.5	14.12	48.67 92.42	1.5	T	9.9	53.250 9.900 63.150	120	11.888 0.0 13.995		K = K @ EQ01 Vel = 13.34	
267 to 264	14.5 19		37.08 129.5	3	E	9.408	12.300 9.408 21.708	120	25.883 -1.949 0.358		Vel = 4.98	
264 to 265	19 20.18		41.24 170.74	3	E T	9.408 20.159	7.850 29.567 37.417	120	24.292 -0.511 1.028		Vel = 6.56	
265 to 266	20.18 20.12		0.0 170.74	6			5.210 5.210	120	24.809 0.026 0.006		Vel = 1.73	
266 to 231	20.12 14.5		0.0 170.74	4	7E	92.17	380.500 92.170 472.670	120	24.841 2.434 3.530		Vel = 3.84	
			0.0									

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
231			170.74						30.805		K Factor = 30.76	
258 to 259	14.5 14.5		41.23	4			3.830	120	25.740 0.0			
259 to 260	14.5 14.5		41.23	4.26			3.830	0.0005	0.002		Vel = 0.93	
259 to 260	14.5 14.5		0.0	3	2E	18.815	30.800 18.815	120	25.742 0.0			
260 to 261	14.5 19		41.23	3.26			49.615	0.0020	0.098		Vel = 1.58	
260 to 261	14.5 19		0.0	3	T	20.159	4.500 20.159	120	25.840 -1.949			
261 to 262	19 19		41.23	3.26			24.659	0.0020	0.049		Vel = 1.58	
261 to 262	19 19		0.0	3	3E	28.223	88.580 28.223	120	23.940 0.0			
262 to 263	19 19		41.23	3.26			116.803	0.0020	0.232		Vel = 1.58	
262 to 263	19 19		0.0	3			29.580	120	24.172 0.0			
263 to 264	19 19		41.23	3.26			29.580	0.0020	0.059		Vel = 1.58	
263 to 264	19 19		0.0	3	E T	9.408 20.159	1.260 29.567	120	24.231 0.0			
264			41.23				30.827	0.0020	0.061		Vel = 1.58	
264			0.0 41.23						24.292		K Factor = 8.37	
267 to 203	14.5 14.5		-37.08	3			10.000	120	25.883 0.0			
203 to 204	14.5 14.5		-37.08	3.26			10.000	-0.0016	-0.016		Vel = 1.43	
203 to 204	14.5 14.5		92.38	3			12.000	120	25.867 0.0			
204 to 205	14.5 14.5		55.3	3.26			12.000	0.0034	0.041		Vel = 2.13	
204 to 205	14.5 14.5		29.28	3			11.000	120	25.908 0.0			
205 to 206	14.5 14.5		84.58	3.26			11.000	0.0075	0.082		Vel = 3.25	
205 to 206	14.5 14.5		2.85	3			13.000	120	25.990 0.0			
206 to 207	14.5 14.5		87.43	3.26			13.000	0.0080	0.104		Vel = 3.36	
206 to 207	14.5 14.5		2.14	3			12.500	120	26.094 0.0			
207 to 208	14.5 14.5		89.57	3.26			12.500	0.0083	0.104		Vel = 3.44	
207 to 208	14.5 14.5		1.55	3			12.000	120	26.198 0.0			
208 to 209	14.5 14.5		91.12	3.26			12.000	0.0086	0.103		Vel = 3.50	
208 to 209	14.5 14.5		1.08	3			13.000	120	26.301 0.0			
209 to 210	14.5 14.5		92.2	3.26			13.000	0.0088	0.114		Vel = 3.54	
209 to 210	14.5 14.5		0.66	3			12.000	120	26.415 0.0			
210 to 211	14.5 14.5		92.86	3.26			12.000	0.0089	0.107		Vel = 3.57	
210 to 211	14.5 14.5		0.30	3			13.000	120	26.522 0.0			
211			93.16	3.26			13.000	0.0090	0.117		Vel = 3.58	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
211 to 212	14.5 14.5		-0.35 92.81	3 3.26		11.000 11.000	120 0.0089	26.639 0.0 0.098		Vel = 3.57	
212 to 213	14.5 14.5		-0.68 92.13	3 3.26		11.000 11.000	120 0.0087	26.737 0.0 0.096		Vel = 3.54	
213 to 214	14.5 14.5		-1.05 91.08	3 3.26		11.000 11.000	120 0.0086	26.833 0.0 0.095		Vel = 3.50	
214 to 215	14.5 14.5		-1.51 89.57	3 3.26		11.000 11.000	120 0.0083	26.928 0.0 0.091		Vel = 3.44	
215 to 216	14.5 14.5		-2.04 87.53	3 3.26		11.000 11.000	120 0.0080	27.019 0.0 0.088		Vel = 3.36	
216 to 217	14.5 14.5		-2.67 84.86	3 3.26		11.000 11.000	120 0.0075	27.107 0.0 0.083		Vel = 3.26	
217 to 218	14.5 14.5		-3.38 81.48	3 3.26		11.330 11.330	120 0.0070	27.190 0.0 0.079		Vel = 3.13	
218 to 219	14.5 14.5		-4.22 77.26	3 3.26		12.000 12.000	120 0.0064	27.269 0.0 0.077		Vel = 2.97	
219 to 220	14.5 14.5		-5.20 72.06	3 3.26		12.670 12.670	120 0.0055	27.346 0.0 0.070		Vel = 2.77	
220 to 221	14.5 14.5		-6.34 65.72	3 3.26		11.000 11.000	120 0.0047	27.416 0.0 0.052		Vel = 2.53	
221 to 222	14.5 14.5		-7.42 58.3	3 3.26		13.000 13.000	120 0.0038	27.468 0.0 0.049		Vel = 2.24	
222 to 223	14.5 14.5		-8.79 49.51	3 3.26		13.000 13.000	120 0.0028	27.517 0.0 0.036		Vel = 1.90	
223 to 224	14.5 14.5		-10.26 39.25	3 3.26		10.420 10.420	120 0.0018	27.553 0.0 0.019		Vel = 1.51	
224 to 225	14.5 14.5		-8.77 30.48	3 3.26		14.000 14.000	120 0.0011	27.572 0.0 0.016		Vel = 1.17	
225 to 226	14.5 14.5		-9.62 20.86	3 3.26		8.500 8.500	120 0.0005	27.588 0.0 0.004		Vel = 0.80	
226 to 227	14.5 14.5		-10.15 10.71	3 3.26		8.500 8.500	120 0.0002	27.592 0.0 0.002		Vel = 0.41	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
227 to 228	14.5 17.26		0.0 10.71	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0107	27.594 -1.195 0.094		Vel = 2.30	
228 to 229	17.26 17.26		0.0 10.71	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0108	26.493 0.0 1.399		Vel = 2.30	
229 to 230	17.26 14.5		0.0 10.71	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0108	27.892 1.195 0.095		Vel = 2.30	
230			0.0 10.71						29.182		K Factor = 1.98	
234 to 268	14.5 14.5		-100.41 -100.41	1.5 1.682	T	9.9	43.000 9.900 52.900	120 -0.2583	25.750 0.0 -13.665		Vel = 14.50	
268 to 269	14.5 14.5	14.12	49.07 -51.34	1.5 1.682			10.000 10.000	120 -0.0747	12.085 0.0 -0.747		K = K @ EQ01 Vel = 7.41	
269 to 270	14.5 14.5	14.12	47.53 -3.81	1.5 1.682			10.000 10.000	120 -0.0006	11.338 0.0 -0.006		K = K @ EQ01 Vel = 0.55	
270 to 271	14.5 14.5	14.12	47.52 43.71	1.5 1.682			10.000 10.000	120 0.0554	11.332 0.0 0.554		K = K @ EQ01 Vel = 6.31	
271 to 203	14.5 14.5	14.12	48.66 92.37	1.5 1.682	T	9.9	53.250 9.900 63.150	120 0.2214	11.886 0.0 13.981		K = K @ EQ01 Vel = 13.34	
203			0.0 92.37						25.867		K Factor = 18.16	
235 to 272	14.5 14.5		-39.07 -39.07	1.5 1.682	T	9.9	43.000 9.900 52.900	120 -0.0450	25.829 0.0 -2.383		Vel = 5.64	
272 to 204	14.5 14.5	14.12	68.35 29.28	1.5 1.682	T	9.9	83.250 9.900 93.150	120 0.0264	23.446 0.0 2.462		K = K @ EQ01 Vel = 4.23	
204			0.0 29.28						25.908		K Factor = 5.75	
236 to 205	14.5 14.5		2.85 2.85	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0004	25.938 0.0 0.052		Vel = 0.41	
205			0.0 2.85						25.990		K Factor = 0.56	
237 to 206	14.5 14.5		2.14 2.14	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0002	26.063 0.0 0.031		Vel = 0.31	
206			0.0 2.14						26.094		K Factor = 0.42	
238 to 207	14.5 14.5		1.55 1.55	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	26.181 0.0 0.017		Vel = 0.22	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
207			0.0 1.55					26.198		K Factor = 0.30	
239 to 208	14.5 14.5		1.08 1.08	1.5 1.682	2T	19.799 146.049	120 0.0001	26.292 0.0 0.009		Vel = 0.16	
208			0.0 1.08					26.301		K Factor = 0.21	
240 to 209	14.5 14.5		0.66 0.66	1.5 1.682	2T	19.799 146.049	120 0	26.412 0.0 0.003		Vel = 0.10	
209			0.0 0.66					26.415		K Factor = 0.13	
241 to 210	14.5 14.5		0.30 0.3	1.5 1.682	2T	19.799 146.049	120 0	26.521 0.0 0.001		Vel = 0.04	
210			0.0 0.30					26.522		K Factor = 0.06	
242 to 211	14.5 14.5		-0.35 -0.35	1.5 1.682	2T	19.799 146.049	120 0	26.640 0.0 -0.001		Vel = 0.05	
211			0.0 -0.35					26.639		K Factor = -0.07	
243 to 212	14.5 14.5		-0.68 -0.68	1.5 1.682	2T	19.799 146.049	120 0	26.740 0.0 -0.003		Vel = 0.10	
212			0.0 -0.68					26.737		K Factor = -0.13	
244 to 213	14.5 14.5		-1.06 -1.06	1.5 1.682	2T	19.799 146.049	120 -0.0001	26.842 0.0 -0.009		Vel = 0.15	
213			0.0 -1.06					26.833		K Factor = -0.20	
214 to 245	14.5 14.5		1.51 1.51	1.5 1.682	2T	19.799 146.049	120 0.0001	26.928 0.0 0.016		Vel = 0.22	
245			0.0 1.51					26.944		K Factor = 0.29	
215 to 246	14.5 14.5		2.04 2.04	1.5 1.682	2T	19.799 146.049	120 0.0002	27.019 0.0 0.028		Vel = 0.29	
246			0.0 2.04					27.047		K Factor = 0.39	
216 to 247	14.5 14.5		2.67 2.67	1.5 1.682	2T	19.799 146.049	120 0.0003	27.107 0.0 0.046		Vel = 0.39	
247			0.0 2.67					27.153		K Factor = 0.51	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
217 to 248	14.5 14.5		3.38 3.38	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0005	27.190 0.0 0.071		Vel = 0.49	
248			0.0 3.38					27.261		K Factor = 0.65	
218 to 249	14.5 14.5		4.22 4.22	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0007	27.269 0.0 0.108		Vel = 0.61	
249			0.0 4.22					27.377		K Factor = 0.81	
219 to 250	14.5 14.5		5.20 5.2	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0011	27.346 0.0 0.157		Vel = 0.75	
250			0.0 5.20					27.503		K Factor = 0.99	
220 to 251	14.5 14.5		6.34 6.34	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0016	27.416 0.0 0.228		Vel = 0.92	
251			0.0 6.34					27.644		K Factor = 1.21	
221 to 252	14.5 14.5		7.42 7.42	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0021	27.468 0.0 0.304		Vel = 1.07	
252			0.0 7.42					27.772		K Factor = 1.41	
222 to 253	14.5 14.5		8.80 8.8	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0029	27.517 0.0 0.417		Vel = 1.27	
253			0.0 8.80					27.934		K Factor = 1.67	
223 to 254	14.5 14.5		10.26 10.26	1.5 1.682	2T 19.799	126.250 19.799 146.049	120 0.0038	27.553 0.0 0.554		Vel = 1.48	
254			0.0 10.26					28.107		K Factor = 1.94	
224 to 273	14.5 17.63		8.77 8.77	1.25 1.38	T 6.0	3.130 6.000 9.130	120 0.0074	27.572 -1.356 0.068		Vel = 1.88	
273 to 274	17.63 17.63		0.0 8.77	1.25 1.38	2E 6.0	123.740 6.000 129.740	120 0.0075	26.284 0.0 0.967		Vel = 1.88	
274 to 255	17.63 14.5		0.0 8.77	1.25 1.38	T 6.0	3.130 6.000 9.130	120 0.0074	27.251 1.356 0.068		Vel = 1.88	
255			0.0 8.77					28.675		K Factor = 1.64	
225 to 275	14.5 17.46		9.61 9.61	1.25 1.38	T 6.0	2.960 6.000 8.960	120 0.0088	27.588 -1.282 0.079		Vel = 2.06	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
275 to 276	17.46 17.46		0.0 9.61	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0088	26.385 0.0 1.145		Vel = 2.06	
276 to 256	17.46 14.5		0.0 9.61	1.25 1.38	T	6.0	2.960 6.000 8.960	120 0.0088	27.530 1.282 0.079		Vel = 2.06	
256			0.0 9.61						28.891		K Factor = 1.79	
226 to 277	14.5 17.36		10.15 10.15	1.25 1.38	T	6.0	2.860 6.000 8.860	120 0.0098	27.592 -1.239 0.087		Vel = 2.18	
277 to 278	17.36 17.36		0.0 10.15	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0098	26.440 0.0 1.266		Vel = 2.18	
278 to 257	17.36 14.5		0.0 10.15	1.25 1.38	T	6.0	2.860 6.000 8.860	120 0.0097	27.706 1.239 0.086		Vel = 2.18	
257			0.0 10.15						29.031		K Factor = 1.88	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
232	258	43.000	233	267	53.250
234	268	43.000	271	203	53.250
235	272	43.000	272	204	83.250

Flow		Safety		Pressure
Required		Margin		Differential
Left	10.000	704.009	80.987	-0.499
Area Calculated		703.929	80.488	0.000
Right	10.000	703.799	80.491	-0.004

Typical Distance Between Heads = 10.000

Split Point Used in Worst Area Peaked = 270



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS2 SEASONAL 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

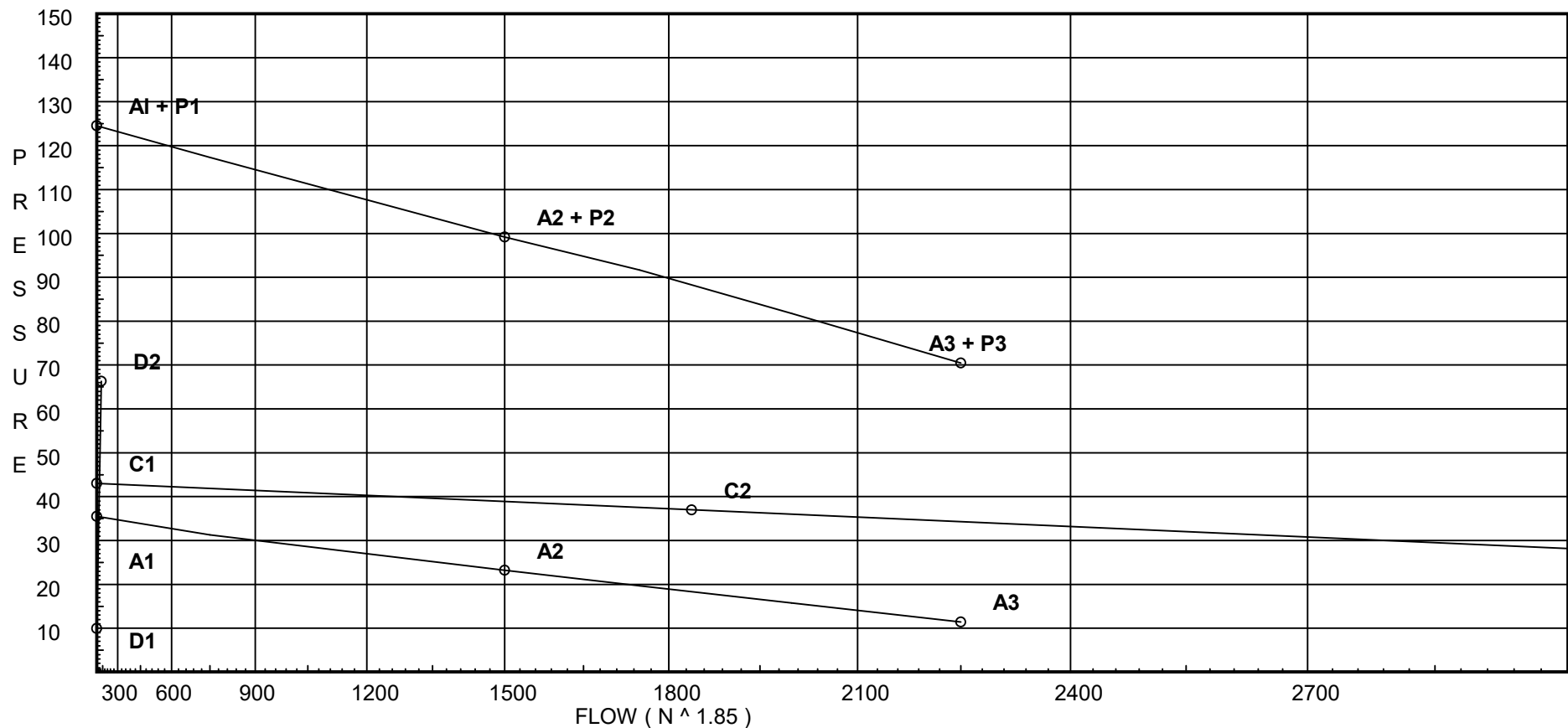
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.953
D2 - System Flow : 133.668
D2 - System Pressure : 66.321
Hose (Demand) :
D3 - System Demand : 133.668
Hose (Adj City) : 250
Safety Margin : 57.499



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.82	133.67	66.321
TEST	43.0	37	1839.0	42.67	383.67	42.67

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>	
279	20.98	11.2	30.0	61.34	0.01	130
280	20.85	11.2	41.7	72.32	0.01	130
281	20.79		54.39			
282	19.0		57.06			
261	19.0		57.37			
260	14.5		59.41			
259	14.5		59.6			
258	14.5		59.6			
234	14.5		59.61			
235	14.5		59.62			
236	14.5		59.63			
237	14.5		59.64			
238	14.5		59.66			
239	14.5		59.67			
240	14.5		59.68			
241	14.5		59.69			
242	14.5		59.7			
243	14.5		59.71			
244	14.5		59.72			
245	14.5		59.73			
246	14.5		59.74			
247	14.5		59.75			
248	14.5		59.76			
249	14.5		59.77			
250	14.5		59.79			
251	14.5		59.8			
252	14.5		59.81			
253	14.5		59.83			
254	14.5		59.85			
255	14.5		59.9			
256	14.5		59.92			
257	14.5		59.94			
230	14.5		59.95			
231	14.5		60.11			
TR2	14.5		60.18			
BR2	3.58		65.04			
BR1	3.58		65.17			
127	2.792		65.51			
128	2.0		65.87			
PO	1.08		66.32			
PI	1.08		34.94			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
FLG	-5.0		37.6		
TEST	-2.0		42.67	250.0	
283	20.98		56.42		
284	20.98		56.42		
285	20.98		56.42		
286	20.98		56.42		
287	20.85		56.48		
288	20.72		56.54		
262	19.0		57.28		
263	19.0		57.46		
264	19.0		57.65		
267	14.5		59.61		
203	14.5		59.62		
204	14.5		59.63		
205	14.5		59.64		
206	14.5		59.65		
207	14.5		59.66		
208	14.5		59.67		
209	14.5		59.68		
210	14.5		59.69		
211	14.5		59.7		
212	14.5		59.71		
213	14.5		59.72		
214	14.5		59.73		
215	14.5		59.74		
216	14.5		59.75		
217	14.5		59.76		
218	14.5		59.76		
219	14.5		59.77		
220	14.5		59.78		
221	14.5		59.78		
222	14.5		59.79		
223	14.5		59.79		
224	14.5		59.79		
225	14.5		59.8		
226	14.5		59.8		
227	14.5		59.8		
228	17.26		58.61		
229	17.26		58.75		
289	20.85		56.48		
290	20.85		56.48		
291	20.85		56.48		
292	20.72		56.54		
265	20.18		57.25		
266	20.12		57.28		
273	17.63		58.44		
274	17.63		58.54		
275	17.46		58.52		
276	17.46		58.63		
277	17.36		58.56		
278	17.36		58.69		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
233	14.5		59.6		
201	14.5		59.6		
202	14.5		59.6		
232	14.5		59.6		
271	14.5		59.61		
270	14.5		59.61		
269	14.5		59.61		
268	14.5		59.61		
272	14.5		59.62		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
279 to 280	20.98 20.85	11.20	61.34	1			11.250	120	30.000 0.056			
280 to 281	20.85 20.79	11.20	61.34	1.049			11.250	1.0348	11.642	Vel =	22.77	
281 to 282	20.79 20.79		72.33	1.25	T	6.0	5.020 6.000	120	41.698 0.026			
282 to 283	20.79 19		133.67	1.38			11.020	1.1497	12.670	Vel =	28.67	
283 to 284	20.79 19		0.0	2	T	10.0	1.790 10.000	120	54.394 0.775			
284 to 285	19 19		133.67	2.067			11.790	0.1607	1.895	Vel =	12.78	
285 to 286	19 19		-75.42	3	E	9.408	71.750 9.408	120	57.064 0.0			
286 to 287	19 14.5		58.25	3.26			81.158	0.0038	0.305	Vel =	2.24	
287 to 288	19 14.5		0.0	3	T	20.159	4.500 20.159	120	57.369 1.949			
288 to 289	14.5 14.5		58.25	3.26			24.659	0.0038	0.093	Vel =	2.24	
289 to 290	14.5 14.5		0.0	3	2E	18.815	30.800 18.815	120	59.411 0.0			
290 to 291	14.5 14.5		58.25	3.26			49.615	0.0037	0.186	Vel =	2.24	
291 to 292	14.5 14.5		0.0	4			3.830	120	59.597 0.0			
292 to 293	14.5 14.5		58.25	4.26			3.830	0.0010	0.004	Vel =	1.31	
293 to 294	14.5 14.5		-1.07	4			10.000	120	59.601 0.0			
294 to 295	14.5 14.5		57.18	4.26			10.000	0.0010	0.010	Vel =	1.29	
295 to 296	14.5 14.5		-0.88	4			12.000	120	59.611 0.0			
296 to 297	14.5 14.5		56.3	4.26			12.000	0.0010	0.012	Vel =	1.27	
297 to 298	14.5 14.5		-0.67	4			11.000	120	59.623 0.0			
298 to 299	14.5 14.5		55.63	4.26			11.000	0.0009	0.010	Vel =	1.25	
299 to 300	14.5 14.5		-0.52	4			13.000	120	59.633 0.0			
300 to 301	14.5 14.5		55.11	4.26			13.000	0.0009	0.012	Vel =	1.24	
301 to 302	14.5 14.5		-0.36	4			12.500	120	59.645 0.0			
302 to 303	14.5 14.5		54.75	4.26			12.500	0.0009	0.011	Vel =	1.23	
303 to 304	14.5 14.5		-0.24	4			12.000	120	59.656 0.0			
304 to 305	14.5 14.5		54.51	4.26			12.000	0.0009	0.011	Vel =	1.23	
305 to 306	14.5 14.5		-0.15	4			13.000	120	59.667 0.0			
306 to 307	14.5 14.5		54.36	4.26			13.000	0.0009	0.012	Vel =	1.22	
307 to 308	14.5 14.5		-0.06	4			12.000	120	59.679 0.0			
308 to 309	14.5 14.5		54.3	4.26			12.000	0.0009	0.011	Vel =	1.22	
309 to 310	14.5 14.5		0.04	4			13.000	120	59.690 0.0			
310 to 311	14.5 14.5		54.34	4.26			13.000	0.0008	0.011	Vel =	1.22	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
242 to 243	14.5 14.5		0.12 54.46	4 4.26			11.000 11.000	120 0.0009	59.701 0.0 0.010		Vel = 1.23	
243 to 244	14.5 14.5		0.20 54.66	4 4.26			11.000 11.000	120 0.0009	59.711 0.0 0.010		Vel = 1.23	
244 to 245	14.5 14.5		0.31 54.97	4 4.26			11.000 11.000	120 0.0009	59.721 0.0 0.010		Vel = 1.24	
245 to 246	14.5 14.5		0.43 55.4	4 4.26			11.000 11.000	120 0.0010	59.731 0.0 0.011		Vel = 1.25	
246 to 247	14.5 14.5		0.59 55.99	4 4.26			11.000 11.000	120 0.0009	59.742 0.0 0.010		Vel = 1.26	
247 to 248	14.5 14.5		0.76 56.75	4 4.26			11.000 11.000	120 0.0010	59.752 0.0 0.011		Vel = 1.28	
248 to 249	14.5 14.5		0.97 57.72	4 4.26			11.330 11.330	120 0.0010	59.763 0.0 0.011		Vel = 1.30	
249 to 250	14.5 14.5		1.21 58.93	4 4.26			12.000 12.000	120 0.0011	59.774 0.0 0.013		Vel = 1.33	
250 to 251	14.5 14.5		1.49 60.42	4 4.26			12.670 12.670	120 0.0010	59.787 0.0 0.013		Vel = 1.36	
251 to 252	14.5 14.5		1.81 62.23	4 4.26			11.000 11.000	120 0.0012	59.800 0.0 0.013		Vel = 1.40	
252 to 253	14.5 14.5		2.13 64.36	4 4.26			13.000 13.000	120 0.0012	59.813 0.0 0.016		Vel = 1.45	
253 to 254	14.5 14.5		2.51 66.87	4 4.26			13.000 13.000	120 0.0013	59.829 0.0 0.017		Vel = 1.51	
254 to 255	14.5 14.5		2.94 69.81	4 4.26	2E	26.334	12.930 26.334 39.264	120 0.0014	59.846 0.0 0.056		Vel = 1.57	
255 to 256	14.5 14.5		2.51 72.32	4 4.26			14.000 14.000	120 0.0016	59.902 0.0 0.022		Vel = 1.63	
256 to 257	14.5 14.5		2.75 75.07	4 4.26			8.500 8.500	120 0.0016	59.924 0.0 0.014		Vel = 1.69	
257 to 230	14.5 14.5		2.90 77.97	4 4.26			8.500 8.500	120 0.0016	59.938 0.0 0.014		Vel = 1.76	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
230 to 231	14.5 14.5		3.07 81.04	4 4.26	E T	13.167 26.334	45.710 39.501 85.211	120 0.0019	59.952 0.0 0.161		Vel = 1.82	
231 to TR2	14.5 14.5		52.63 133.67	4 4.26	E	13.167	1.000 13.167 14.167	120 0.0047	60.113 0.0 0.067		Vel = 3.01	
TR2 to BR2	14.5 3.580		0.0 133.67	4 4.26	G E	2.633 13.167	10.920 15.800 26.720	120 0.0048	60.180 4.729 0.128		Vel = 3.01	
BR2 to BR1	3.580 3.58		0.0 133.67	4 4.26	T	26.334	1.670 26.334 28.004	120 0.0047	65.037 0.0 0.132		Vel = 3.01	
BR1 to 127	3.58 2.792		0.0 133.67	6 6.357			0.792 0.792	120 0.0013	65.169 0.341 0.001		Vel = 1.35	
127 to 128	2.792 2		0.0 133.67	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0007	65.511 0.343 0.014		Vel = 1.35	
128 to PO	2 1.080		0.0 133.67	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0002	65.868 0.398 0.055		Vel = 0.80	
PO			0.0 133.67						66.321		K Factor = 16.41	
System Demand Pressure									66.321			
Safety Margin									57.499			
Continuation Pressure									123.820			
Pressure @ Pump Outlet									123.820			
Pressure From Pump Curve									-88.877			
Pressure @ Pump Inlet									34.943			
PI to FLG	1.080 -5		0.0 133.67	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0002	34.943 2.633 0.027		Vel = 0.80	
FLG to TEST	-5 -2		0.0 133.67	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0001	37.603 5.035 0.032		** Fixed Loss = 6.334 Vel = 0.80	
TEST			250.00 383.67						42.670		Qa = 250.00 K Factor = 58.73	
283 to 284	20.98 20.98	.0	0.0	1.25			11.000	120	56.423 0.0		Vel = 0	
284 to 285	20.98 20.98	.0	0.0	1.5			10.670	120	56.423 0.0		Vel = 0	
285 to 286	20.98 20.98	.0	0.0	1.61			10.670	0	0.0		Vel = 0	
286 to 287	20.98 20.85	.0	0.0	2 3.26	T	10.0	4.670 10.000 14.670 11.250	120 0 0	56.423 0.0 0.0 0.056		Vel = 0	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
287 to 288	20.85 20.72	.0	0.0	3			10.500	120	56.479 0.056 0.0			
288 to 262	20.72 19	.0	0.0	3	E T	9.408 20.159	6.260 29.567 35.827	120	56.535 0.745 0.0		Vel = 0	
262 to 263	19 19		75.42	3			29.580	120	57.280 0.0			
263 to 264	19 19		75.42	3	E T	9.408 20.159	1.260 29.567 30.827	120	57.460 0.0		Vel = 2.90	
264 to 267	19 14.5		-52.63	3	E	9.408	12.300 9.408 21.708	120	57.646 1.949 0.015		Vel = 0.88	
267 to 203	14.5 14.5		22.79	3			10.000	120	59.610 0.0			
203 to 204	14.5 14.5		23.86	3			10.000	0.0007	0.007		Vel = 0.92	
204 to 205	14.5 14.5		0.88	3			12.000	120	59.617 0.0			
205 to 206	14.5 14.5		24.74	3			12.000	0.0007	0.009		Vel = 0.95	
206 to 207	14.5 14.5		0.67	3			11.000	120	59.626 0.0			
207 to 208	14.5 14.5		25.41	3			11.000	0.0008	0.009		Vel = 0.98	
208 to 209	14.5 14.5		0.52	3			13.000	120	59.635 0.0			
209 to 210	14.5 14.5		25.93	3			13.000	0.0008	0.011		Vel = 1.00	
210 to 211	14.5 14.5		0.36	3			12.500	120	59.646 0.0			
211 to 212	14.5 14.5		26.29	3			12.500	0.0009	0.011		Vel = 1.01	
212 to 213	14.5 14.5		0.24	3			12.000	120	59.657 0.0			
213 to 214	14.5 14.5		26.53	3			12.000	0.0009	0.011		Vel = 1.02	
214 to 215	14.5 14.5		0.15	3			13.000	120	59.668 0.0			
215 to 216	14.5 14.5		26.68	3			13.000	0.0008	0.011		Vel = 1.03	
216 to 217	14.5 14.5		0.06	3			12.000	120	59.679 0.0			
217 to 218	14.5 14.5		26.74	3			12.000	0.0009	0.011		Vel = 1.03	
218 to 219	14.5 14.5		-0.04	3			13.000	120	59.690 0.0			
219 to 220	14.5 14.5		26.7	3			13.000	0.0008	0.011		Vel = 1.03	
220 to 221	14.5 14.5		-0.12	3			11.000	120	59.701 0.0			
221 to 222	14.5 14.5		26.58	3			11.000	0.0009	0.010		Vel = 1.02	
222 to 223	14.5 14.5		-0.20	3			11.000	120	59.711 0.0			
223 to 224	14.5 14.5		26.38	3			11.000	0.0008	0.009		Vel = 1.01	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
213 to 214	14.5 14.5		-0.31 26.07	3 3.26			11.000 11.000	120 0.0009	59.720 0.0 0.010		Vel = 1.00	
214 to 215	14.5 14.5		-0.43 25.64	3 3.26			11.000 11.000	120 0.0008	59.730 0.0 0.009		Vel = 0.99	
215 to 216	14.5 14.5		-0.59 25.05	3 3.26			11.000 11.000	120 0.0008	59.739 0.0 0.009		Vel = 0.96	
216 to 217	14.5 14.5		-0.76 24.29	3 3.26			11.000 11.000	120 0.0007	59.748 0.0 0.008		Vel = 0.93	
217 to 218	14.5 14.5		-0.97 23.32	3 3.26			11.330 11.330	120 0.0007	59.756 0.0 0.008		Vel = 0.90	
218 to 219	14.5 14.5		-1.21 22.11	3 3.26			12.000 12.000	120 0.0006	59.764 0.0 0.007		Vel = 0.85	
219 to 220	14.5 14.5		-1.49 20.62	3 3.26			12.670 12.670	120 0.0006	59.771 0.0 0.007		Vel = 0.79	
220 to 221	14.5 14.5		-1.81 18.81	3 3.26			11.000 11.000	120 0.0005	59.778 0.0 0.005		Vel = 0.72	
221 to 222	14.5 14.5		-2.13 16.68	3 3.26			13.000 13.000	120 0.0004	59.783 0.0 0.005		Vel = 0.64	
222 to 223	14.5 14.5		-2.51 14.17	3 3.26			13.000 13.000	120 0.0003	59.788 0.0 0.004		Vel = 0.54	
223 to 224	14.5 14.5		-2.94 11.23	3 3.26			10.420 10.420	120 0.0001	59.792 0.0 0.001		Vel = 0.43	
224 to 225	14.5 14.5		-2.51 8.72	3 3.26			14.000 14.000	120 0.0001	59.793 0.0 0.002		Vel = 0.34	
225 to 226	14.5 14.5		-2.75 5.97	3 3.26			8.500 8.500	120 0.0001	59.795 0.0 0.001		Vel = 0.23	
226 to 227	14.5 14.5		-2.90 3.07	3 3.26			8.500 8.500	120 0	59.796 0.0 0.0		Vel = 0.12	
227 to 228	14.5 17.26		0.0 3.07	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0010	59.796 -1.195 0.009		Vel = 0.66	
228 to 229	17.26 17.26		0.0 3.07	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0011	58.610 0.0 0.138		Vel = 0.66	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
229 to 230	17.26 14.5		0.0 3.07	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0010	58.748 1.195 0.009		Vel = 0.66	
230			0.0 3.07						59.952		K Factor = 0.40	
289 to 290	20.85 20.85	.0	0.0	1.25 1.38			11.000 11.000	120 0	56.479 0.0 0.0		Vel = 0	
290 to 291	20.85 20.85	.0	0.0	1.5 1.61			10.670 10.670	120 0	56.479 0.0 0.0		Vel = 0	
291 to 287	20.85 20.85	.0	0.0	2 2.067	T	10.0	4.670 10.000 14.670	120 0	56.479 0.0 0.0		Vel = 0	
287			0.0 0.0						56.479		K Factor = 0	
292 to 288	20.72 20.72	.0	0.0	2 2.067	T	10.0	4.670 10.000 14.670	120 0	56.535 0.0 0.0		Vel = 0	
288			0.0 0.0						56.535		K Factor = 0	
262 to 282	19 19		-75.42 -75.42	3 3.26	2E	18.815	16.830 18.815 35.645	120 -0.0061	57.280 0.0 -0.216		Vel = 2.90	
282			0.0 -75.42						57.064		K Factor = -9.98	
264 to 265	19 20.18		52.63	3 3.26	E T	9.408 20.159	7.850 29.567 37.417	120 0.0031	57.646 -0.511 0.117		Vel = 2.02	
265 to 266	20.18 20.12		0.0	6 6.357			5.210 5.210	120 0.0002	57.252 0.026 0.001		Vel = 0.53	
266 to 231	20.12 14.5		0.0	4 4.26	7E	92.17	380.500 92.170 472.670	120 0.0008	57.279 2.434 0.400		Vel = 1.18	
231			0.0 52.63						60.113		K Factor = 6.79	
224 to 273	14.5 17.63		2.51	1.25 1.38	T	6.0	3.130 6.000 9.130	120 0.0008	59.793 -1.356 0.007		Vel = 0.54	
273 to 274	17.63 17.63		0.0	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0007	58.444 0.0 0.096		Vel = 0.54	
274 to 255	17.63 14.5		0.0	1.25 1.38	T	6.0	3.130 6.000 9.130	120 0.0007	58.540 1.356 0.006		Vel = 0.54	
			0.0									

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
255			2.51					59.902		K Factor = 0.32	
225 to 275	14.5 17.46		2.75 2.75	1.25 1.38	T	6.0	2.960 6.000 8.960	120 -1.282 0.008		Vel = 0.59	
275 to 276	17.46 17.46		0.0 2.75	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0 0.113		Vel = 0.59	
276 to 256	17.46 14.5		0.0 2.75	1.25 1.38	T	6.0	2.960 6.000 8.960	120 1.282 0.008		Vel = 0.59	
256			0.0 2.75					59.924		K Factor = 0.36	
226 to 277	14.5 17.36		2.90 2.9	1.25 1.38	T	6.0	2.860 6.000 8.860	120 -1.239 0.008		Vel = 0.62	
277 to 278	17.36 17.36		0.0 2.9	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0 0.125		Vel = 0.62	
278 to 257	17.36 14.5		0.0 2.9	1.25 1.38	T	6.0	2.860 6.000 8.860	120 1.239 0.009		Vel = 0.62	
257			0.0 2.90					59.938		K Factor = 0.37	
267 to 233	14.5 14.5		-1.07 -1.07	1.5 1.682	T	9.9	83.250 9.900 93.150	120 0.0 -0.006		Vel = 0.15	
233 to 201	14.5 14.5		0.0 -1.07	1.5 1.682			10.000 10.000	120 0.0		Vel = 0.15	
201 to 202	14.5 14.5		0.0 -1.07	1.5 1.682			10.000 10.000	120 -0.001		Vel = 0.15	
202 to 232	14.5 14.5		0.0 -1.07	1.5 1.682			10.000 10.000	120 0.0		Vel = 0.15	
232 to 258	14.5 14.5		0.0 -1.07	1.5 1.682	T	9.9	13.000 9.900 22.900	120 0.0 -0.002		Vel = 0.15	
258			0.0 -1.07					59.601		K Factor = -0.14	
203 to 271	14.5 14.5		-0.88 -0.88	1.5 1.682	T	9.9	83.250 9.900 93.150	120 0.0 -0.004		Vel = 0.13	
271 to 270	14.5 14.5		0.0 -0.88	1.5 1.682			10.000 10.000	120 0.0		Vel = 0.13	
270 to 269	14.5 14.5		0.0 -0.88	1.5 1.682			10.000 10.000	120 0.0		Vel = 0.13	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
269 to 268	14.5 14.5		0.0 -0.88	1.5 1.682			10.000 10.000	120 0	59.612 0.0			
268 to 234	14.5 14.5		0.0 -0.88	1.5 1.682	T	9.9	13.000 9.900 22.900	120 0	59.612 0.0 -0.001		Vel = 0.13	
234			0.0 -0.88						59.611		K Factor = -0.11	
204 to 272	14.5 14.5		-0.67 -0.67	1.5 1.682	T	9.9	113.250 9.900 123.150	120 0	59.626 0.0 -0.003		Vel = 0.10	
272 to 235	14.5 14.5		0.0 -0.67	1.5 1.682	T	9.9	13.000 9.900 22.900	120 0	59.623 0.0 0.0		Vel = 0.10	
235			0.0 -0.67						59.623		K Factor = -0.09	
205 to 236	14.5 14.5		-0.52 -0.52	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.635 0.0 -0.002		Vel = 0.08	
236			0.0 -0.52						59.633		K Factor = -0.07	
206 to 237	14.5 14.5		-0.36 -0.36	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.646 0.0 -0.001		Vel = 0.05	
237			0.0 -0.36						59.645		K Factor = -0.05	
207 to 238	14.5 14.5		-0.24 -0.24	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.657 0.0 -0.001		Vel = 0.03	
238			0.0 -0.24						59.656		K Factor = -0.03	
208 to 239	14.5 14.5		-0.15 -0.15	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.668 0.0 -0.001		Vel = 0.02	
239			0.0 -0.15						59.667		K Factor = -0.02	
209 to 240	14.5 14.5		-0.07 -0.07	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.679 0.0 0.0		Vel = 0.01	
240			0.0 -0.07						59.679		K Factor = -0.01	
210 to 241	14.5 14.5		0.04 0.04	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.690 0.0 0.0		Vel = 0.01	
241			0.0 0.04						59.690		K Factor = 0.01	
211 to 242	14.5 14.5		0.12 0.12	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.701 0.0 0.0		Vel = 0.02	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
242			0.0 0.12						59.701		K Factor = 0.02	
212 to 243	14.5 14.5		0.20 0.2	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.711 0.0 0.0		Vel = 0.03	
243			0.0 0.20						59.711		K Factor = 0.03	
213 to 244	14.5 14.5		0.31 0.31	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.720 0.0 0.001		Vel = 0.04	
244			0.0 0.31						59.721		K Factor = 0.04	
214 to 245	14.5 14.5		0.43 0.43	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.730 0.0 0.001		Vel = 0.06	
245			0.0 0.43						59.731		K Factor = 0.06	
215 to 246	14.5 14.5		0.58 0.58	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.739 0.0 0.003		Vel = 0.08	
246			0.0 0.58						59.742		K Factor = 0.08	
216 to 247	14.5 14.5		0.76 0.76	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.748 0.0 0.004		Vel = 0.11	
247			0.0 0.76						59.752		K Factor = 0.10	
217 to 248	14.5 14.5		0.97 0.97	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	59.756 0.0 0.007		Vel = 0.14	
248			0.0 0.97						59.763		K Factor = 0.13	
218 to 249	14.5 14.5		1.21 1.21	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	59.764 0.0 0.010		Vel = 0.17	
249			0.0 1.21						59.774		K Factor = 0.16	
219 to 250	14.5 14.5		1.49 1.49	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	59.771 0.0 0.016		Vel = 0.22	
250			0.0 1.49						59.787		K Factor = 0.19	
220 to 251	14.5 14.5		1.81 1.81	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0002	59.778 0.0 0.022		Vel = 0.26	
251			0.0 1.81						59.800		K Factor = 0.23	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
221 to 252	14.5 14.5		2.12 2.12	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0002	59.783 0.0 0.030		Vel = 0.31	
252			0.0 2.12						59.813		K Factor = 0.27	
222 to 253	14.5 14.5		2.52 2.52	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0003	59.788 0.0 0.041		Vel = 0.36	
253			0.0 2.52						59.829		K Factor = 0.33	
223 to 254	14.5 14.5		2.94 2.94	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0004	59.792 0.0 0.054		Vel = 0.42	
254			0.0 2.94						59.846		K Factor = 0.38	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS2 SEASONAL 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

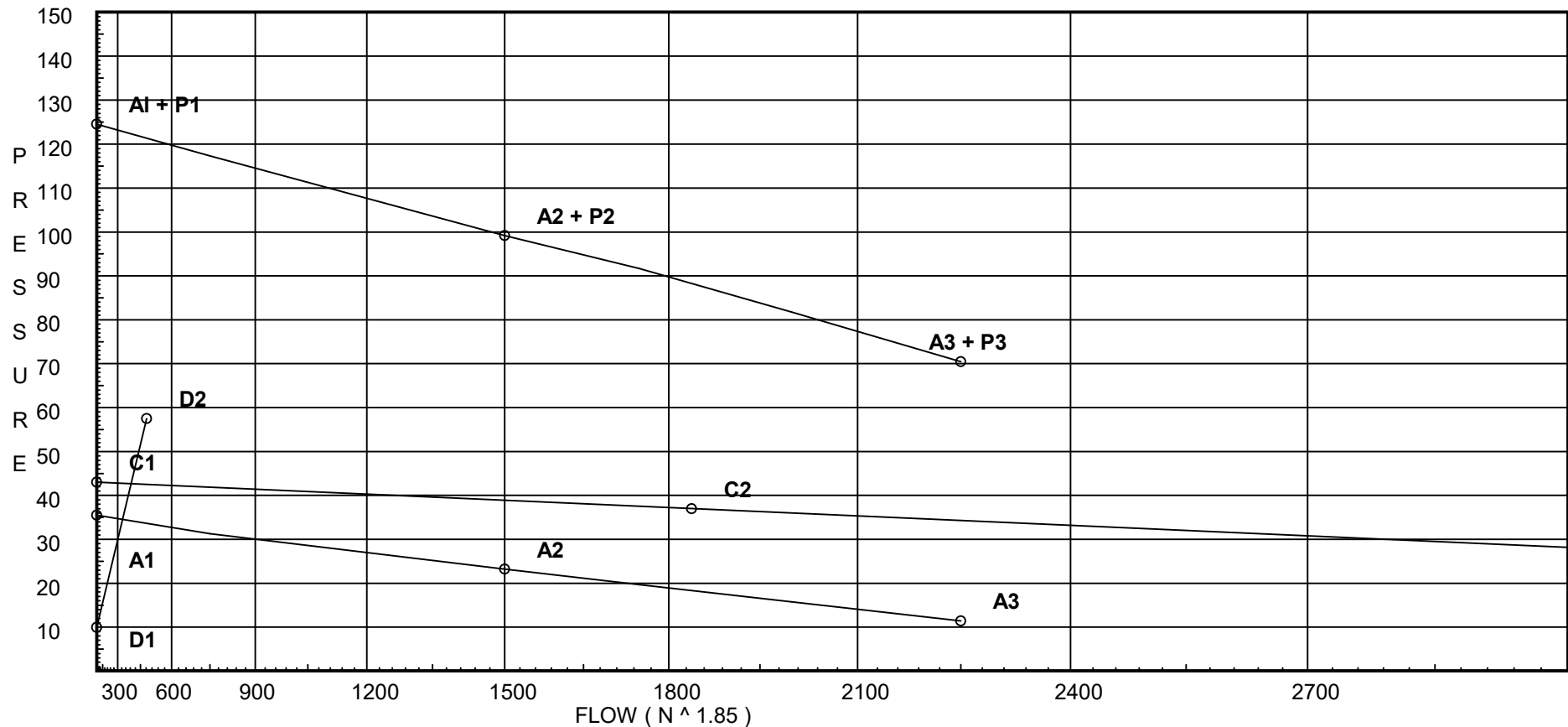
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.953
D2 - System Flow : 483.086
D2 - System Pressure : 57.489
Hose (Demand) :
D3 - System Demand : 483.086
Hose (Adj City) : 250
Safety Margin : 63.124



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.613	483.09	57.489
TEST	43.0	37	1839.0	41.906	733.09	41.906

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>	
279	20.98	11.2	18.0	47.52	0.01	130
280	20.85	11.2	25.31	56.35	0.01	130
281	20.79		33.29			
282	19.0		35.25			
261	19.0		37.76			
260	14.5		40.47			
259	14.5		42.01			
258	14.5		42.04			
234	14.5		42.13			
235	14.5		42.23			
236	14.5		42.34			
237	14.5		42.46			
238	14.5		42.57			
239	14.5		42.69			
240	14.5		42.81			
241	14.5		42.92			
242	14.5		43.05			
243	14.5		43.15			
244	14.5		43.26			
245	14.5		43.36			
246	14.5		43.47			
247	14.5		43.58			
248	14.5		43.7			
249	14.5		43.82			
250	14.5		43.95			
251	14.5		44.1			
252	14.5		44.23			
253	14.5		44.4			
254	14.5		44.58			
255	14.5		45.18			
256	14.5		45.41			
257	14.5		45.55			
230	14.5		45.71			
231	14.5		47.41			
TR2	14.5		48.14			
BR2	3.58		54.23			
BR1	3.58		55.66			
127	2.792		56.01			
128	2.0		56.5			
PO	1.08		57.49			
PI	1.08		32.94			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
FLG	-5.0		35.86			
TEST	-2.0		41.91	250.0		
283	20.98	11.2	19.85	49.9	0.01	130
284	20.98	11.2	21.89	52.4	0.01	130
285	20.98	11.2	25.42	56.47	0.01	130
286	20.98		28.67			
287	20.85		28.99			
288	20.72		29.96			
262	19.0		35.02			
263	19.0		37.34			
264	19.0		39.76			
267	14.5		41.97			
203	14.5		42.08			
204	14.5		42.2			
205	14.5		42.32			
206	14.5		42.45			
207	14.5		42.57			
208	14.5		42.68			
209	14.5		42.81			
210	14.5		42.92			
211	14.5		43.04			
212	14.5		43.15			
213	14.5		43.25			
214	14.5		43.35			
215	14.5		43.44			
216	14.5		43.54			
217	14.5		43.62			
218	14.5		43.71			
219	14.5		43.79			
220	14.5		43.86			
221	14.5		43.91			
222	14.5		43.97			
223	14.5		44.0			
224	14.5		44.02			
225	14.5		44.04			
226	14.5		44.04			
227	14.5		44.05			
228	17.26		42.95			
229	17.26		44.42			
289	20.85	11.2	20.08	50.19	0.01	130
290	20.85	11.2	22.15	52.71	0.01	130
291	20.85	11.2	25.72	56.8	0.01	130
292	20.72	11.2	29.42	60.74	0.01	130
265	20.18		40.53			
266	20.12		40.57			
273	17.63		42.74			
274	17.63		43.75			
275	17.46		42.84			
276	17.46		44.04			
277	17.36		42.9			
278	17.36		44.22			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
233	14.5		42.01		
201	14.5		42.02		
202	14.5		42.02		
232	14.5		42.03		
271	14.5		42.11		
270	14.5		42.11		
269	14.5		42.12		
268	14.5		42.12		
272	14.5		42.23		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
279 to 280	20.98 20.85	11.20	47.52	1			11.250	120	18.000 0.056			
			47.52	1.049			11.250	0.6452	7.258	Vel =	17.64	
280 to 281	20.85 20.79	11.20	56.35	1.25	T	6.0	5.020 6.000	120	25.314 0.026			
			103.87	1.38			11.020	0.7211	7.946	Vel =	22.28	
281 to 282	20.79 19		0.0	2	T	10.0	1.790 10.000	120	33.286 0.775			
			103.87	2.067			11.790	0.1008	1.188	Vel =	9.93	
282 to 261	19 19		78.17	3	E	9.408	71.750 9.408	120	35.249 0.0			
			182.04	3.26			81.158	0.0310	2.512	Vel =	7.00	
261 to 260	19 14.5		0.0	3	T	20.159	4.500 20.159	120	37.761 1.949			
			182.04	3.26			24.659	0.0309	0.763	Vel =	7.00	
260 to 259	14.5 14.5		0.0	3	2E	18.815	30.800 18.815	120	40.473 0.0			
			182.04	3.26			49.615	0.0309	1.535	Vel =	7.00	
259 to 258	14.5 14.5		0.0	4			3.830	120	42.008 0.0			
			182.04	4.26			3.830	0.0084	0.032	Vel =	4.10	
258 to 234	14.5 14.5		3.46	4			10.000	120	42.040 0.0			
			185.5	4.26			10.000	0.0087	0.087	Vel =	4.18	
234 to 235	14.5 14.5		2.78	4			12.000	120	42.127 0.0			
			188.28	4.26			12.000	0.0089	0.107	Vel =	4.24	
235 to 236	14.5 14.5		2.09	4			11.000	120	42.234 0.0			
			190.37	4.26			11.000	0.0092	0.101	Vel =	4.29	
236 to 237	14.5 14.5		1.57	4			13.000	120	42.335 0.0			
			191.94	4.26			13.000	0.0093	0.121	Vel =	4.32	
237 to 238	14.5 14.5		1.07	4			12.500	120	42.456 0.0			
			193.01	4.26			12.500	0.0094	0.117	Vel =	4.34	
238 to 239	14.5 14.5		0.69	4			12.000	120	42.573 0.0			
			193.7	4.26			12.000	0.0094	0.113	Vel =	4.36	
239 to 240	14.5 14.5		0.43	4			13.000	120	42.686 0.0			
			194.13	4.26			13.000	0.0095	0.123	Vel =	4.37	
240 to 241	14.5 14.5		0.27	4			12.000	120	42.809 0.0			
			194.4	4.26			12.000	0.0095	0.114	Vel =	4.38	
241 to 242	14.5 14.5		0.30	4			13.000	120	42.923 0.0			
			194.7	4.26			13.000	0.0095	0.124	Vel =	4.38	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
242 to 243	14.5 14.5		0.48 195.18	4 4.26			11.000 11.000	120 0.0095	43.047 0.0 0.105		Vel = 4.39	
243 to 244	14.5 14.5		0.75 195.93	4 4.26			11.000 11.000	120 0.0096	43.152 0.0 0.106		Vel = 4.41	
244 to 245	14.5 14.5		1.10 197.03	4 4.26			11.000 11.000	120 0.0097	43.258 0.0 0.107		Vel = 4.44	
245 to 246	14.5 14.5		1.56 198.59	4 4.26			11.000 11.000	120 0.0099	43.365 0.0 0.109		Vel = 4.47	
246 to 247	14.5 14.5		2.10 200.69	4 4.26			11.000 11.000	120 0.0100	43.474 0.0 0.110		Vel = 4.52	
247 to 248	14.5 14.5		2.74 203.43	4 4.26			11.000 11.000	120 0.0104	43.584 0.0 0.114		Vel = 4.58	
248 to 249	14.5 14.5		3.47 206.9	4 4.26			11.330 11.330	120 0.0107	43.698 0.0 0.121		Vel = 4.66	
249 to 250	14.5 14.5		4.33 211.23	4 4.26			12.000 12.000	120 0.0111	43.819 0.0 0.133		Vel = 4.75	
250 to 251	14.5 14.5		5.34 216.57	4 4.26			12.670 12.670	120 0.0115	43.952 0.0 0.146		Vel = 4.87	
251 to 252	14.5 14.5		6.50 223.07	4 4.26			11.000 11.000	120 0.0123	44.098 0.0 0.135		Vel = 5.02	
252 to 253	14.5 14.5		7.61 230.68	4 4.26			13.000 13.000	120 0.0131	44.233 0.0 0.170		Vel = 5.19	
253 to 254	14.5 14.5		9.02 239.7	4 4.26			13.000 13.000	120 0.0139	44.403 0.0 0.181		Vel = 5.40	
254 to 255	14.5 14.5		10.52 250.22	4 4.26	2E	26.334	12.930 26.334 39.264	120 0.0152	44.584 0.0 0.595		Vel = 5.63	
255 to 256	14.5 14.5		9.00 259.22	4 4.26			14.000 14.000	120 0.0162	45.179 0.0 0.227		Vel = 5.83	
256 to 257	14.5 14.5		9.86 269.08	4 4.26			8.500 8.500	120 0.0173	45.406 0.0 0.147		Vel = 6.06	
257 to 230	14.5 14.5		10.42 279.5	4 4.26			8.500 8.500	120 0.0186	45.553 0.0 0.158		Vel = 6.29	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
230 to 231	14.5 14.5		10.98 290.48	4 4.26	E T	13.167 26.334	45.710 39.501 85.211	120 0.0200	45.711 0.0 1.701		Vel = 6.54	
231 to TR2	14.5 14.5		192.61 483.09	4 4.26	E	13.167	1.000 13.167 14.167	120 0.0512	47.412 0.0 0.725		Vel = 10.87	
TR2 to BR2	14.5 3.580		0.0 483.09	4 4.26	G E	2.633 13.167	10.920 15.800 26.720	120 0.0512	48.137 4.729 1.367		Vel = 10.87	
BR2 to BR1	3.580 3.58		0.0 483.09	4 4.26	T	26.334	1.670 26.334 28.004	120 0.0511	54.233 0.0 1.432		Vel = 10.87	
BR1 to 127	3.58 2.792		0.0 483.09	6 6.357			0.792 0.792	120 0.0076	55.665 0.341 0.006		Vel = 4.88	
127 to 128	2.792 2		0.0 483.09	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0073	56.012 0.343 0.146		Vel = 4.88	
128 to PO	2 1.080		0.0 483.09	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0020	56.501 0.398 0.590		Vel = 2.90	
PO			0.0 483.09						57.489		K Factor = 63.71	
System Demand Pressure									57.489			
Safety Margin									63.124			
Continuation Pressure									120.613			
Pressure @ Pump Outlet									120.613			
Pressure From Pump Curve									-87.671			
Pressure @ Pump Inlet									32.942			
PI to FLG	1.080 -5		0.0 483.09	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0020	32.942 2.633 0.285		Vel = 2.90	
FLG to TEST	-5 -2		0.0 483.09	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0015	35.860 5.701 0.345		** Fixed Loss = 7 Vel = 2.89	
TEST			250.00 733.09						41.906		Qa = 250.00 K Factor = 113.25	
283 to 284	20.98 20.98	11.20	49.90 49.9	1.25 1.38			11.000 11.000	120 0.1857	19.850 0.0 2.043		Vel = 10.70	
284 to 285	20.98 20.98	11.20	52.40 102.3	1.5 1.61			10.670 10.670	120 0.3309	21.893 0.0 3.531		Vel = 16.12	
285 to 286	20.98 20.98	11.20	56.48 158.78	2 2.067	T	10.0	4.670 10.000 14.670	120 0.2210	25.424 0.0 3.242		Vel = 15.18	
286 to 287	20.98 20.85		0.0 158.78	3 3.26			11.250 11.250	120 0.0241	28.666 0.056 0.271		Vel = 6.10	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
287 to 288	20.85 20.72		159.69 318.47	3 3.26			10.500 10.500	120 0.0871	28.993 0.056 0.915		Vel = 12.24	
288 to 262	20.72 19		60.75 379.22	3 3.26	E T	9.408 20.159	6.260 29.567 35.827	120 0.1203	29.964 0.745 4.309		Vel = 14.58	
262 to 263	19 19		-78.17 301.05	3 3.26			29.580 29.580	120 0.0785	35.018 0.0 2.322		Vel = 11.57	
263 to 264	19 19		0.0 301.05	3 3.26	E T	9.408 20.159	1.260 29.567 30.827	120 0.0785	37.340 0.0 2.419		Vel = 11.57	
264 to 267	19 14.5		-192.60 108.45	3 3.26	E	9.408	12.300 9.408 21.708	120 0.0119	39.759 1.949 0.258		Vel = 4.17	
267 to 203	14.5 14.5		-3.46 104.99	3 3.26			10.000 10.000	120 0.0112	41.966 0.0 0.112		Vel = 4.04	
203 to 204	14.5 14.5		-2.78 102.21	3 3.26			12.000 12.000	120 0.0106	42.078 0.0 0.127		Vel = 3.93	
204 to 205	14.5 14.5		-2.09 100.12	3 3.26			11.000 11.000	120 0.0103	42.205 0.0 0.113		Vel = 3.85	
205 to 206	14.5 14.5		-1.57 98.55	3 3.26			13.000 13.000	120 0.0099	42.318 0.0 0.129		Vel = 3.79	
206 to 207	14.5 14.5		-1.07 97.48	3 3.26			12.500 12.500	120 0.0098	42.447 0.0 0.122		Vel = 3.75	
207 to 208	14.5 14.5		-0.69 96.79	3 3.26			12.000 12.000	120 0.0096	42.569 0.0 0.115		Vel = 3.72	
208 to 209	14.5 14.5		-0.43 96.36	3 3.26			13.000 13.000	120 0.0095	42.684 0.0 0.124		Vel = 3.70	
209 to 210	14.5 14.5		-0.28 96.08	3 3.26			12.000 12.000	120 0.0095	42.808 0.0 0.114		Vel = 3.69	
210 to 211	14.5 14.5		-0.29 95.79	3 3.26			13.000 13.000	120 0.0095	42.922 0.0 0.123		Vel = 3.68	
211 to 212	14.5 14.5		-0.49 95.3	3 3.26			11.000 11.000	120 0.0094	43.045 0.0 0.103		Vel = 3.66	
212 to 213	14.5 14.5		-0.74 94.56	3 3.26			11.000 11.000	120 0.0092	43.148 0.0 0.101		Vel = 3.63	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
213 to 214	14.5 14.5		-1.11 93.45	3 3.26			11.000 11.000	120 0.0090	43.249 0.0 0.099		Vel = 3.59	
214 to 215	14.5 14.5		-1.55 91.9	3 3.26			11.000 11.000	120 0.0087	43.348 0.0 0.096		Vel = 3.53	
215 to 216	14.5 14.5		-2.10 89.8	3 3.26			11.000 11.000	120 0.0084	43.444 0.0 0.092		Vel = 3.45	
216 to 217	14.5 14.5		-2.74 87.06	3 3.26			11.000 11.000	120 0.0079	43.536 0.0 0.087		Vel = 3.35	
217 to 218	14.5 14.5		-3.48 83.58	3 3.26			11.330 11.330	120 0.0073	43.623 0.0 0.083		Vel = 3.21	
218 to 219	14.5 14.5		-4.33 79.25	3 3.26			12.000 12.000	120 0.0067	43.706 0.0 0.080		Vel = 3.05	
219 to 220	14.5 14.5		-5.33 73.92	3 3.26			12.670 12.670	120 0.0058	43.786 0.0 0.074		Vel = 2.84	
220 to 221	14.5 14.5		-6.51 67.41	3 3.26			11.000 11.000	120 0.0049	43.860 0.0 0.054		Vel = 2.59	
221 to 222	14.5 14.5		-7.61 59.8	3 3.26			13.000 13.000	120 0.0040	43.914 0.0 0.052		Vel = 2.30	
222 to 223	14.5 14.5		-9.02 50.78	3 3.26			13.000 13.000	120 0.0028	43.966 0.0 0.037		Vel = 1.95	
223 to 224	14.5 14.5		-10.52 40.26	3 3.26			10.420 10.420	120 0.0019	44.003 0.0 0.020		Vel = 1.55	
224 to 225	14.5 14.5		-9.00 31.26	3 3.26			14.000 14.000	120 0.0012	44.023 0.0 0.017		Vel = 1.20	
225 to 226	14.5 14.5		-9.86 21.4	3 3.26			8.500 8.500	120 0.0006	44.040 0.0 0.005		Vel = 0.82	
226 to 227	14.5 14.5		-10.41 10.99	3 3.26			8.500 8.500	120 0.0001	44.045 0.0 0.001		Vel = 0.42	
227 to 228	14.5 17.26		0.0 10.99	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0113	44.046 -1.195 0.099		Vel = 2.36	
228 to 229	17.26 17.26		0.0 10.99	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0113	42.950 0.0 1.467		Vel = 2.36	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
229 to 230	17.26 14.5		0.0 10.99	1.25 1.38	T	6.0	2.760 6.000 8.760	120 0.0113	44.417 1.195 0.099		Vel = 2.36	
230			0.0 10.99						45.711		K Factor = 1.63	
289 to 290	20.85 20.85	11.20	50.19 50.19	1.25 1.38			11.000 11.000	120 0.1877	20.082 0.0 2.065		Vel = 10.77	
290 to 291	20.85 20.85	11.20	52.71 102.9	1.5 1.61			10.670 10.670	120 0.3345	22.147 0.0 3.569		Vel = 16.22	
291 to 287	20.85 20.85	11.20	56.80 159.7	2 2.067	T	10.0	4.670 10.000 14.670	120 0.2234	25.716 0.0 3.277		Vel = 15.27	
287			0.0 159.70						28.993		K Factor = 29.66	
292 to 288	20.72 20.72	11.20	60.74 60.74	2 2.067	T	10.0	4.670 10.000 14.670	120 0.0374	29.416 0.0 0.548		Vel = 5.81	
288			0.0 60.74						29.964		K Factor = 11.10	
262 to 282	19 19		78.17 78.17	3 3.26	2E	18.815	16.830 18.815 35.645	120 0.0065	35.018 0.0 0.231		Vel = 3.00	
282			0.0 78.17						35.249		K Factor = 13.17	
264 to 265	19 20.18		192.60 192.6	3 3.26	E T	9.408 20.159	7.850 29.567 37.417	120 0.0343	39.759 -0.511 1.285		Vel = 7.40	
265 to 266	20.18 20.12		0.0 192.6	6 6.357			5.210 5.210	120 0.0013	40.533 0.026 0.007		Vel = 1.95	
266 to 231	20.12 14.5		0.0 192.6	4 4.26	7E	92.17	380.500 92.170 472.670	120 0.0093	40.566 2.434 4.412		Vel = 4.34	
231			0.0 192.60						47.412		K Factor = 27.97	
224 to 273	14.5 17.63		9.00 9.0	1.25 1.38	T	6.0	3.130 6.000 9.130	120 0.0079	44.023 -1.356 0.072		Vel = 1.93	
273 to 274	17.63 17.63		0.0 9.0	1.25 1.38	2E	6.0	123.740 6.000 129.740	120 0.0078	42.739 0.0 1.013		Vel = 1.93	
274 to 255	17.63 14.5		0.0 9.0	1.25 1.38	T	6.0	3.130 6.000 9.130	120 0.0078	43.752 1.356 0.071		Vel = 1.93	
			0.0									

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
255			9.00					45.179		K Factor = 1.34	
225 to 275	14.5 17.46		9.86	1.25	T 6.0	2.960 6.000 8.960	120	44.040 -1.282 0.083		Vel = 2.11	
275 to 276	17.46 17.46		0.0	1.25	2E 6.0	123.740 6.000 129.740	120	42.841 0.0 1.200		Vel = 2.11	
276 to 256	17.46 14.5		0.0	1.25	T 6.0	2.960 6.000 8.960	120	44.041 1.282 0.083		Vel = 2.11	
256			0.0 9.86					45.406		K Factor = 1.46	
226 to 277	14.5 17.36		10.41	1.25	T 6.0	2.860 6.000 8.860	120	44.045 -1.239 0.091		Vel = 2.23	
277 to 278	17.36 17.36		0.0	1.25	2E 6.0	123.740 6.000 129.740	120	42.897 0.0 1.327		Vel = 2.23	
278 to 257	17.36 14.5		0.0	1.25	T 6.0	2.860 6.000 8.860	120	44.224 1.239 0.090		Vel = 2.23	
257			0.0 10.41					45.553		K Factor = 1.54	
267 to 233	14.5 14.5		3.46	1.5	T 9.9	83.250 9.900 93.150	120	41.966 0.0 0.047		Vel = 0.50	
233 to 201	14.5 14.5		0.0	1.5		10.000	120	42.013 0.0 0.005		Vel = 0.50	
201 to 202	14.5 14.5		0.0	1.5		10.000	120	42.018 0.0 0.005		Vel = 0.50	
202 to 232	14.5 14.5		0.0	1.5		10.000	120	42.023 0.0 0.005		Vel = 0.50	
232 to 258	14.5 14.5		0.0	1.5	T 9.9	13.000 9.900 22.900	120	42.028 0.0 0.012		Vel = 0.50	
258			0.0 3.46					42.040		K Factor = 0.53	
203 to 271	14.5 14.5		2.78	1.5	T 9.9	83.250 9.900 93.150	120	42.078 0.0 0.031		Vel = 0.40	
271 to 270	14.5 14.5		0.0	1.5		10.000	120	42.109 0.0 0.004		Vel = 0.40	
270 to 269	14.5 14.5		0.0	1.5		10.000	120	42.113 0.0 0.003		Vel = 0.40	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
269 to 268	14.5 14.5		0.0 2.78	1.5 1.682			10.000 10.000	120 0.0003	42.116 0.0 0.003		Vel = 0.40	
268 to 234	14.5 14.5		0.0 2.78	1.5 1.682	T	9.9	13.000 9.900 22.900	120 0.0003	42.119 0.0 0.008		Vel = 0.40	
234			0.0 2.78						42.127		K Factor = 0.43	
204 to 272	14.5 14.5		2.09 2.09	1.5 1.682	T	9.9	113.250 9.900 123.150	120 0.0002	42.205 0.0 0.025		Vel = 0.30	
272 to 235	14.5 14.5		0.0 2.09	1.5 1.682	T	9.9	13.000 9.900 22.900	120 0.0002	42.230 0.0 0.004		Vel = 0.30	
235			0.0 2.09						42.234		K Factor = 0.32	
205 to 236	14.5 14.5		1.57 1.57	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	42.318 0.0 0.017		Vel = 0.23	
236			0.0 1.57						42.335		K Factor = 0.24	
206 to 237	14.5 14.5		1.07 1.07	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	42.447 0.0 0.009		Vel = 0.15	
237			0.0 1.07						42.456		K Factor = 0.16	
207 to 238	14.5 14.5		0.69 0.69	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	42.569 0.0 0.004		Vel = 0.10	
238			0.0 0.69						42.573		K Factor = 0.11	
208 to 239	14.5 14.5		0.43 0.43	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	42.684 0.0 0.002		Vel = 0.06	
239			0.0 0.43						42.686		K Factor = 0.07	
209 to 240	14.5 14.5		0.28 0.28	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	42.808 0.0 0.001		Vel = 0.04	
240			0.0 0.28						42.809		K Factor = 0.04	
210 to 241	14.5 14.5		0.30 0.3	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	42.922 0.0 0.001		Vel = 0.04	
241			0.0 0.30						42.923		K Factor = 0.05	
211 to 242	14.5 14.5		0.48 0.48	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	43.045 0.0 0.002		Vel = 0.07	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
242			0.0 0.48						43.047		K Factor = 0.07	
212 to 243	14.5 14.5		0.75 0.75	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0	43.148 0.0 0.004		Vel = 0.11	
243			0.0 0.75						43.152		K Factor = 0.11	
213 to 244	14.5 14.5		1.11 1.11	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	43.249 0.0 0.009		Vel = 0.16	
244			0.0 1.11						43.258		K Factor = 0.17	
214 to 245	14.5 14.5		1.56 1.56	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0001	43.348 0.0 0.017		Vel = 0.23	
245			0.0 1.56						43.365		K Factor = 0.24	
215 to 246	14.5 14.5		2.10 2.1	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0002	43.444 0.0 0.030		Vel = 0.30	
246			0.0 2.10						43.474		K Factor = 0.32	
216 to 247	14.5 14.5		2.74 2.74	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0003	43.536 0.0 0.048		Vel = 0.40	
247			0.0 2.74						43.584		K Factor = 0.42	
217 to 248	14.5 14.5		3.47 3.47	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0005	43.623 0.0 0.075		Vel = 0.50	
248			0.0 3.47						43.698		K Factor = 0.52	
218 to 249	14.5 14.5		4.33 4.33	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0008	43.706 0.0 0.113		Vel = 0.63	
249			0.0 4.33						43.819		K Factor = 0.65	
219 to 250	14.5 14.5		5.34 5.34	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0011	43.786 0.0 0.166		Vel = 0.77	
250			0.0 5.34						43.952		K Factor = 0.81	
220 to 251	14.5 14.5		6.50 6.5	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0016	43.860 0.0 0.238		Vel = 0.94	
251			0.0 6.50						44.098		K Factor = 0.98	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
221 to 252	14.5 14.5		7.61 7.61	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0022	43.914 0.0 0.319		Vel = 1.10	
252			0.0 7.61						44.233		K Factor = 1.14	
222 to 253	14.5 14.5		9.02 9.02	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0030	43.966 0.0 0.437		Vel = 1.30	
253			0.0 9.02						44.403		K Factor = 1.35	
223 to 254	14.5 14.5		10.52 10.52	1.5 1.682	2T	19.799	126.250 19.799 146.049	120 0.0040	44.003 0.0 0.581		Vel = 1.52	
254			0.0 10.52						44.584		K Factor = 1.58	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS3 SALES 4.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

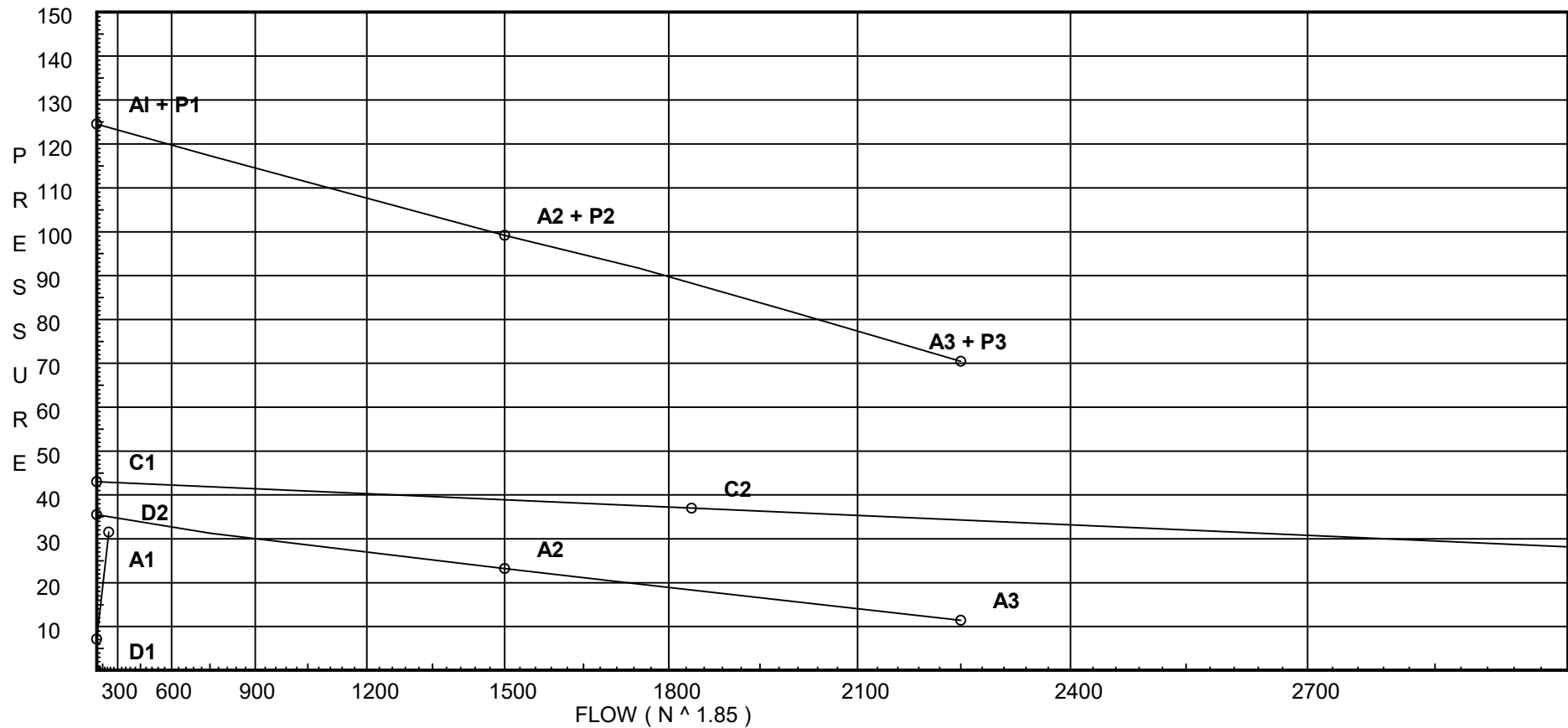
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 7.146
D2 - System Flow : 223.033
D2 - System Pressure : 31.529
Hose (Demand) :
D3 - System Demand : 223.033
Hose (Adj City) : 250
Safety Margin : 91.624



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.153	223.03	31.529
TEST	43.0	37	1839.0	42.513	473.03	42.513

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>	
DP01	14.0	16.8	11.0	55.72	0.01	130
EQ01	14.5		15.55			
301	14.5	14.13	15.55	55.72	K=K @ EQ01	
302	14.5		16.17			
303	14.5		20.73			
304	14.5		20.75			
305	14.5		20.79			
306	14.5		20.84			
307	14.5		20.9			
308	14.5		20.96			
309	14.5		21.02			
310	14.5		21.09			
311	14.5		21.16			
312	14.5		21.23			
313	14.5		21.3			
314	14.5		21.36			
315	14.5		21.43			
316	14.5		21.5			
317	14.5		21.58			
318	14.5		21.65			
319	14.5		21.74			
320	14.5		21.83			
321	14.5		21.94			
322	14.5		22.04			
323	14.5		22.17			
324	14.5		22.32			
325	14.5		22.36			
326	14.5		23.29			
327	14.5		23.93			
TR3	14.5		24.68			
BR3	2.83		30.23			
127	2.792		30.61			
128	2.0		30.99			
PO	1.08		31.53			
PI	1.08		34.47			
FLG	-5.0		37.17			
TEST	-2.0		42.51	250.0		
329	14.5	14.13	15.58	55.77	K=K @ EQ01	
330	14.5		16.73			
331	14.5		20.4			
332	14.5		20.42			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

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>
333	14.5		20.55		
334	14.5		20.66		
335	14.5		20.77		
336	14.5		20.87		
337	14.5		20.96		
338	14.5		21.05		
339	14.5		21.12		
340	14.5		21.2		
341	14.5		21.26		
342	14.5		21.32		
343	14.5		21.38		
344	14.5		21.43		
345	14.5		21.48		
346	14.5		21.52		
347	14.5		21.55		
348	14.5		21.58		
349	14.5		21.61		
350	14.5		21.62		
351	14.5		21.63		
352	14.5		21.63		
353	14.5		20.41		
354	14.5		20.41		
355	14.5		20.41		
356	14.5		20.72		
357	14.5		20.72		
358	14.5		20.72		
359	14.5		20.73		
360	14.5		16.74		
361	14.5	14.13	15.59	55.8	K=K @ EQ01
362	14.5	14.13	15.56	55.74	K=K @ EQ01
363	14.5		16.19		
364	14.5		20.66		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
DP01 to EQ01	14 14.5	16.80	55.72 55.72	1 1.049	T 5.0	0.500 5.000 5.500	120 0.8662	11.000 -0.217 4.764		Vel = 20.68	
EQ01			0.0 55.72					15.547		K Factor = 14.13	
301 to 302	14.5 14.5	14.13	46.64 46.64	1.5 1.682		10.000 10.000	120 0.0625	15.547 0.0 0.625		K = K @ EQ01 Vel = 6.73	
302 to 303	14.5 14.5		0.0 46.64	1.5 1.682	T 9.9	63.000 9.900 72.900	120 0.0625	16.172 0.0 4.559		Vel = 6.73	
303 to 304	14.5 14.5		25.09 71.73	4 4.26		10.000 10.000	120 0.0015	20.731 0.0 0.015		Vel = 1.61	
304 to 305	14.5 14.5		46.65 118.38	4 4.26		12.000 12.000	120 0.0038	20.746 0.0 0.045		Vel = 2.66	
305 to 306	14.5 14.5		6.82 125.2	4 4.26		11.000 11.000	120 0.0042	20.791 0.0 0.046		Vel = 2.82	
306 to 307	14.5 14.5		5.80 131.0	4 4.26		13.000 13.000	120 0.0046	20.837 0.0 0.060		Vel = 2.95	
307 to 308	14.5 14.5		4.77 135.77	4 4.26		12.500 12.500	120 0.0049	20.897 0.0 0.061		Vel = 3.06	
308 to 309	14.5 14.5		3.91 139.68	4 4.26		12.000 12.000	120 0.0052	20.958 0.0 0.062		Vel = 3.14	
309 to 310	14.5 14.5		3.23 142.91	4 4.26		13.000 13.000	120 0.0054	21.020 0.0 0.070		Vel = 3.22	
310 to 311	14.5 14.5		2.65 145.56	4 4.26		12.000 12.000	120 0.0055	21.090 0.0 0.066		Vel = 3.28	
311 to 312	14.5 14.5		2.30 147.86	4 4.26		13.000 13.000	120 0.0058	21.156 0.0 0.075		Vel = 3.33	
312 to 313	14.5 14.5		2.15 150.01	4 4.26		11.000 11.000	120 0.0058	21.231 0.0 0.064		Vel = 3.38	
313 to 314	14.5 14.5		2.22 152.23	4 4.26		11.000 11.000	120 0.0061	21.295 0.0 0.067		Vel = 3.43	
314 to 315	14.5 14.5		2.49 154.72	4 4.26		11.000 11.000	120 0.0062	21.362 0.0 0.068		Vel = 3.48	
315 to 316	14.5 14.5		2.93 157.65	4 4.26		11.000 11.000	120 0.0065	21.430 0.0 0.071		Vel = 3.55	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
316 to 317	14.5 14.5		3.50 161.15	4 4.26		11.000 11.000	120 0.0067	21.501 0.0 0.074		Vel = 3.63	
317 to 318	14.5 14.5		4.18 165.33	4 4.26		11.000 11.000	120 0.0070	21.575 0.0 0.077		Vel = 3.72	
318 to 319	14.5 14.5		4.98 170.31	4 4.26		11.330 11.330	120 0.0075	21.652 0.0 0.085		Vel = 3.83	
319 to 320	14.5 14.5		5.88 176.19	4 4.26		12.000 12.000	120 0.0079	21.737 0.0 0.095		Vel = 3.97	
320 to 321	14.5 14.5		6.93 183.12	4 4.26		12.670 12.670	120 0.0084	21.832 0.0 0.107		Vel = 4.12	
321 to 322	14.5 14.5		8.12 191.24	4 4.26		11.000 11.000	120 0.0093	21.939 0.0 0.102		Vel = 4.30	
322 to 323	14.5 14.5		9.22 200.46	4 4.26		13.000 13.000	120 0.0100	22.041 0.0 0.130		Vel = 4.51	
323 to 324	14.5 14.5		10.58 211.04	4 4.26		13.000 13.000	120 0.0111	22.171 0.0 0.144		Vel = 4.75	
324 to 325	14.5 14.5		11.99 223.03	4 4.26		3.500 3.500	120 0.0123	22.315 0.0 0.043		Vel = 5.02	
325 to 326	14.5 14.5		0.0 223.03	3 3.26	2E 18.815	1.780 18.815 20.595	120 0.0451	22.358 0.0 0.928		Vel = 8.57	
326 to 327	14.5 14.5		0.0 223.03	4 4.26	E 13.167	39.500 13.167 52.667	120 0.0122	23.286 0.0 0.645		Vel = 5.02	
327 to TR3	14.5 14.5		0.0 223.03	4 4.26	E 13.167	48.190 13.167 61.357	120 0.0122	23.931 0.0 0.751		Vel = 5.02	
TR3 to BR3	14.5 2.83		0.0 223.03	4 4.26	T G 26.334 2.633	11.670 28.967 40.637	120 0.0123	24.682 5.054 0.498		Vel = 5.02	
BR3 to 127	2.83 2.792		0.0 223.03	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0123	30.234 0.016 0.362		Vel = 5.02	
127 to 128	2.792 2		0.0 223.03	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0017	30.612 0.343 0.034		Vel = 2.25	
128 to PO	2 1.080		0.0 223.03	8 8.249	7E 147.988 T 41.108 B 14.094	31.833 256.043 287.876	120 0.0005	30.989 0.398 0.142		Vel = 1.34	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
S 52.853											
PO			0.0 223.03					31.529		K Factor = 39.72	
System Demand Pressure								31.529			
Safety Margin								91.624			
Continuation Pressure								123.153			
Pressure @ Pump Outlet								123.153			
Pressure From Pump Curve								-88.682			
Pressure @ Pump Inlet								34.471			
PI	1.080		0.0	8	5E	105.706	28.750	120	34.471		
to					G	4.698	110.404		2.633		
FLG	-5		223.03	8.249			139.154	0.0005	0.068	Vel = 1.34	
FLG	-5		0.0	8	Zfh	0.0	169.140	140	37.172		
to					2E	56.936	56.936		5.258	* * Fixed Loss = 6.558	
TEST	-2		223.03	8.27			226.076	0.0004	0.083	Vel = 1.33	
										Qa = 250.00	
TEST			250.00 473.03						42.513	K Factor = 72.55	
301	14.5		9.08	1.5			10.000	120	15.547		
to									0.0		
329	14.5		9.08	1.682			10.000	0.0031	0.031	Vel = 1.31	
329	14.5	14.13	55.77	1.5			10.000	120	15.578	K = K @ EQ01	
to									0.0		
330	14.5		64.85	1.682			10.000	0.1150	1.150	Vel = 9.36	
330	14.5		0.0	1.5	T	9.9	22.000	120	16.728		
to							9.900		0.0		
331	14.5		64.85	1.682			31.900	0.1151	3.671	Vel = 9.36	
331	14.5		-25.09	3			10.000	120	20.399		
to									0.0		
332	14.5		39.76	3.26			10.000	0.0019	0.019	Vel = 1.53	
332	14.5		64.89	3			12.000	120	20.418		
to									0.0		
333	14.5		104.65	3.26			12.000	0.0111	0.133	Vel = 4.02	
333	14.5		-6.81	3			11.000	120	20.551		
to									0.0		
334	14.5		97.84	3.26			11.000	0.0098	0.108	Vel = 3.76	
334	14.5		-5.81	3			13.000	120	20.659		
to									0.0		
335	14.5		92.03	3.26			13.000	0.0088	0.114	Vel = 3.54	
335	14.5		-4.77	3			12.500	120	20.773		
to									0.0		
336	14.5		87.26	3.26			12.500	0.0079	0.099	Vel = 3.35	
336	14.5		-3.91	3			12.000	120	20.872		
to									0.0		
337	14.5		83.35	3.26			12.000	0.0073	0.088	Vel = 3.20	
337	14.5		-3.23	3			13.000	120	20.960		
to									0.0		
338	14.5		80.12	3.26			13.000	0.0068	0.088	Vel = 3.08	
338	14.5		-2.65	3			12.000	120	21.048		
to									0.0		
339	14.5		77.47	3.26			12.000	0.0063	0.076	Vel = 2.98	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
339 to 340	14.5 14.5		-2.30 75.17	3 3.26			13.000 13.000	120 0.0060	21.124 0.0 0.078		Vel = 2.89	
340 to 341	14.5 14.5		-2.15 73.02	3 3.26			11.000 11.000	120 0.0057	21.202 0.0 0.063		Vel = 2.81	
341 to 342	14.5 14.5		-2.22 70.8	3 3.26			11.000 11.000	120 0.0055	21.265 0.0 0.060		Vel = 2.72	
342 to 343	14.5 14.5		-2.49 68.31	3 3.26			11.000 11.000	120 0.0050	21.325 0.0 0.055		Vel = 2.63	
343 to 344	14.5 14.5		-2.92 65.39	3 3.26			11.000 11.000	120 0.0046	21.380 0.0 0.051		Vel = 2.51	
344 to 345	14.5 14.5		-3.50 61.89	3 3.26			11.000 11.000	120 0.0043	21.431 0.0 0.047		Vel = 2.38	
345 to 346	14.5 14.5		-4.19 57.7	3 3.26			11.000 11.000	120 0.0036	21.478 0.0 0.040		Vel = 2.22	
346 to 347	14.5 14.5		-4.97 52.73	3 3.26			11.330 11.330	120 0.0032	21.518 0.0 0.036		Vel = 2.03	
347 to 348	14.5 14.5		-5.89 46.84	3 3.26			12.000 12.000	120 0.0025	21.554 0.0 0.030		Vel = 1.80	
348 to 349	14.5 14.5		-6.93 39.91	3 3.26			12.670 12.670	120 0.0018	21.584 0.0 0.023		Vel = 1.53	
349 to 350	14.5 14.5		-8.12 31.79	3 3.26			11.000 11.000	120 0.0013	21.607 0.0 0.014		Vel = 1.22	
350 to 351	14.5 14.5		-9.22 22.57	3 3.26			13.000 13.000	120 0.0006	21.621 0.0 0.008		Vel = 0.87	
351 to 352	14.5 14.5		-10.58 11.99	3 3.26			13.000 13.000	120 0.0002	21.629 0.0 0.003		Vel = 0.46	
352 to 324	14.5 14.5		0.0 11.99	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0051	21.632 0.0 0.683		Vel = 1.73	
324			0.0 11.99						22.315		K Factor = 2.54	
331 to 353	14.5 14.5		25.09 25.09	3 3.26			11.000 11.000	120 0.0008	20.399 0.0 0.009		Vel = 0.96	
353 to 354	14.5 14.5		-8.40 16.69	3 3.26			8.500 8.500	120 0.0004	20.408 0.0 0.003		Vel = 0.64	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
354 to 355	14.5 14.5		-8.35 8.34	3 3.26			5.500 5.500	120 0.0002	20.411 0.0 0.001			
355 to 356	14.5 14.5		0.0 8.34	1.5 1.682	2T	19.799	97.500 19.799 117.299	120 0.0026	20.412 0.0 0.303		Vel = 0.32	
356 to 357	14.5 14.5		0.0 8.34	4 4.26			5.500 5.500	120 0	20.715 0.0 0.0		Vel = 1.20	
357 to 358	14.5 14.5		8.35 16.69	4 4.26			8.500 8.500	120 0.0001	20.715 0.0 0.001		Vel = 0.19	
358 to 359	14.5 14.5		8.40 25.09	4 4.26	E T	13.167 26.334	25.500 39.501 65.001	120 0.0002	20.716 0.0 0.014		Vel = 0.38	
359 to 303	14.5 14.5		0.0 25.09	4 4.26			3.000 3.000	120 0.0003	20.730 0.0 0.001		Vel = 0.56	
303			0.0 25.09						20.731		K Factor = 5.51	
353 to 358	14.5 14.5		8.41 8.41	1.5 1.682	2T	19.799	97.500 19.799 117.299	120 0.0026	20.408 0.0 0.308		Vel = 1.21	
358			0.0 8.41						20.716		K Factor = 1.85	
332 to 360	14.5 14.5		-64.89 -64.89	1.5 1.682	T	9.9	22.000 9.900 31.900	120 -0.1152	20.418 0.0 -3.675		Vel = 9.37	
360 to 361	14.5 14.5		0.0 -64.89	1.5 1.682			10.000 10.000	120 -0.1152	16.743 0.0 -1.152		Vel = 9.37	
361 to 362	14.5 14.5	14.13	55.79 -9.1	1.5 1.682			10.000 10.000	120 -0.0031	15.591 0.0 -0.031		K = K @ EQ01	
362 to 363	14.5 14.5	14.13	55.75 46.65	1.5 1.682			10.000 10.000	120 0.0626	15.560 0.0 0.626		K = K @ EQ01	
363 to 304	14.5 14.5		0.0 46.65	1.5 1.682	T	9.9	63.000 9.900 72.900	120 0.0626	16.186 0.0 4.560		Vel = 6.74	
304			0.0 46.65						20.746		K Factor = 10.24	
354 to 357	14.5 14.5		8.35 8.35	1.5 1.682	2T	19.799	97.500 19.799 117.299	120 0.0026	20.411 0.0 0.304		Vel = 1.21	
357			0.0 8.35						20.715		K Factor = 1.83	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
333 to 364	14.5 14.5		6.82 6.82	1.5 1.682	T	9.9	52.000 9.900 61.900	120 0.0018	20.551 0.0 0.110		Vel = 0.98	
364 to 305	14.5 14.5		0.0 6.82	1.5 1.682	T	9.9	63.000 9.900 72.900	120 0.0018	20.661 0.0 0.130		Vel = 0.98	
305			0.0 6.82						20.791		K Factor = 1.50	
334 to 306	14.5 14.5		5.81 5.81	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0013	20.659 0.0 0.178		Vel = 0.84	
306			0.0 5.81						20.837		K Factor = 1.27	
335 to 307	14.5 14.5		4.77 4.77	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0009	20.773 0.0 0.124		Vel = 0.69	
307			0.0 4.77						20.897		K Factor = 1.04	
336 to 308	14.5 14.5		3.91 3.91	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0006	20.872 0.0 0.086		Vel = 0.56	
308			0.0 3.91						20.958		K Factor = 0.85	
337 to 309	14.5 14.5		3.23 3.23	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0004	20.960 0.0 0.060		Vel = 0.47	
309			0.0 3.23						21.020		K Factor = 0.70	
338 to 310	14.5 14.5		2.65 2.65	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0003	21.048 0.0 0.042		Vel = 0.38	
310			0.0 2.65						21.090		K Factor = 0.58	
339 to 311	14.5 14.5		2.30 2.3	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0002	21.124 0.0 0.032		Vel = 0.33	
311			0.0 2.30						21.156		K Factor = 0.50	
340 to 312	14.5 14.5		2.15 2.15	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0002	21.202 0.0 0.029		Vel = 0.31	
312			0.0 2.15						21.231		K Factor = 0.47	
341 to 313	14.5 14.5		2.22 2.22	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0002	21.265 0.0 0.030		Vel = 0.32	
			0.0									

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
313			2.22						21.295		K Factor = 0.48	
342 to 314	14.5 14.5		2.49	1.5	2T	19.799	115.000 19.799 134.799	120	21.325 0.0			
			2.49	1.682				0.0003	0.037		Vel = 0.36	
314			0.0 2.49						21.362		K Factor = 0.54	
343 to 315	14.5 14.5		2.92	1.5	2T	19.799	115.000 19.799 134.799	120	21.380 0.0			
			2.92	1.682				0.0004	0.050		Vel = 0.42	
315			0.0 2.92						21.430		K Factor = 0.63	
344 to 316	14.5 14.5		3.50	1.5	2T	19.799	115.000 19.799 134.799	120	21.431 0.0			
			3.5	1.682				0.0005	0.070		Vel = 0.51	
316			0.0 3.50						21.501		K Factor = 0.75	
345 to 317	14.5 14.5		4.19	1.5	2T	19.799	115.000 19.799 134.799	120	21.478 0.0			
			4.19	1.682				0.0007	0.097		Vel = 0.60	
317			0.0 4.19						21.575		K Factor = 0.90	
346 to 318	14.5 14.5		4.98	1.5	2T	19.799	115.000 19.799 134.799	120	21.518 0.0			
			4.98	1.682				0.0010	0.134		Vel = 0.72	
318			0.0 4.98						21.652		K Factor = 1.07	
347 to 319	14.5 14.5		5.88	1.5	2T	19.799	115.000 19.799 134.799	120	21.554 0.0			
			5.88	1.682				0.0014	0.183		Vel = 0.85	
319			0.0 5.88						21.737		K Factor = 1.26	
348 to 320	14.5 14.5		6.93	1.5	2T	19.799	115.000 19.799 134.799	120	21.584 0.0			
			6.93	1.682				0.0018	0.248		Vel = 1.00	
320			0.0 6.93						21.832		K Factor = 1.48	
349 to 321	14.5 14.5		8.12	1.5	2T	19.799	115.000 19.799 134.799	120	21.607 0.0			
			8.12	1.682				0.0025	0.332		Vel = 1.17	
321			0.0 8.12						21.939		K Factor = 1.73	
350 to 322	14.5 14.5		9.22	1.5	2T	19.799	115.000 19.799 134.799	120	21.621 0.0			
			9.22	1.682				0.0031	0.420		Vel = 1.33	
322			0.0 9.22						22.041		K Factor = 1.96	
351 to 323	14.5 14.5		10.58	1.5	2T	19.799	115.000 19.799 134.799	120	21.629 0.0			
			10.58	1.682				0.0040	0.542		Vel = 1.53	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
323			0.0 10.58						22.171		K Factor =	2.25



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS3 SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

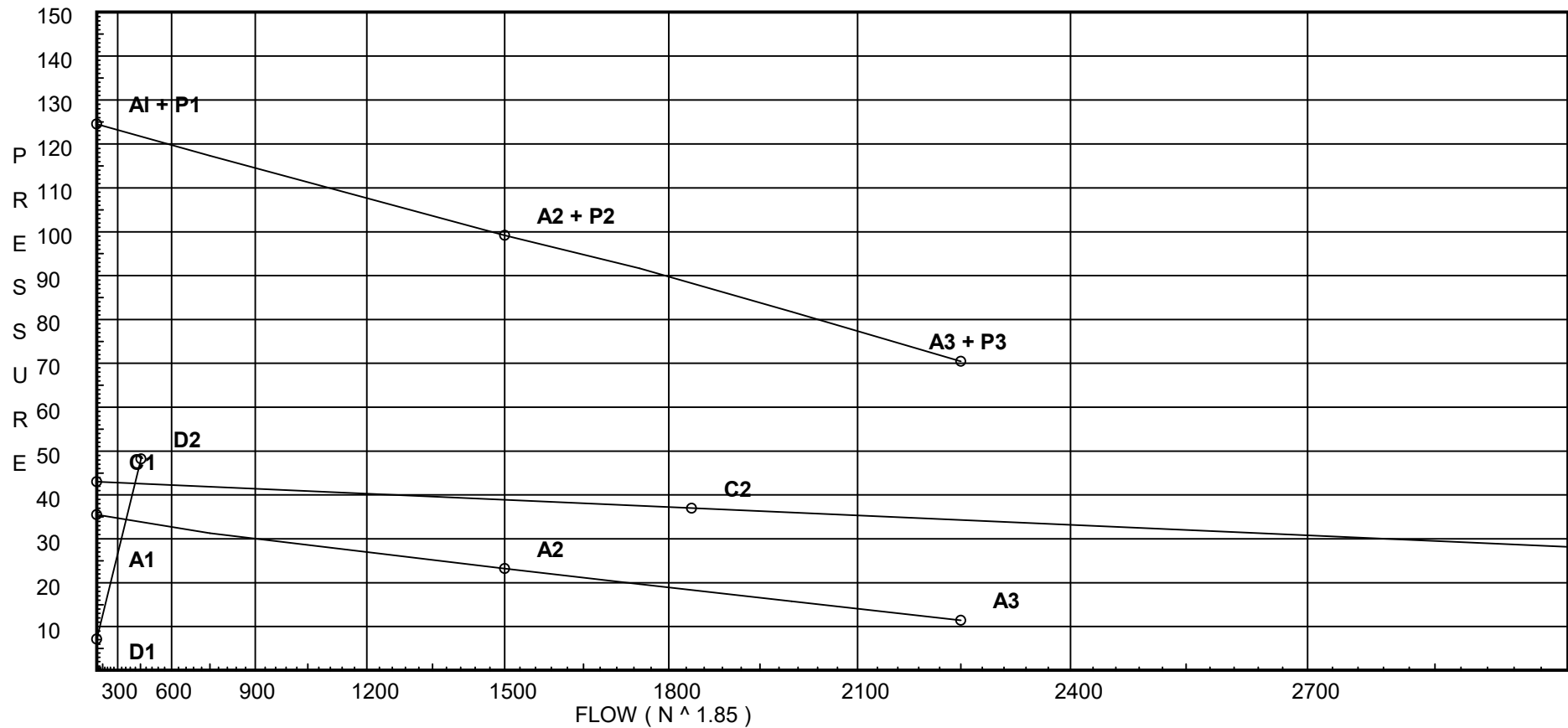
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 7.146
D2 - System Flow : 452.212
D2 - System Pressure : 48.207
Hose (Demand) :
D3 - System Demand : 452.212
Hose (Adj City) : 250
Safety Margin : 72.715



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.922	452.21	48.207
TEST	43.0	37	1839.0	41.989	702.21	41.989

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>	
DP01	14.0	16.8	8.0	47.52	0.01	130
EQ01	14.5		11.33			
301	14.5	14.12	11.33	47.52	K=K @ EQ01	
302	14.5	14.12	11.64	48.16	K=K @ EQ01	
303	14.5		24.05			
304	14.5		24.09			
305	14.5		24.23			
306	14.5		24.39			
307	14.5		24.6			
308	14.5		24.82			
309	14.5		25.04			
310	14.5		25.3			
311	14.5		25.54			
312	14.5		25.81			
313	14.5		26.05			
314	14.5		26.3			
315	14.5		26.55			
316	14.5		26.81			
317	14.5		27.08			
318	14.5		27.37			
319	14.5		27.68			
320	14.5		28.03			
321	14.5		28.43			
322	14.5		28.8			
323	14.5		29.29			
324	14.5		29.82			
325	14.5		29.98			
326	14.5		33.41			
327	14.5		35.79			
TR3	14.5		38.57			
BR3	2.83		45.46			
127	2.792		46.82			
128	2.0		47.29			
PO	1.08		48.21			
PI	1.08		33.1			
FLG	-5.0		35.98			
TEST	-2.0		41.99	250.0		
329	14.5	14.12	11.41	47.69	K=K @ EQ01	
330	14.5	14.12	12.51	49.93	K=K @ EQ01	
331	14.5		22.8			
332	14.5		22.84			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

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>
333	14.5		23.18		
334	14.5		23.61		
335	14.5		24.05		
336	14.5		24.43		
337	14.5		24.77		
338	14.5		25.11		
339	14.5		25.4		
340	14.5		25.69		
341	14.5		25.93		
342	14.5		26.15		
343	14.5		26.35		
344	14.5		26.54		
345	14.5		26.72		
346	14.5		26.87		
347	14.5		27.0		
348	14.5		27.11		
349	14.5		27.2		
350	14.5		27.25		
351	14.5		27.28		
352	14.5		27.29		
353	14.5		22.83		
354	14.5		22.84		
355	14.5		22.84		
356	14.5		23.99		
357	14.5		23.99		
358	14.5		23.99		
359	14.5		24.04		
360	14.5	14.12	12.54	49.98	K=K @ EQ01
361	14.5	14.12	11.44	47.74	K=K @ EQ01
362	14.5	14.12	11.35	47.56	K=K @ EQ01
363	14.5	14.12	11.66	48.21	K=K @ EQ01
364	14.5	14.12	21.48	65.42	K=K @ EQ01

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
DP01 to EQ01	14 14.5	16.80	47.52 47.52	1 1.049	T 5.0	0.500 5.000 5.500	120 0.6453	8.000 -0.217 3.549		Vel = 17.64	
EQ01			0.0 47.52					11.332		K Factor = 14.12	
301 to 302	14.5 14.5	14.12	31.96	1.5		10.000	120	11.332 0.0		K = K @ EQ01	
302 to 303	14.5 14.5	14.12	31.96 48.17	1.682 1.5	T 9.9	10.000 63.000 9.900 72.900	0.0310 120	0.310 11.642 0.0		Vel = 4.61 K = K @ EQ01	
303 to 304	14.5 14.5		80.13 51.47	1.682 4		10.000	0.1702 120	12.406 24.048 0.0		Vel = 11.57	
304 to 305	14.5 14.5		131.6 80.20	4.26 4		10.000 12.000	0.0046 120	0.046 24.094 0.0		Vel = 2.96	
305 to 306	14.5 14.5		211.8 35.49	4.26 4		12.000 11.000	0.0111 120	0.133 24.227 0.0		Vel = 4.77	
306 to 307	14.5 14.5		247.29 12.92	4.26 4		11.000 13.000	0.0148 120	0.163 24.390 0.0		Vel = 5.57	
307 to 308	14.5 14.5		260.21 10.69	4.26 4		13.000 12.500	0.0163 120	0.212 24.602 0.0		Vel = 5.86	
308 to 309	14.5 14.5		270.9 8.82	4.26 4		12.500 12.000	0.0175 120	0.219 24.821 0.0		Vel = 6.10	
309 to 310	14.5 14.5		279.72 7.32	4.26 4		12.000 13.000	0.0186 120	0.223 25.044 0.0		Vel = 6.30	
310 to 311	14.5 14.5		287.04 6.05	4.26 4		13.000 12.000	0.0195 120	0.254 25.298 0.0		Vel = 6.46	
311 to 312	14.5 14.5		293.09 5.21	4.26 4		12.000 13.000	0.0203 120	0.244 25.542 0.0		Vel = 6.60	
312 to 313	14.5 14.5		298.3 4.77	4.26 4		13.000 11.000	0.0209 120	0.272 25.814 0.0		Vel = 6.71	
313 to 314	14.5 14.5		303.07 4.81	4.26 4		11.000 11.000	0.0216 120	0.238 26.052 0.0		Vel = 6.82	
314 to 315	14.5 14.5		307.88 5.27	4.26 4		11.000 11.000	0.0222 120	0.244 26.296 0.0		Vel = 6.93	
315 to 316	14.5 14.5		313.15 6.09	4.26 4		11.000 11.000	0.0230 120	0.253 26.549 0.0		Vel = 7.05	
			319.24	4.26		11.000	0.0237	0.261		Vel = 7.19	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
316 to 317	14.5 14.5		7.19 326.43	4 4.26		11.000 11.000	120 0.0248	26.810 0.0 0.273		Vel = 7.35	
317 to 318	14.5 14.5		8.57 335.0	4 4.26		11.000 11.000	120 0.0260	27.083 0.0 0.286		Vel = 7.54	
318 to 319	14.5 14.5		10.14 345.14	4 4.26		11.330 11.330	120 0.0274	27.369 0.0 0.311		Vel = 7.77	
319 to 320	14.5 14.5		11.98 357.12	4 4.26		12.000 12.000	120 0.0292	27.680 0.0 0.351		Vel = 8.04	
320 to 321	14.5 14.5		14.09 371.21	4 4.26		12.670 12.670	120 0.0314	28.031 0.0 0.398		Vel = 8.36	
321 to 322	14.5 14.5		16.49 387.7	4 4.26		11.000 11.000	120 0.0341	28.429 0.0 0.375		Vel = 8.73	
322 to 323	14.5 14.5		18.71 406.41	4 4.26		13.000 13.000	120 0.0371	28.804 0.0 0.482		Vel = 9.15	
323 to 324	14.5 14.5		21.47 427.88	4 4.26		13.000 13.000	120 0.0409	29.286 0.0 0.532		Vel = 9.63	
324 to 325	14.5 14.5		24.33 452.21	4 4.26		3.500 3.500	120 0.0451	29.818 0.0 0.158		Vel = 10.18	
325 to 326	14.5 14.5		0.0 452.21	3 3.26	2E 18.815	1.780 18.815 20.595	120 0.1666	29.976 0.0 3.431		Vel = 17.38	
326 to 327	14.5 14.5		0.0 452.21	4 4.26	E 13.167	39.500 13.167 52.667	120 0.0453	33.407 0.0 2.385		Vel = 10.18	
327 to TR3	14.5 14.5		0.0 452.21	4 4.26	E 13.167	48.190 13.167 61.357	120 0.0453	35.792 0.0 2.777		Vel = 10.18	
TR3 to BR3	14.5 2.83		0.0 452.21	4 4.26	T G 26.334 2.633	11.670 28.967 40.637	120 0.0453	38.569 5.054 1.840		Vel = 10.18	
BR3 to 127	2.83 2.792		0.0 452.21	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0453	45.463 0.016 1.336		Vel = 10.18	
127 to 128	2.792 2		0.0 452.21	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0065	46.815 0.343 0.129		Vel = 4.57	
128 to PO	2 1.080		0.0 452.21	8 8.249	7E 147.988 T 41.108 B 14.094	31.833 256.043 287.876	120 0.0018	47.287 0.398 0.522		Vel = 2.71	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
S 52.853												
PO			0.0 452.21						48.207		K Factor = 65.13	
System Demand Pressure									48.207			
Safety Margin									72.715			
Continuation Pressure									120.922			
Pressure @ Pump Outlet									120.922			
Pressure From Pump Curve									-87.823			
Pressure @ Pump Inlet									33.099			
PI	1.080		0.0	8	5E	105.706	28.750	120	33.099			
to					G	4.698	110.404		2.633			
FLG	-5		452.21	8.249			139.154	0.0018	0.252	Vel =	2.71	
FLG	-5		0.0	8	Zfh	0.0	169.140	140	35.984			
to					2E	56.936	56.936		5.701	* * Fixed Loss = 7		
TEST	-2		452.21	8.27			226.076	0.0013	0.304	Vel =	2.70	
										Qa = 250.00		
TEST			250.00 702.21						41.989	K Factor = 108.37		
301	14.5		15.56	1.5			10.000	120	11.332			
to									0.0			
329	14.5		15.56	1.682			10.000	0.0082	0.082	Vel =	2.25	
329	14.5	14.12	47.68	1.5			10.000	120	11.414	K = K @ EQ01		
to									0.0			
330	14.5		63.24	1.682			10.000	0.1098	1.098	Vel =	9.13	
330	14.5	14.12	49.94	1.5	T	9.9	22.000	120	12.512	K = K @ EQ01		
to							9.900		0.0			
331	14.5		113.18	1.682			31.900	0.3224	10.283	Vel =	16.34	
331	14.5		-51.47	3			10.000	120	22.795			
to									0.0			
332	14.5		61.71	3.26			10.000	0.0042	0.042	Vel =	2.37	
332	14.5		113.28	3			12.000	120	22.837			
to									0.0			
333	14.5		174.99	3.26			12.000	0.0288	0.345	Vel =	6.73	
333	14.5		29.93	3			11.000	120	23.182			
to									0.0			
334	14.5		204.92	3.26			11.000	0.0385	0.424	Vel =	7.88	
334	14.5		-12.92	3			13.000	120	23.606			
to									0.0			
335	14.5		192.0	3.26			13.000	0.0342	0.444	Vel =	7.38	
335	14.5		-10.68	3			12.500	120	24.050			
to									0.0			
336	14.5		181.32	3.26			12.500	0.0307	0.384	Vel =	6.97	
336	14.5		-8.83	3			12.000	120	24.434			
to									0.0			
337	14.5		172.49	3.26			12.000	0.0280	0.336	Vel =	6.63	
337	14.5		-7.32	3			13.000	120	24.770			
to									0.0			
338	14.5		165.17	3.26			13.000	0.0258	0.336	Vel =	6.35	
338	14.5		-6.05	3			12.000	120	25.106			
to									0.0			
339	14.5		159.12	3.26			12.000	0.0242	0.290	Vel =	6.12	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
339 to 340	14.5 14.5		-5.21 153.91	3 3.26			13.000 13.000	120 0.0226	25.396 0.0 0.294		Vel = 5.92	
340 to 341	14.5 14.5		-4.77 149.14	3 3.26			11.000 11.000	120 0.0215	25.690 0.0 0.236		Vel = 5.73	
341 to 342	14.5 14.5		-4.81 144.33	3 3.26			11.000 11.000	120 0.0201	25.926 0.0 0.221		Vel = 5.55	
342 to 343	14.5 14.5		-5.27 139.06	3 3.26			11.000 11.000	120 0.0188	26.147 0.0 0.207		Vel = 5.35	
343 to 344	14.5 14.5		-6.08 132.98	3 3.26			11.000 11.000	120 0.0174	26.354 0.0 0.191		Vel = 5.11	
344 to 345	14.5 14.5		-7.20 125.78	3 3.26			11.000 11.000	120 0.0155	26.545 0.0 0.171		Vel = 4.83	
345 to 346	14.5 14.5		-8.56 117.22	3 3.26			11.000 11.000	120 0.0137	26.716 0.0 0.151		Vel = 4.51	
346 to 347	14.5 14.5		-10.15 107.07	3 3.26			11.330 11.330	120 0.0116	26.867 0.0 0.131		Vel = 4.12	
347 to 348	14.5 14.5		-11.98 95.09	3 3.26			12.000 12.000	120 0.0093	26.998 0.0 0.112		Vel = 3.66	
348 to 349	14.5 14.5		-14.09 81.0	3 3.26			12.670 12.670	120 0.0069	27.110 0.0 0.088		Vel = 3.11	
349 to 350	14.5 14.5		-16.48 64.52	3 3.26			11.000 11.000	120 0.0045	27.198 0.0 0.050		Vel = 2.48	
350 to 351	14.5 14.5		-18.72 45.8	3 3.26			13.000 13.000	120 0.0024	27.248 0.0 0.031		Vel = 1.76	
351 to 352	14.5 14.5		-21.47 24.33	3 3.26			13.000 13.000	120 0.0008	27.279 0.0 0.010		Vel = 0.94	
352 to 324	14.5 14.5		0.0 24.33	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0188	27.289 0.0 2.529		Vel = 3.51	
324			0.0 24.33						29.818		K Factor = 4.46	
331 to 353	14.5 14.5		51.47 51.47	3 3.26			11.000 11.000	120 0.0030	22.795 0.0 0.033		Vel = 1.98	
353 to 354	14.5 14.5		-17.25 34.22	3 3.26			8.500 8.500	120 0.0014	22.828 0.0 0.012		Vel = 1.32	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
354 to 355	14.5 14.5		-17.12 17.1	3 3.26		5.500 5.500	120 0.0004	22.840 0.0 0.002		Vel = 0.66	
355 to 356	14.5 14.5		0.0 17.1	1.5 1.682	2T 19.799	97.500 19.799 117.299	120 0.0098	22.842 0.0 1.146		Vel = 2.47	
356 to 357	14.5 14.5		0.0 17.1	4 4.26		5.500 5.500	120 0.0002	23.988 0.0 0.001		Vel = 0.38	
357 to 358	14.5 14.5		17.12 34.22	4 4.26		8.500 8.500	120 0.0004	23.989 0.0 0.003		Vel = 0.77	
358 to 359	14.5 14.5		17.25 51.47	4 4.26	E T 13.167 26.334	25.500 39.501 65.001	120 0.0008	23.992 0.0 0.053		Vel = 1.16	
359 to 303	14.5 14.5		0.0 51.47	4 4.26		3.000 3.000	120 0.0010	24.045 0.0 0.003		Vel = 1.16	
303			0.0 51.47					24.048		K Factor = 10.50	
353 to 358	14.5 14.5		17.24 17.24	1.5 1.682	2T 19.799	97.500 19.799 117.299	120 0.0099	22.828 0.0 1.164		Vel = 2.49	
358			0.0 17.24					23.992		K Factor = 3.52	
332 to 360	14.5 14.5		-113.28 -113.28	1.5 1.682	T 9.9	22.000 9.900 31.900	120 -0.3229	22.837 0.0 -10.301		Vel = 16.36	
360 to 361	14.5 14.5	14.12	49.98 -63.3	1.5 1.682		10.000 10.000	120 -0.1100	12.536 0.0 -1.100		K = K @ EQ01	
361 to 362	14.5 14.5	14.12	47.73 -15.57	1.5 1.682		10.000 10.000	120 -0.0082	11.436 0.0 -0.082		K = K @ EQ01	
362 to 363	14.5 14.5	14.12	47.57 32.0	1.5 1.682		10.000 10.000	120 0.0311	11.354 0.0 0.311		K = K @ EQ01	
363 to 304	14.5 14.5	14.12	48.21 80.21	1.5 1.682	T 9.9	63.000 9.900 72.900	120 0.1705	11.665 0.0 12.429		K = K @ EQ01	
304			0.0 80.21					24.094		K Factor = 16.34	
354 to 357	14.5 14.5		17.12 17.12	1.5 1.682	2T 19.799	97.500 19.799 117.299	120 0.0098	22.840 0.0 1.149		Vel = 2.47	
357			0.0 17.12					23.989		K Factor = 3.50	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
333 to 364	14.5 14.5		-29.93 -29.93	1.5 1.682	T	9.9 52.000 9.900 61.900	120 -0.0275	23.182 0.0 -1.704		Vel = 4.32	
364 to 305	14.5 14.5	14.12	65.41 35.48	1.5 1.682	T	9.9 63.000 9.900 72.900	120 0.0377	21.478 0.0 2.749		K = K @ EQ01 Vel = 5.12	
305			0.0 35.48					24.227		K Factor = 7.21	
334 to 306	14.5 14.5		12.92 12.92	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0058	23.606 0.0 0.784		Vel = 1.87	
306			0.0 12.92					24.390		K Factor = 2.62	
335 to 307	14.5 14.5		10.69 10.69	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0041	24.050 0.0 0.552		Vel = 1.54	
307			0.0 10.69					24.602		K Factor = 2.16	
336 to 308	14.5 14.5		8.82 8.82	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0029	24.434 0.0 0.387		Vel = 1.27	
308			0.0 8.82					24.821		K Factor = 1.77	
337 to 309	14.5 14.5		7.33 7.33	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0020	24.770 0.0 0.274		Vel = 1.06	
309			0.0 7.33					25.044		K Factor = 1.46	
338 to 310	14.5 14.5		6.04 6.04	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0014	25.106 0.0 0.192		Vel = 0.87	
310			0.0 6.04					25.298		K Factor = 1.20	
339 to 311	14.5 14.5		5.22 5.22	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0011	25.396 0.0 0.146		Vel = 0.75	
311			0.0 5.22					25.542		K Factor = 1.03	
340 to 312	14.5 14.5		4.77 4.77	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0009	25.690 0.0 0.124		Vel = 0.69	
312			0.0 4.77					25.814		K Factor = 0.94	
341 to 313	14.5 14.5		4.81 4.81	1.5 1.682	2T	19.799 115.000 19.799 134.799	120 0.0009	25.926 0.0 0.126		Vel = 0.69	
			0.0								

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
313			4.81						26.052		K Factor = 0.94	
342 to 314	14.5 14.5		5.27 5.27	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0011	26.147 0.0 0.149		Vel = 0.76	
314			0.0 5.27						26.296		K Factor = 1.03	
343 to 315	14.5 14.5		6.08 6.08	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0014	26.354 0.0 0.195		Vel = 0.88	
315			0.0 6.08						26.549		K Factor = 1.18	
344 to 316	14.5 14.5		7.20 7.2	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0020	26.545 0.0 0.265		Vel = 1.04	
316			0.0 7.20						26.810		K Factor = 1.39	
345 to 317	14.5 14.5		8.56 8.56	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0027	26.716 0.0 0.367		Vel = 1.24	
317			0.0 8.56						27.083		K Factor = 1.64	
346 to 318	14.5 14.5		10.15 10.15	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0037	26.867 0.0 0.502		Vel = 1.47	
318			0.0 10.15						27.369		K Factor = 1.94	
347 to 319	14.5 14.5		11.98 11.98	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0051	26.998 0.0 0.682		Vel = 1.73	
319			0.0 11.98						27.680		K Factor = 2.28	
348 to 320	14.5 14.5		14.09 14.09	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0068	27.110 0.0 0.921		Vel = 2.03	
320			0.0 14.09						28.031		K Factor = 2.66	
349 to 321	14.5 14.5		16.49 16.49	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0091	27.198 0.0 1.231		Vel = 2.38	
321			0.0 16.49						28.429		K Factor = 3.09	
350 to 322	14.5 14.5		18.71 18.71	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0115	27.248 0.0 1.556		Vel = 2.70	
322			0.0 18.71						28.804		K Factor = 3.49	
351 to 323	14.5 14.5		21.48 21.48	1.5 1.682	2T	19.799	115.000 19.799 134.799	120 0.0149	27.279 0.0 2.007		Vel = 3.10	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
323			0.0 21.48						29.286		K Factor =	3.97

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
302	303	43.000	330	331	42.000
363	304	43.000	332	360	42.000
364	305	43.000	333	364	72.000
302	303	63.000	330	331	22.000
363	304	63.000	332	360	22.000
364	305	63.000	333	364	52.000

		Flow	Safety	Pressure
		Required	Margin	Differential
Left	30.000	703.013	71.986	-0.294
Left	20.000	702.783	71.693	0.000
Left	10.000	702.552	71.926	-0.233
Area Calculated		702.212	72.715	-1.023
Right	10.000	701.701	74.115	-2.422

Typical Distance Between Heads = 10.000

Split Point Used in Worst Area Peaked = 301

Split Point Used in Area Calculated = 301



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GM SALES 4.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

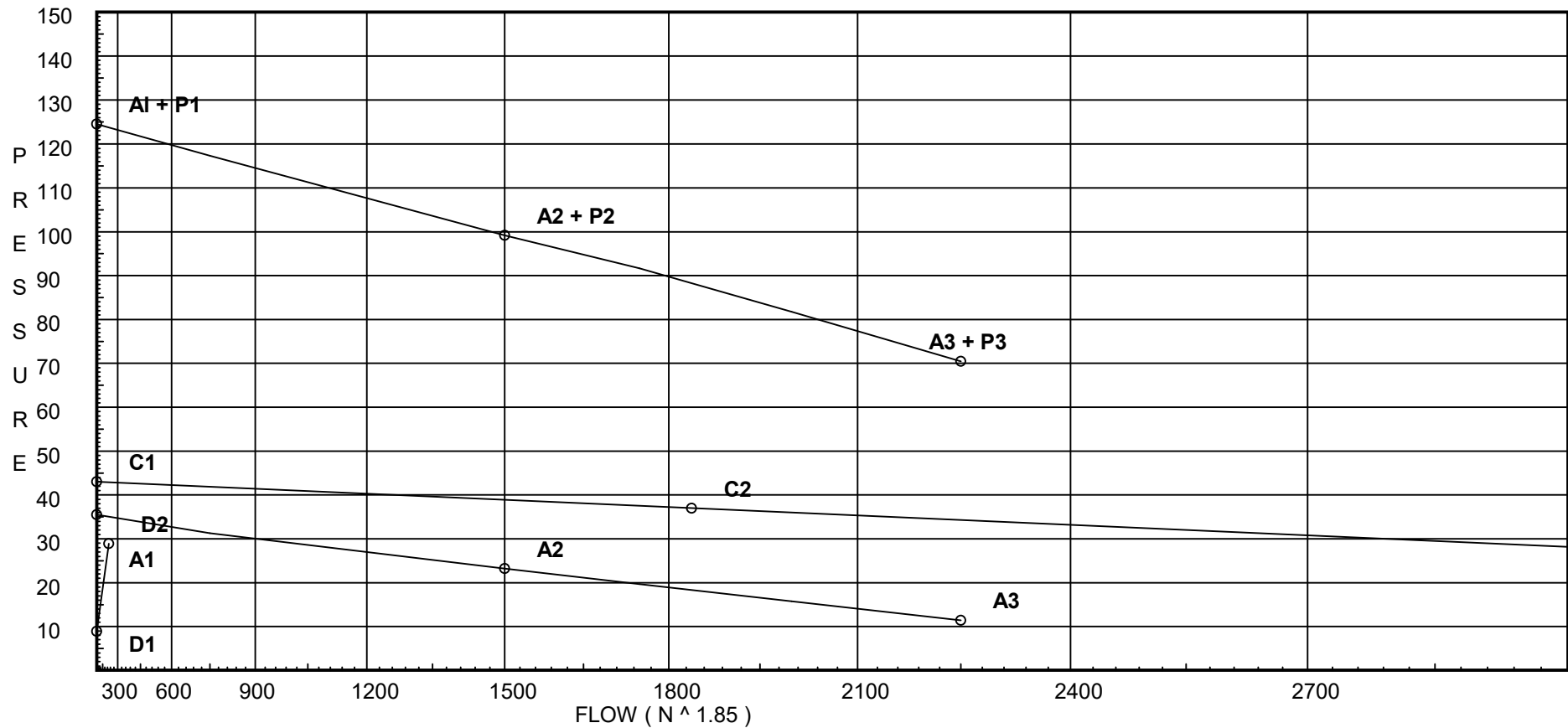
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.939
D2 - System Flow : 223.247
D2 - System Pressure : 28.900
Hose (Demand) :
D3 - System Demand : 223.247
Hose (Adj City) : 250
Safety Margin : 94.251



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.151	223.25	28.9
TEST	43.0	37	1839.0	42.513	473.25	42.513

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>	
DP03	14.0	16.8	11.0	55.72	0.01	130
EQ03	18.64		17.34			
DP01	14.0	16.8	11.0	55.72	0.01	130
EQ01	18.36		17.22			
DP02	14.0	16.8	11.0	55.72	0.01	130
EQ02	18.78		17.4			
DP04	14.0	16.8	11.0	55.72	0.01	130
EQ04	18.51		17.28			
491	18.64	13.38	17.34	55.72	K=K @ EQ03	
492	18.78		17.55			
479	19.53		18.91			
429	18.69		19.6			
428	18.69		19.61			
427	18.69		19.62			
426	18.69		19.64			
425	18.69		19.65			
424	18.69		19.66			
423	18.69		19.66			
422	18.69		19.67			
421	18.69		19.68			
420	18.69		19.68			
419	18.69		19.68			
452	18.69		19.69			
451	18.69		19.69			
450	18.69		19.69			
449	18.69		19.69			
448	19.52		19.34			
447	19.52		19.34			
446	19.52		19.34			
445	19.52		19.34			
484	18.86		19.63			
483	18.73		19.68			
485	18.63		19.73			
486	18.49		19.79			
444	17.59		20.19			
443	17.59		20.19			
442	17.59		20.19			
441	17.59		20.19			
440	17.59		20.19			
439	17.59		20.19			
438	17.59		20.19			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
437	17.59		20.19		
436	17.59		20.19		
435	17.59		20.19		
403	17.59		20.19		
404	17.59		20.19		
405	17.59		20.19		
406	17.59		20.19		
407	17.59		20.19		
408	17.59		20.19		
409	17.59		20.19		
410	17.59		20.2		
411	17.59		20.2		
412	17.59		20.2		
413	17.59		20.2		
414	17.59		20.21		
415	17.59		20.22		
416	17.59		20.29		
417	17.41		20.43		
TR4	17.24		21.25		
BR4	2.83		27.59		
BR3	2.83		27.6		
127	2.792		27.98		
128	2.0		28.36		
PO	1.08		28.9		
PI	1.08		34.47		
FLG	-5.0		37.17		
TEST	-2.0		42.51	250.0	
493	18.51	13.4	17.4	55.9	K=K @ EQ04
494	18.36		17.79		
430	18.69		19.6		
431	18.69		19.6		
432	18.69		19.6		
433	18.69		19.6		
434	19.53		19.26		
480	19.53		18.91		
495	18.78		17.55		
496	18.64	13.38	17.34	55.72	K=K @ EQ03
497	18.51	13.4	17.4	55.9	K=K @ EQ04
498	18.36		17.79		
481	19.53		19.24		
499	18.36		19.83		
482	19.53		19.25		
478	19.53		19.25		
477	19.53		19.27		
476	19.53		19.28		
475	19.53		19.29		
474	19.53		19.3		
473	19.53		19.3		
472	17.6		20.18		
471	19.53		19.31		
470	19.53		19.32		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
469	19.53		19.32		
418	19.53		19.32		
402	17.6		20.18		
455	19.53		19.32		
454	17.6		20.18		
460	19.53		19.33		
459	17.6		20.18		
467	19.53		19.33		
468	19.53		19.33		
487	18.86		19.63		
488	18.73		19.68		
489	18.63		19.73		
490	18.49		19.79		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
DP03 to EQ03	14 18.64	16.80	55.72 55.72	1 1.049	T	5.0	4.640 5.000 9.640	120 0.8662	11.000 -2.010 8.350		Vel = 20.68	
EQ03			0.0 55.72						17.340		K Factor = 13.38	
DP01 to EQ01	14 18.36	16.80	55.72 55.72	1 1.049	T	5.0	4.360 5.000 9.360	120 0.8661	11.000 -1.888 8.107		Vel = 20.68	
EQ01			0.0 55.72						17.219		K Factor = 13.43	
DP02 to EQ02	14 18.78	16.80	55.72 55.72	1 1.049	T	5.0	4.780 5.000 9.780	120 0.8662	11.000 -2.070 8.471		Vel = 20.68	
EQ02			0.0 55.72						17.401		K Factor = 13.36	
DP04 to EQ04	14 18.51	16.80	55.72 55.72	1 1.049	T	5.0	4.510 5.000 9.510	120 0.8661	11.000 -1.953 8.237		Vel = 20.68	
EQ04			0.0 55.72						17.284		K Factor = 13.40	
491 to 492	18.64 18.78	13.38	54.33 54.33	2 2.157			11.000 11.000	120 0.0247	17.340 -0.061 0.272		K = K @ EQ03 Vel = 4.77	
492 to 479	18.78 19.53		0.0 54.33	2 2.157	E	6.153	62.000 6.153 68.153	120 0.0247	17.551 -0.325 1.683		Vel = 4.77	
479 to 429	19.53 18.69		0.0 54.33	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0247	18.909 0.364 0.325		Vel = 4.77	
429 to 428	18.69 18.69		24.27 78.6	4 4.26			6.170 6.170	120 0.0018	19.598 0.0 0.011		Vel = 1.77	
428 to 427	18.69 18.69		-7.25 71.35	4 4.26			10.500 10.500	120 0.0014	19.609 0.0 0.015		Vel = 1.61	
427 to 426	18.69 18.69		-6.61 64.74	4 4.26			10.500 10.500	120 0.0012	19.624 0.0 0.013		Vel = 1.46	
426 to 425	18.69 18.69		-6.04 58.7	4 4.26			10.500 10.500	120 0.0010	19.637 0.0 0.011		Vel = 1.32	
425 to 424	18.69 18.69		-5.52 53.18	4 4.26			10.500 10.500	120 0.0009	19.648 0.0 0.009		Vel = 1.20	
424 to 423	18.69 18.69		-5.06 48.12	4 4.26			10.500 10.500	120 0.0008	19.657 0.0 0.008		Vel = 1.08	
423 to 422	18.69 18.69		-4.72 43.4	4 4.26			10.500 10.500	120 0.0006	19.665 0.0 0.006		Vel = 0.98	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
422 to 421	18.69 18.69		-4.27 39.13	4 4.26			10.500 10.500	120 0.0005	19.671 0.0 0.005		Vel = 0.88	
421 to 420	18.69 18.69		-3.95 35.18	4 4.26			10.500 10.500	120 0.0004	19.676 0.0 0.004		Vel = 0.79	
420 to 419	18.69 18.69		-3.66 31.52	4 4.26			10.500 10.500	120 0.0004	19.680 0.0 0.004		Vel = 0.71	
419 to 452	18.69 18.69		-3.40 28.12	4 4.26			10.500 10.500	120 0.0002	19.684 0.0 0.002		Vel = 0.63	
452 to 451	18.69 18.69		-3.20 24.92	4 4.26			10.500 10.500	120 0.0003	19.686 0.0 0.003		Vel = 0.56	
451 to 450	18.69 18.69		-3.02 21.9	4 4.26			10.500 10.500	120 0.0001	19.689 0.0 0.001		Vel = 0.49	
450 to 449	18.69 18.69		-2.86 19.04	4 4.26			10.500 10.500	120 0.0002	19.690 0.0 0.002		Vel = 0.43	
449 to 448	18.69 19.52		-2.75 16.29	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0001	19.692 -0.359 0.003		Vel = 0.37	
448 to 447	19.52 19.52		-4.15 12.14	4 4.26			8.000 8.000	120 0	19.336 0.0 0.0		Vel = 0.27	
447 to 446	19.52 19.52		-4.08 8.06	4 4.26			9.000 9.000	120 0	19.336 0.0 0.0		Vel = 0.18	
446 to 445	19.52 19.52		-4.03 4.03	4 4.26			9.000 9.000	120 0.0001	19.336 0.0 0.001		Vel = 0.09	
445 to 484	19.52 18.86		0.0 4.03	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0001	19.337 0.286 0.005		Vel = 0.24	
484 to 483	18.86 18.73		0.0 4.03	2.5 2.635			11.000 11.000	120 0.0001	19.628 0.056 0.001		Vel = 0.24	
483 to 485	18.73 18.63		0.0 4.03	2.5 2.635			8.500 8.500	120 0.0001	19.685 0.043 0.001		Vel = 0.24	
485 to 486	18.63 18.49		0.0 4.03	2.5 2.635			11.420 11.420	120 0	19.729 0.061 0.0		Vel = 0.24	
486 to 444	18.49 17.59		0.0 4.03	2.5 2.635	T	16.474	74.680 16.474 91.154	120 0.0001	19.790 0.390 0.007		Vel = 0.24	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
444 to 443	17.59 17.59		0.0 4.03	6 6.357		9.000 9.000	120 0	20.187 0.0		Vel = 0.04	
443 to 442	17.59 17.59		4.03 8.06	6 6.357		9.000 9.000	120 0	20.187 0.0		Vel = 0.08	
442 to 441	17.59 17.59		4.08 12.14	6 6.357		8.000 8.000	120 0	20.187 0.0		Vel = 0.12	
441 to 440	17.59 17.59		4.15 16.29	6 6.357		8.000 8.000	120 0	20.187 0.0		Vel = 0.16	
440 to 439	17.59 17.59		2.75 19.04	6 6.357		10.500 10.500	120 0.0001	20.187 0.001		Vel = 0.19	
439 to 438	17.59 17.59		2.86 21.9	6 6.357		10.500 10.500	120 0	20.188 0.0		Vel = 0.22	
438 to 437	17.59 17.59		3.02 24.92	6 6.357		9.250 9.250	120 0	20.188 0.0		Vel = 0.25	
437 to 436	17.59 17.59		0.0 24.92	6 6.357		1.250 1.250	120 0	20.188 0.0		Vel = 0.25	
436 to 435	17.59 17.59		3.20 28.12	6 6.357		8.000 8.000	120 0	20.188 0.0		Vel = 0.28	
435 to 403	17.59 17.59		0.0 28.12	6 6.357		2.500 2.500	120 0	20.188 0.0		Vel = 0.28	
403 to 404	17.59 17.59		3.40 31.52	6 6.357		10.500 10.500	120 0.0001	20.188 0.001		Vel = 0.32	
404 to 405	17.59 17.59		3.66 35.18	6 6.357		10.500 10.500	120 0.0001	20.189 0.001		Vel = 0.36	
405 to 406	17.59 17.59		3.95 39.13	6 6.357		10.500 10.500	120 0	20.190 0.0		Vel = 0.40	
406 to 407	17.59 17.59		4.27 43.4	6 6.357		10.500 10.500	120 0.0001	20.190 0.001		Vel = 0.44	
407 to 408	17.59 17.59		4.72 48.12	6 6.357		10.500 10.500	120 0.0001	20.191 0.001		Vel = 0.49	
408 to 409	17.59 17.59		5.06 53.18	6 6.357		10.500 10.500	120 0.0002	20.192 0.002		Vel = 0.54	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
409 to 410	17.59 17.59		5.52 58.7	6 6.357		10.500 10.500	120 0.0001	20.194 0.0 0.001		Vel = 0.59	
410 to 411	17.59 17.59		6.04 64.74	6 6.357		10.500 10.500	120 0.0002	20.195 0.0 0.002		Vel = 0.65	
411 to 412	17.59 17.59		6.61 71.35	6 6.357		10.500 10.500	120 0.0002	20.197 0.0 0.002		Vel = 0.72	
412 to 413	17.59 17.59		7.25 78.6	6 6.357		6.170 6.170	120 0.0003	20.199 0.0 0.002		Vel = 0.79	
413 to 414	17.59 17.59		57.28 135.88	6 6.357		9.000 9.000	120 0.0007	20.201 0.0 0.006		Vel = 1.37	
414 to 415	17.59 17.59		57.35 193.23	6 6.357		10.000 10.000	120 0.0013	20.207 0.0 0.013		Vel = 1.95	
415 to 416	17.59 17.59		8.25 201.48	6 6.357	T 37.72	10.000 37.720 47.720	120 0.0014	20.220 0.0 0.069		Vel = 2.04	
416 to 417	17.59 17.41		10.51 211.99	6 6.357	E 17.603	23.300 17.603 40.903	120 0.0016	20.289 0.078 0.065		Vel = 2.14	
417 to TR4	17.41 17.24		11.26 223.25	6 6.357	6E 105.616	320.930 105.616 426.546	120 0.0017	20.432 0.074 0.744		Vel = 2.26	
TR4 to BR4	17.24 2.83		0.0 223.25	6 6.357	T 37.72 G 3.772	14.410 41.492 55.902	120 0.0018	21.250 6.241 0.098		Vel = 2.26	
BR4 to BR3	2.83 2.83		0.0 223.25	4 4.26		1.250 1.250	120 0.0120	27.589 0.0 0.015		Vel = 5.03	
BR3 to 127	2.83 2.792		0.0 223.25	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0123	27.604 0.016 0.363		Vel = 5.03	
127 to 128	2.792 2		0.0 223.25	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0018	27.983 0.343 0.035		Vel = 2.26	
128 to PO	2 1.080		0.0 223.25	8 8.249	7E 147.988 T 41.108 B 14.094 S 52.853	31.833 256.043 287.876	120 0.0005	28.361 0.398 0.141		Vel = 1.34	
PO			0.0 223.25					28.900	K Factor = 41.53		
System Demand Pressure								28.900			
Safety Margin								94.251			
Continuation Pressure								123.151			

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
Pressure @ Pump Outlet									123.151			
Pressure From Pump Curve									-88.681			
Pressure @ Pump Inlet									34.470			
PI to FLG	1.080 -5		0.0 223.25	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0005	34.470 2.633 0.069		Vel = 1.34	
FLG to TEST	-5 -2		0.0 223.25	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0004	37.172 5.259 0.082		* * Fixed Loss = 6.558 Vel = 1.33	
TEST			250.00 473.25						42.513		Qa = 250.00 K Factor = 72.58	
491 to 493	18.64 18.51		1.39 1.39	2 2.157			11.330 11.330	120 0.0001	17.340 0.056 0.001		Vel = 0.12	
493 to 494	18.51 18.36	13.4	55.90 57.29	2 2.157			12.000 12.000	120 0.0272	17.397 0.065 0.326		K = K @ EQ04 Vel = 5.03	
494 to 413	18.36 17.59		0.0 57.29	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0273	17.788 0.333 2.080		Vel = 5.03	
413			0.0 57.29						20.201		K Factor = 12.75	
429 to 430	18.69 18.69		-24.26 -24.26	4 4.26			9.000 9.000	120 -0.0002	19.598 0.0 -0.002		Vel = 0.55	
430 to 431	18.69 18.69		54.28 30.02	4 4.26			10.000 10.000	120 0.0003	19.596 0.0 0.003		Vel = 0.68	
431 to 432	18.69 18.69		-8.26 21.76	4 4.26			10.000 10.000	120 0.0001	19.599 0.0 0.001		Vel = 0.49	
432 to 433	18.69 18.69		-10.50 11.26	4 4.26			9.000 9.000	120 0.0001	19.600 0.0 0.001		Vel = 0.25	
433 to 434	18.69 19.53		0.0 11.26	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0014	19.601 -0.364 0.018		Vel = 0.99	
434 to 417	19.53 17.41		0.0 11.26	2 2.157	E T	6.153 12.307	174.640 18.460 193.100	120 0.0013	19.255 0.918 0.259		Vel = 0.99	
417			0.0 11.26						20.432		K Factor = 2.49	
430 to 480	18.69 19.53		-54.28 -54.28	2 2.157	T	12.307	0.830 12.307 13.137	120 -0.0247	19.596 -0.364 -0.324		Vel = 4.77	
480 to 495	19.53 18.78		0.0 -54.28	2 2.157	E	6.153	62.000 6.153 68.153	120 -0.0247	18.908 0.325 -1.681		Vel = 4.77	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
495 to 496	18.78 18.64		0.0 -54.28	2 2.157			11.000 11.000	120 -0.0246	17.552 0.061 -0.271		Vel = 4.77	
496 to 497	18.64 18.51	13.38	55.72 1.44	2 2.157			11.330 11.330	120 0.0001	17.342 0.056 0.001		K = K @ EQ03 Vel = 0.13	
497 to 498	18.51 18.36	13.4	55.90 57.34	2 2.157			12.000 12.000	120 0.0272	17.399 0.065 0.327		K = K @ EQ04 Vel = 5.03	
498 to 414	18.36 17.59		0.0 57.34	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0273	17.791 0.333 2.083		Vel = 5.03	
414			0.0 57.34						20.207		K Factor = 12.76	
431 to 481	18.69 19.53		8.25 8.25	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0008	19.599 -0.364 0.010		Vel = 0.72	
481 to 499	19.53 18.36		0.0 8.25	2 2.157	E	6.153	96.330 6.153 102.483	120 0.0008	19.245 0.507 0.077		Vel = 0.72	
499 to 415	18.36 17.59		0.0 8.25	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0008	19.829 0.333 0.058		Vel = 0.72	
415			0.0 8.25						20.220		K Factor = 1.83	
432 to 482	18.69 19.53		10.51 10.51	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0012	19.600 -0.364 0.016		Vel = 0.92	
482 to 416	19.53 17.59		0.0 10.51	2 2.157	E	6.153	160.330 6.153 166.483	120 0.0012	19.252 0.840 0.197		Vel = 0.92	
416			0.0 10.51						20.289		K Factor = 2.33	
428 to 478	18.69 19.53		7.25 7.25	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0006	19.609 -0.364 0.008		Vel = 0.64	
478 to 412	19.53 17.59		0.0 7.25	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0006	19.253 0.840 0.106		Vel = 0.64	
412			0.0 7.25						20.199		K Factor = 1.61	
427 to 477	18.69 19.53		6.61 6.61	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0005	19.624 -0.364 0.007		Vel = 0.58	
477 to 411	19.53 17.59		0.0 6.61	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0005	19.267 0.840 0.090		Vel = 0.58	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
411			0.0 6.61						20.197		K Factor = 1.47	
426 to 476	18.69 19.53		6.04	2	T	12.307	0.830 12.307 13.137	120	19.637 -0.364 0.006		Vel = 0.53	
476 to 410	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	19.279 0.840 0.076		Vel = 0.53	
410			0.0 6.04						20.195		K Factor = 1.34	
425 to 475	18.69 19.53		5.52	2	T	12.307	0.830 12.307 13.137	120	19.648 -0.364 0.005		Vel = 0.48	
475 to 409	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	19.289 0.840 0.065		Vel = 0.48	
409			0.0 5.52						20.194		K Factor = 1.23	
424 to 474	18.69 19.53		5.06	2	T	12.307	0.830 12.307 13.137	120	19.657 -0.364 0.004		Vel = 0.44	
474 to 408	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	19.297 0.840 0.055		Vel = 0.44	
408			0.0 5.06						20.192		K Factor = 1.13	
423 to 473	18.69 19.53		4.73	2	T	12.307	0.830 12.307 13.137	120	19.665 -0.364 0.003		Vel = 0.42	
473 to 472	19.53 17.6		0.0	2	E	6.153	159.500 6.153 165.653	120	19.304 0.836 0.045		Vel = 0.42	
472 to 407	17.6 17.59		0.0	2.5	T	16.474	0.830 16.474 17.304	120	20.185 0.004 0.002		Vel = 0.28	
407			0.0 4.73						20.191		K Factor = 1.05	
422 to 471	18.69 19.53		4.27	2	T	12.307	0.830 12.307 13.137	120	19.671 -0.364 0.003		Vel = 0.37	
471 to 406	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	19.310 0.840 0.040		Vel = 0.37	
406			0.0 4.27						20.190		K Factor = 0.95	
421 to 470	18.69 19.53		3.94	2	T	12.307	0.830 12.307 13.137	120	19.676 -0.364 0.003		Vel = 0.35	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
470 to 405	19.53 17.59		0.0 3.94	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0002	19.315 0.840 0.035		Vel = 0.35	
405			0.0 3.94					20.190		K Factor = 0.88	
420 to 469	18.69 19.53		3.66 3.66	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	19.680 -0.364 0.003		Vel = 0.32	
469 to 404	19.53 17.59		0.0 3.66	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0002	19.319 0.840 0.030		Vel = 0.32	
404			0.0 3.66					20.189		K Factor = 0.81	
419 to 418	18.69 19.53		3.41 3.41	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	19.684 -0.364 0.002		Vel = 0.30	
418 to 402	19.53 17.6		0.0 3.41	2 2.157	E 6.153	159.500 6.153 165.653	120 0.0001	19.322 0.836 0.024		Vel = 0.30	
402 to 403	17.6 17.59		0.0 3.41	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	20.182 0.004 0.002		Vel = 0.30	
403			0.0 3.41					20.188		K Factor = 0.76	
452 to 455	18.69 19.53		3.20 3.2	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	19.686 -0.364 0.002		Vel = 0.28	
455 to 454	19.53 17.6		0.0 3.2	2 2.157	E 6.153	159.500 6.153 165.653	120 0.0001	19.324 0.836 0.022		Vel = 0.28	
454 to 436	17.6 17.59		0.0 3.2	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	20.182 0.004 0.002		Vel = 0.28	
436			0.0 3.20					20.188		K Factor = 0.71	
451 to 460	18.69 19.53		3.02 3.02	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0001	19.689 -0.364 0.001		Vel = 0.27	
460 to 459	19.53 17.6		0.0 3.02	2 2.157	E 6.153	159.500 6.153 165.653	120 0.0001	19.326 0.836 0.020		Vel = 0.27	
459 to 438	17.6 17.59		0.0 3.02	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	20.182 0.004 0.002		Vel = 0.27	
438			0.0 3.02					20.188		K Factor = 0.67	
450 to 467	18.69 19.53		2.87 2.87	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	19.690 -0.364 0.002		Vel = 0.25	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
467 to 439	19.53 17.59		0.0 2.87	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0001	19.328 0.840 0.020		Vel = 0.25	
439			0.0 2.87					20.188		K Factor = 0.64	
449 to 468	18.69 19.53		2.75 2.75	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0001	19.692 -0.364 0.001		Vel = 0.24	
468 to 440	19.53 17.59		0.0 2.75	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0001	19.329 0.840 0.018		Vel = 0.24	
440			0.0 2.75					20.187		K Factor = 0.61	
448 to 441	19.52 17.59		4.15 4.15	2.5 2.635	2T 32.948	160.340 32.948 193.288	120 0.0001	19.336 0.836 0.015		Vel = 0.24	
441			0.0 4.15					20.187		K Factor = 0.92	
447 to 442	19.52 17.59		4.08 4.08	2.5 2.635	2T 32.948	160.340 32.948 193.288	120 0.0001	19.336 0.836 0.015		Vel = 0.24	
442			0.0 4.08					20.187		K Factor = 0.91	
446 to 487	19.52 18.86		4.04 4.04	2.5 2.635	T 16.474	54.740 16.474 71.214	120 0.0001	19.336 0.286 0.006		Vel = 0.24	
487 to 488	18.86 18.73		0.0 4.04	2.5 2.635		11.000 11.000	120 0.0001	19.628 0.056 0.001		Vel = 0.24	
488 to 489	18.73 18.63		0.0 4.04	2.5 2.635		8.500 8.500	120 0.0001	19.685 0.043 0.001		Vel = 0.24	
489 to 490	18.63 18.49		0.0 4.04	2.5 2.635		11.420 11.420	120 0	19.729 0.061 0.0		Vel = 0.24	
490 to 443	18.49 17.59		0.0 4.04	2.5 2.635	T 16.474	74.680 16.474 91.154	120 0.0001	19.790 0.390 0.007		Vel = 0.24	
443			0.0 4.04					20.187		K Factor = 0.90	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GM SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

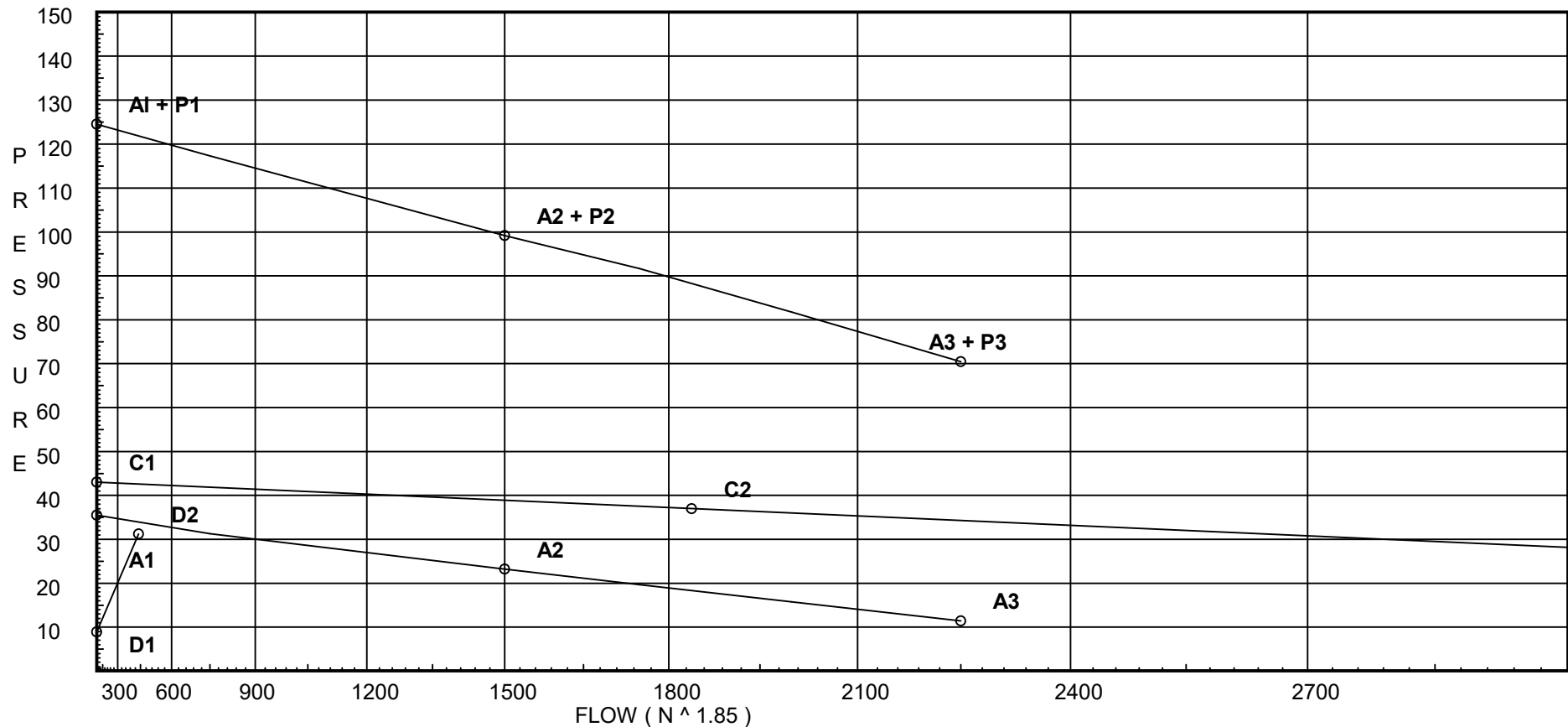
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.939
D2 - System Flow : 439.5
D2 - System Pressure : 31.226
Hose (Demand) :
D3 - System Demand : 439.5
Hose (Adj City) : 250
Safety Margin : 89.819



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			121.045	439.5	31.226
TEST	43.0	37	1839.0	42.023	689.5	42.023

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>	
DP03	14.0	16.8	8.0	47.52	0.01	130
EQ03	18.64		12.21			
DP01	14.0	16.8	8.0	47.52	0.01	130
EQ01	18.36		12.15			
DP02	14.0	16.8	8.0	47.52	0.01	130
EQ02	18.78		12.24			
DP04	14.0	16.8	8.0	47.52	0.01	130
EQ04	18.51		12.18			
491	18.64	13.6	12.21	47.52	K=K @ EQ03	
492	18.78	13.58	12.34	47.7	K=K @ EQ02	
479	19.53		16.49			
429	18.69		17.71			
428	18.69		17.75			
427	18.69		17.81			
426	18.69		17.86			
425	18.69		17.9			
424	18.69		17.93			
423	18.69		17.96			
422	18.69		17.98			
421	18.69		18.0			
420	18.69		18.02			
419	18.69		18.03			
452	18.69		18.04			
451	18.69		18.05			
450	18.69		18.06			
449	18.69		18.06			
448	19.52		17.72			
447	19.52		17.72			
446	19.52		17.72			
445	19.52		17.72			
484	18.86		18.02			
483	18.73		18.08			
485	18.63		18.13			
486	18.49		18.19			
444	17.59		18.61			
443	17.59		18.61			
442	17.59		18.61			
441	17.59		18.61			
440	17.59		18.61			
439	17.59		18.61			
438	17.59		18.61			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
437	17.59		18.61		
436	17.59		18.61		
435	17.59		18.61		
403	17.59		18.61		
404	17.59		18.61		
405	17.59		18.62		
406	17.59		18.62		
407	17.59		18.62		
408	17.59		18.63		
409	17.59		18.63		
410	17.59		18.64		
411	17.59		18.64		
412	17.59		18.65		
413	17.59		18.66		
414	17.59		18.68		
415	17.59		18.72		
416	17.59		18.96		
417	17.41		19.27		
TR4	17.24		21.95		
BR4	2.83		28.53		
BR3	2.83		28.58		
127	2.792		29.87		
128	2.0		30.33		
PO	1.08		31.23		
PI	1.08		33.16		
FLG	-5.0		36.03		
TEST	-2.0		42.02	250.0	
493	18.51	13.61	12.27	47.68	K=K @ EQ04
494	18.36	13.63	12.59	48.38	K=K @ EQ01
430	18.69		17.7		
431	18.69		17.7		
432	18.69		17.71		
433	18.69		17.71		
434	19.53		17.41		
480	19.53		16.48		
495	18.78	13.58	12.34	47.71	K=K @ EQ02
496	18.64	13.6	12.21	47.52	K=K @ EQ03
497	18.51	13.61	12.27	47.69	K=K @ EQ04
498	18.36	13.63	12.6	48.39	K=K @ EQ01
481	19.53		17.29		
499	18.36	13.63	17.43	56.91	K=K @ EQ01
482	19.53		17.4		
478	19.53		17.42		
477	19.53		17.47		
476	19.53		17.52		
475	19.53		17.55		
474	19.53		17.58		
473	19.53		17.61		
472	17.6		18.61		
471	19.53		17.63		
470	19.53		17.65		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
469	19.53		17.66		
418	19.53		17.68		
402	17.6		18.6		
455	19.53		17.68		
454	17.6		18.6		
460	19.53		17.69		
459	17.6		18.6		
467	19.53		17.7		
468	19.53		17.7		
487	18.86		18.02		
488	18.73		18.08		
489	18.63		18.13		
490	18.49		18.19		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
DP03 to EQ03	14 18.64	16.80	47.52 47.52	1 1.049	T 5.0	4.640 5.000 9.640	120 0.6452	8.000 -2.010 6.220		Vel = 17.64	
EQ03			0.0 47.52					12.210		K Factor = 13.60	
DP01 to EQ01	14 18.36	16.80	47.52 47.52	1 1.049	T 5.0	4.360 5.000 9.360	120 0.6451	8.000 -1.888 6.038		Vel = 17.64	
EQ01			0.0 47.52					12.150		K Factor = 13.63	
DP02 to EQ02	14 18.78	16.80	47.52 47.52	1 1.049	T 5.0	4.780 5.000 9.780	120 0.6451	8.000 -2.070 6.309		Vel = 17.64	
EQ02			0.0 47.52					12.239		K Factor = 13.58	
DP04 to EQ04	14 18.51	16.80	47.52 47.52	1 1.049	T 5.0	4.510 5.000 9.510	120 0.6451	8.000 -1.953 6.135		Vel = 17.64	
EQ04			0.0 47.52					12.182		K Factor = 13.61	
491 to 492	18.64 18.78	13.6	44.46 44.46	2 2.157		11.000 11.000	120 0.0170	12.210 -0.061 0.187		K = K @ EQ03 Vel = 3.90	
492 to 479	18.78 19.53	13.58	47.70 92.16	2 2.157	E 6.153	62.000 6.153 68.153	120 0.0657	12.336 -0.325 4.475		K = K @ EQ02 Vel = 8.09	
479 to 429	19.53 18.69		0.0 92.16	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0656	16.486 0.364 0.862		Vel = 8.09	
429 to 428	18.69 18.69		67.49 159.65	4 4.26		6.170 6.170	120 0.0066	17.712 0.0 0.041		Vel = 3.59	
428 to 427	18.69 18.69		-14.72 144.93	4 4.26		10.500 10.500	120 0.0055	17.753 0.0 0.058		Vel = 3.26	
427 to 426	18.69 18.69		-13.43 131.5	4 4.26		10.500 10.500	120 0.0046	17.811 0.0 0.048		Vel = 2.96	
426 to 425	18.69 18.69		-12.26 119.24	4 4.26		10.500 10.500	120 0.0039	17.859 0.0 0.041		Vel = 2.68	
425 to 424	18.69 18.69		-11.22 108.02	4 4.26		10.500 10.500	120 0.0031	17.900 0.0 0.033		Vel = 2.43	
424 to 423	18.69 18.69		-10.26 97.76	4 4.26		10.500 10.500	120 0.0027	17.933 0.0 0.028		Vel = 2.20	
423 to 422	18.69 18.69		-9.61 88.15	4 4.26		10.500 10.500	120 0.0022	17.961 0.0 0.023		Vel = 1.98	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
422 to 421	18.69 18.69		-8.67 79.48	4 4.26			10.500 10.500	120 0.0018	17.984 0.0 0.019		Vel = 1.79	
421 to 420	18.69 18.69		-8.01 71.47	4 4.26			10.500 10.500	120 0.0015	18.003 0.0 0.016		Vel = 1.61	
420 to 419	18.69 18.69		-7.43 64.04	4 4.26			10.500 10.500	120 0.0012	18.019 0.0 0.013		Vel = 1.44	
419 to 452	18.69 18.69		-6.93 57.11	4 4.26			10.500 10.500	120 0.0010	18.032 0.0 0.010		Vel = 1.29	
452 to 451	18.69 18.69		-6.49 50.62	4 4.26			10.500 10.500	120 0.0008	18.042 0.0 0.008		Vel = 1.14	
451 to 450	18.69 18.69		-6.12 44.5	4 4.26			10.500 10.500	120 0.0007	18.050 0.0 0.007		Vel = 1.00	
450 to 449	18.69 18.69		-5.83 38.67	4 4.26			10.500 10.500	120 0.0005	18.057 0.0 0.005		Vel = 0.87	
449 to 448	18.69 19.52		-5.58 33.09	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0003	18.062 -0.359 0.012		Vel = 0.74	
448 to 447	19.52 19.52		-8.43 24.66	4 4.26			8.000 8.000	120 0.0002	17.715 0.0 0.002		Vel = 0.56	
447 to 446	19.52 19.52		-8.28 16.38	4 4.26			9.000 9.000	120 0.0001	17.717 0.0 0.001		Vel = 0.37	
446 to 445	19.52 19.52		-8.20 8.18	4 4.26			9.000 9.000	120 0	17.718 0.0 0.0		Vel = 0.18	
445 to 484	19.52 18.86		0.0 8.18	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0003	17.718 0.286 0.020		Vel = 0.48	
484 to 483	18.86 18.73		0.0 8.18	2.5 2.635			11.000 11.000	120 0.0003	18.024 0.056 0.003		Vel = 0.48	
483 to 485	18.73 18.63		0.0 8.18	2.5 2.635			8.500 8.500	120 0.0004	18.083 0.043 0.003		Vel = 0.48	
485 to 486	18.63 18.49		0.0 8.18	2.5 2.635			11.420 11.420	120 0.0002	18.129 0.061 0.002		Vel = 0.48	
486 to 444	18.49 17.59		0.0 8.18	2.5 2.635	T	16.474	74.680 16.474 91.154	120 0.0003	18.192 0.390 0.026		Vel = 0.48	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
444 to 443	17.59 17.59		0.0 8.18	6 6.357		9.000 9.000	120 0	18.608 0.0		Vel = 0.08	
443 to 442	17.59 17.59		8.20 16.38	6 6.357		9.000 9.000	120 0	18.608 0.0		Vel = 0.17	
442 to 441	17.59 17.59		8.28 24.66	6 6.357		8.000 8.000	120 0	18.608 0.0		Vel = 0.25	
441 to 440	17.59 17.59		8.43 33.09	6 6.357		8.000 8.000	120 0.0001	18.608 0.0		Vel = 0.33	
440 to 439	17.59 17.59		5.58 38.67	6 6.357		10.500 10.500	120 0	18.609 0.0		Vel = 0.39	
439 to 438	17.59 17.59		5.83 44.5	6 6.357		10.500 10.500	120 0.0001	18.609 0.0		Vel = 0.45	
438 to 437	17.59 17.59		6.12 50.62	6 6.357		9.250 9.250	120 0.0001	18.610 0.0		Vel = 0.51	
437 to 436	17.59 17.59		0.0 50.62	6 6.357		1.250 1.250	120 0	18.611 0.0		Vel = 0.51	
436 to 435	17.59 17.59		6.49 57.11	6 6.357		8.000 8.000	120 0.0001	18.611 0.0		Vel = 0.58	
435 to 403	17.59 17.59		0.0 57.11	6 6.357		2.500 2.500	120 0.0004	18.612 0.0		Vel = 0.58	
403 to 404	17.59 17.59		6.93 64.04	6 6.357		10.500 10.500	120 0.0002	18.613 0.0		Vel = 0.65	
404 to 405	17.59 17.59		7.43 71.47	6 6.357		10.500 10.500	120 0.0002	18.615 0.0		Vel = 0.72	
405 to 406	17.59 17.59		8.01 79.48	6 6.357		10.500 10.500	120 0.0003	18.617 0.0		Vel = 0.80	
406 to 407	17.59 17.59		8.67 88.15	6 6.357		10.500 10.500	120 0.0003	18.620 0.0		Vel = 0.89	
407 to 408	17.59 17.59		9.61 97.76	6 6.357		10.500 10.500	120 0.0004	18.623 0.0		Vel = 0.99	
408 to 409	17.59 17.59		10.26 108.02	6 6.357		10.500 10.500	120 0.0005	18.627 0.0		Vel = 1.09	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
409 to 410	17.59 17.59		11.22 119.24	6 6.357		10.500 10.500	120 0.0005	18.632 0.0 0.005		Vel = 1.21	
410 to 411	17.59 17.59		12.26 131.5	6 6.357		10.500 10.500	120 0.0007	18.637 0.0 0.007		Vel = 1.33	
411 to 412	17.59 17.59		13.43 144.93	6 6.357		10.500 10.500	120 0.0009	18.644 0.0 0.009		Vel = 1.47	
412 to 413	17.59 17.59		14.72 159.65	6 6.357		6.170 6.170	120 0.0008	18.653 0.0 0.005		Vel = 1.61	
413 to 414	17.59 17.59		99.12 258.77	6 6.357		9.000 9.000	120 0.0023	18.658 0.0 0.021		Vel = 2.62	
414 to 415	17.59 17.59		99.28 358.05	6 6.357		10.000 10.000	120 0.0042	18.679 0.0 0.042		Vel = 3.62	
415 to 416	17.59 17.59		37.71 395.76	6 6.357	T 37.72	10.000 37.720 47.720	120 0.0050	18.721 0.0 0.240		Vel = 4.00	
416 to 417	17.59 17.41		21.18 416.94	6 6.357	E 17.603	23.300 17.603 40.903	120 0.0055	18.961 0.078 0.227		Vel = 4.21	
417 to TR4	17.41 17.24		22.56 439.5	6 6.357	6E 105.616	320.930 105.616 426.546	120 0.0061	19.266 0.074 2.607		Vel = 4.44	
TR4 to BR4	17.24 2.83		0.0 439.5	6 6.357	T 37.72 G 3.772	14.410 41.492 55.902	120 0.0061	21.947 6.241 0.342		Vel = 4.44	
BR4 to BR3	2.83 2.83		0.0 439.5	4 4.26		1.250 1.250	120 0.0432	28.530 0.0 0.054		Vel = 9.89	
BR3 to 127	2.83 2.792		0.0 439.5	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0429	28.584 0.016 1.267		Vel = 9.89	
127 to 128	2.792 2		0.0 439.5	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0061	29.867 0.343 0.122		Vel = 4.44	
128 to PO	2 1.080		0.0 439.5	8 8.249	7E 147.988 T 41.108 B 14.094 S 52.853	31.833 256.043 287.876	120 0.0017	30.332 0.398 0.496		Vel = 2.64	
PO			0.0 439.50					31.226	K Factor = 78.65		
System Demand Pressure								31.226			
Safety Margin								89.819			
Continuation Pressure								121.045			

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
Pressure @ Pump Outlet									121.045			
Pressure From Pump Curve									-87.884			
Pressure @ Pump Inlet									33.161			
PI to FLG	1.080 -5		0.0 439.5	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0017	33.161 2.633 0.239		Vel = 2.64	
FLG to TEST	-5 -2		0.0 439.5	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0013	36.033 5.701 0.289		* * Fixed Loss = 7 Vel = 2.63	
TEST			250.00 689.50						42.023		Qa = 250.00 K Factor = 106.36	
491 to 493	18.64 18.51		3.06 3.06	2 2.157			11.330 11.330	120 0.0001	12.210 0.056 0.001		Vel = 0.27	
493 to 494	18.51 18.36	13.61	47.68 50.74	2 2.157			12.000 12.000	120 0.0218	12.267 0.065 0.261		K = K @ EQ04 Vel = 4.45	
494 to 413	18.36 17.59	13.63	48.38 99.12	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0751	12.593 0.333 5.732		K = K @ EQ01 Vel = 8.70	
413			0.0 99.12						18.658		K Factor = 22.95	
429 to 430	18.69 18.69		-67.49 -67.49	4 4.26			9.000 9.000	120 -0.0013	17.712 0.0 -0.012		Vel = 1.52	
430 to 431	18.69 18.69		92.03 24.54	4 4.26			10.000 10.000	120 0.0002	17.700 0.0 0.002		Vel = 0.55	
431 to 432	18.69 18.69		19.20 43.74	4 4.26			10.000 10.000	120 0.0006	17.702 0.0 0.006		Vel = 0.98	
432 to 433	18.69 18.69		-21.18 22.56	4 4.26			9.000 9.000	120 0.0002	17.708 0.0 0.002		Vel = 0.51	
433 to 434	18.69 19.53		0.0 22.56	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0049	17.710 -0.364 0.064		Vel = 1.98	
434 to 417	19.53 17.41		0.0 22.56	2 2.157	E T	6.153 12.307	174.640 18.460 193.100	120 0.0049	17.410 0.918 0.938		Vel = 1.98	
417			0.0 22.56						19.266		K Factor = 5.14	
430 to 480	18.69 19.53		-92.03 -92.03	2 2.157	T	12.307	0.830 12.307 13.137	120 -0.0655	17.700 -0.364 -0.860		Vel = 8.08	
480 to 495	19.53 18.78		0.0 -92.03	2 2.157	E	6.153	62.000 6.153 68.153	120 -0.0655	16.476 0.325 -4.463		Vel = 8.08	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
495 to 496	18.78 18.64	13.58	47.71 -44.32	2 2.157			11.000 11.000	120 -0.0170	12.338 0.061 -0.187		K = K @ EQ02	
496 to 497	18.64 18.51	13.6	47.52 3.2	2 2.157			11.330 11.330	120 0.0002	12.212 0.056 0.002		K = K @ EQ03	
497 to 498	18.51 18.36	13.61	47.69 50.89	2 2.157			12.000 12.000	120 0.0219	12.270 0.065 0.263		K = K @ EQ04	
498 to 414	18.36 17.59	13.63	48.38 99.27	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0753	12.598 0.333 5.748		K = K @ EQ01	
414			0.0 99.27						18.679		K Factor = 22.97	
431 to 481	18.69 19.53		-19.20 -19.2	2 2.157	T	12.307	0.830 12.307 13.137	120 -0.0036	17.702 -0.364 -0.047		Vel = 1.69	
481 to 499	19.53 18.36		0.0 -19.2	2 2.157	E	6.153	96.330 6.153 102.483	120 -0.0036	17.291 0.507 -0.370		Vel = 1.69	
499 to 415	18.36 17.59	13.63	56.91 37.71	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0126	17.428 0.333 0.960		K = K @ EQ01	
415			0.0 37.71						18.721		K Factor = 8.72	
432 to 482	18.69 19.53		21.18 21.18	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0043	17.708 -0.364 0.057		Vel = 1.86	
482 to 416	19.53 17.59		0.0 21.18	2 2.157	E	6.153	160.330 6.153 166.483	120 0.0043	17.401 0.840 0.720		Vel = 1.86	
416			0.0 21.18						18.961		K Factor = 4.86	
428 to 478	18.69 19.53		14.72 14.72	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0022	17.753 -0.364 0.029		Vel = 1.29	
478 to 412	19.53 17.59		0.0 14.72	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0022	17.418 0.840 0.395		Vel = 1.29	
412			0.0 14.72						18.653		K Factor = 3.41	
427 to 477	18.69 19.53		13.43 13.43	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0018	17.811 -0.364 0.024		Vel = 1.18	
477 to 411	19.53 17.59		0.0 13.43	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0019	17.471 0.840 0.333		Vel = 1.18	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
411			0.0 13.43						18.644		K Factor = 3.11	
426 to 476	18.69 19.53		12.26 12.26	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0016	17.859 -0.364 0.021		Vel = 1.08	
476 to 410	19.53 17.59		0.0 12.26	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0016	17.516 0.840 0.281		Vel = 1.08	
410			0.0 12.26						18.637		K Factor = 2.84	
425 to 475	18.69 19.53		11.21 11.21	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0013	17.900 -0.364 0.017		Vel = 0.98	
475 to 409	19.53 17.59		0.0 11.21	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0013	17.553 0.840 0.239		Vel = 0.98	
409			0.0 11.21						18.632		K Factor = 2.60	
424 to 474	18.69 19.53		10.27 10.27	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0011	17.933 -0.364 0.015		Vel = 0.90	
474 to 408	19.53 17.59		0.0 10.27	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0011	17.584 0.840 0.203		Vel = 0.90	
408			0.0 10.27						18.627		K Factor = 2.38	
423 to 473	18.69 19.53		9.60 9.6	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0010	17.961 -0.364 0.013		Vel = 0.84	
473 to 472	19.53 17.6		0.0 9.6	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0010	17.610 0.836 0.166		Vel = 0.84	
472 to 407	17.6 17.59		0.0 9.6	2.5 2.635	T	16.474	0.830 16.474 17.304	120 0.0004	18.612 0.004 0.007		Vel = 0.56	
407			0.0 9.60						18.623		K Factor = 2.22	
422 to 471	18.69 19.53		8.67 8.67	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0008	17.984 -0.364 0.011		Vel = 0.76	
471 to 406	19.53 17.59		0.0 8.67	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0008	17.631 0.840 0.149		Vel = 0.76	
406			0.0 8.67						18.620		K Factor = 2.01	
421 to 470	18.69 19.53		8.01 8.01	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0008	18.003 -0.364 0.010		Vel = 0.70	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
470 to 405	19.53 17.59		0.0 8.01	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0007	17.649 0.840 0.128		Vel = 0.70	
405			0.0 8.01					18.617		K Factor = 1.86	
420 to 469	18.69 19.53		7.43 7.43	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0006	18.019 -0.364 0.008		Vel = 0.65	
469 to 404	19.53 17.59		0.0 7.43	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0006	17.663 0.840 0.112		Vel = 0.65	
404			0.0 7.43					18.615		K Factor = 1.72	
419 to 418	18.69 19.53		6.92 6.92	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	18.032 -0.364 0.007		Vel = 0.61	
418 to 402	19.53 17.6		0.0 6.92	2 2.157	E T 6.153 12.307	159.500 6.153 165.653	120 0.0005	17.675 0.836 0.090		Vel = 0.61	
402 to 403	17.6 17.59		0.0 6.92	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0006	18.601 0.004 0.008		Vel = 0.61	
403			0.0 6.92					18.613		K Factor = 1.60	
452 to 455	18.69 19.53		6.49 6.49	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	18.042 -0.364 0.006		Vel = 0.57	
455 to 454	19.53 17.6		0.0 6.49	2 2.157	E T 6.153 12.307	159.500 6.153 165.653	120 0.0005	17.684 0.836 0.081		Vel = 0.57	
454 to 436	17.6 17.59		0.0 6.49	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	18.601 0.004 0.006		Vel = 0.57	
436			0.0 6.49					18.611		K Factor = 1.50	
451 to 460	18.69 19.53		6.12 6.12	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	18.050 -0.364 0.006		Vel = 0.54	
460 to 459	19.53 17.6		0.0 6.12	2 2.157	E T 6.153 12.307	159.500 6.153 165.653	120 0.0004	17.692 0.836 0.072		Vel = 0.54	
459 to 438	17.6 17.59		0.0 6.12	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	18.600 0.004 0.006		Vel = 0.54	
438			0.0 6.12					18.610		K Factor = 1.42	
450 to 467	18.69 19.53		5.82 5.82	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0004	18.057 -0.364 0.005		Vel = 0.51	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
467 to 439	19.53 17.59		0.0 5.82	2 2.157	E T 12.307	160.330 18.460 178.790	120 0.0004	17.698 0.840 0.071		Vel = 0.51	
439			0.0 5.82					18.609		K Factor = 1.35	
449 to 468	18.69 19.53		5.58 5.58	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0004	18.062 -0.364 0.005		Vel = 0.49	
468 to 440	19.53 17.59		0.0 5.58	2 2.157	E T 12.307	160.330 18.460 178.790	120 0.0004	17.703 0.840 0.066		Vel = 0.49	
440			0.0 5.58					18.609		K Factor = 1.29	
448 to 441	19.52 17.59		8.43 8.43	2.5 2.635	2T 32.948	160.340 32.948 193.288	120 0.0003	17.715 0.836 0.057		Vel = 0.50	
441			0.0 8.43					18.608		K Factor = 1.95	
447 to 442	19.52 17.59		8.28 8.28	2.5 2.635	2T 32.948	160.340 32.948 193.288	120 0.0003	17.717 0.836 0.055		Vel = 0.49	
442			0.0 8.28					18.608		K Factor = 1.92	
446 to 487	19.52 18.86		8.20 8.2	2.5 2.635	T 16.474	54.740 16.474 71.214	120 0.0003	17.718 0.286 0.019		Vel = 0.48	
487 to 488	18.86 18.73		0.0 8.2	2.5 2.635		11.000 11.000	120 0.0004	18.023 0.056 0.004		Vel = 0.48	
488 to 489	18.73 18.63		0.0 8.2	2.5 2.635		8.500 8.500	120 0.0002	18.083 0.043 0.002		Vel = 0.48	
489 to 490	18.63 18.49		0.0 8.2	2.5 2.635		11.420 11.420	120 0.0003	18.128 0.061 0.003		Vel = 0.48	
490 to 443	18.49 17.59		0.0 8.2	2.5 2.635	T 16.474	74.680 16.474 91.154	120 0.0003	18.192 0.390 0.026		Vel = 0.48	
443			0.0 8.20					18.608		K Factor = 1.90	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
492	479	62.000	494	413	64.000
498	414	64.000	480	495	62.000
499	415	64.000	481	499	96.330

Flow		Safety	Pressure
Required		Margin	Differential
Left	11.000	690.039	89.840
Area Calculated		689.500	89.819
Right	11.000	689.862	89.836
			-0.017

Typical Distance Between Heads = 11.000
Split Point Used in Worst Area Peaked = 491



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GR REC 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

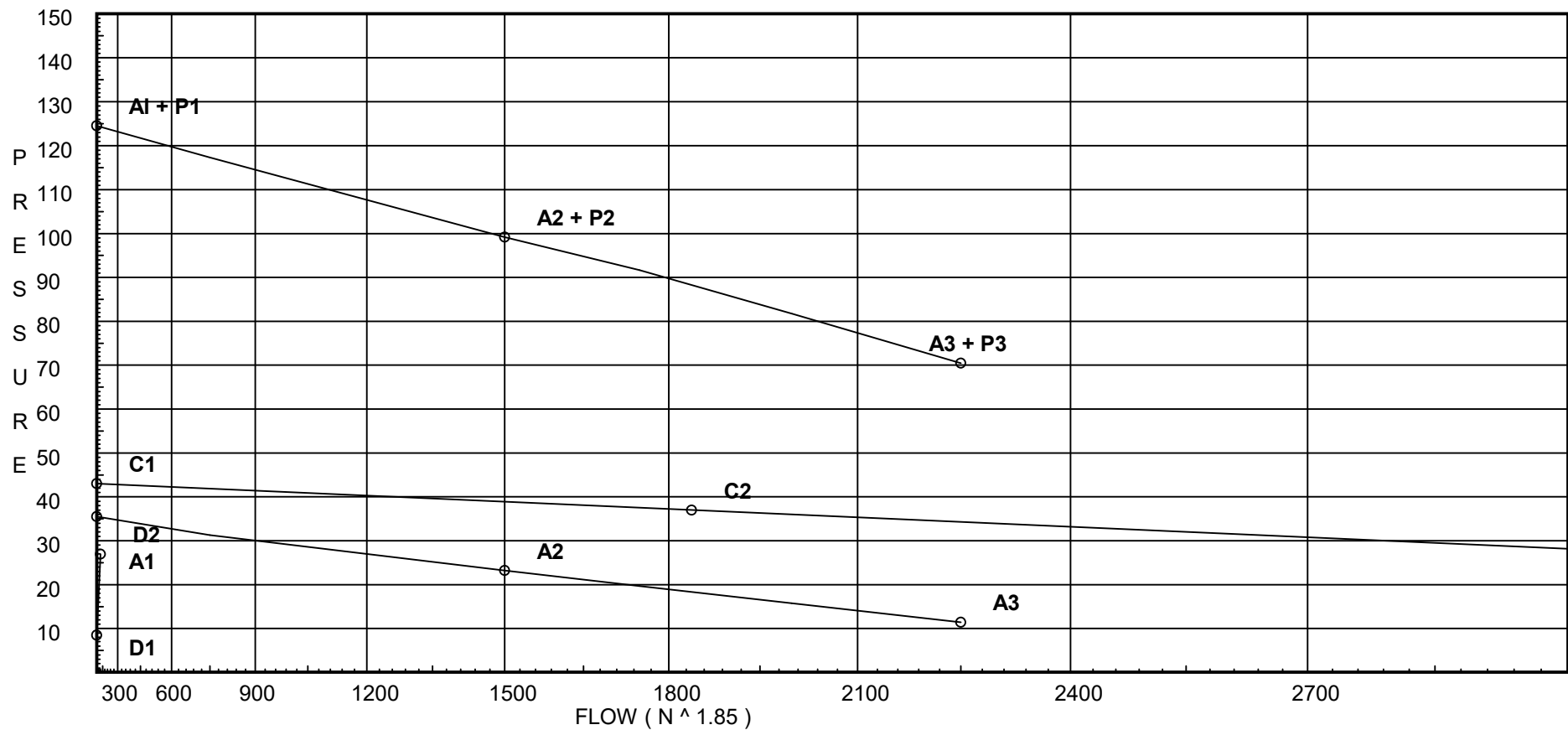
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.489
D2 - System Flow : 118.69
D2 - System Pressure : 26.962
Hose (Demand) :
D3 - System Demand : 118.69
Hose (Adj City) : 250
Safety Margin : 96.955



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.917	118.69	26.962
TEST	43.0	37	1839.0	42.693	368.69	42.693

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
401	17.6	16.8	12.0	58.2	0.01	100
402	17.6		19.04			
403	17.59		19.29			
404	17.59		19.29			
405	17.59		19.3			
406	17.59		19.3			
407	17.59		19.3			
408	17.59		19.31			
409	17.59		19.31			
410	17.59		19.32			
411	17.59		19.32			
412	17.59		19.32			
413	17.59		19.33			
414	17.59		19.33			
415	17.59		19.34			
416	17.59		19.36			
417	17.41		19.45			
TR4	17.24		19.76			
BR4	2.83		26.03			
BR3	2.83		26.04			
127	2.792		26.16			
128	2.0		26.52			
PO	1.08		26.96			
PI	1.08		35.02			
FLG	-5.0		37.67			
TEST	-2.0		42.69		250.0	
418	19.53		18.43			
419	18.69		18.82			
420	18.69		18.82			
421	18.69		18.82			
422	18.69		18.82			
423	18.69		18.83			
424	18.69		18.83			
425	18.69		18.83			
426	18.69		18.83			
427	18.69		18.83			
428	18.69		18.84			
429	18.69		18.84			
430	18.69		18.84			
431	18.69		18.84			
432	18.69		18.84			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
433	18.69		18.84			
434	19.53		18.48			
435	17.59		19.29			
436	17.59		19.29			
437	17.59		19.29			
438	17.59		19.29			
439	17.59		19.29			
440	17.59		19.29			
441	17.59		19.29			
442	17.59		19.29			
443	17.59		19.29			
444	17.59		19.29			
445	19.52		18.45			
446	19.52		18.45			
447	19.52		18.45			
448	19.52		18.45			
449	18.69		18.81			
450	18.69		18.81			
451	18.69		18.81			
452	18.69		18.81			
453	17.6	16.8	12.97	60.49	0.01	100
454	17.6		19.02			
455	19.53		18.43			
456	17.27		19.43			
457	17.38		19.38			
458	17.49		19.33			
459	17.6		19.29			
460	19.53		18.45			
461	17.27		19.43			
462	17.38		19.38			
463	17.49		19.33			
464	17.27		19.43			
465	17.38		19.38			
466	17.49		19.33			
467	19.53		18.45			
468	19.53		18.45			
469	19.53		18.45			
470	19.53		18.46			
471	19.53		18.46			
472	17.6		19.3			
473	19.53		18.46			
474	19.53		18.46			
475	19.53		18.47			
476	19.53		18.47			
477	19.53		18.47			
478	19.53		18.47			
479	19.53		18.47			
480	19.53		18.47			
481	19.53		18.48			
482	19.53		18.48			

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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	*****
401 to 402	17.6 17.6	16.80	58.20 58.2	1 1.049	T	5.0	2.500 5.000 7.500	120 0.9387	12.000 0.0 7.040		Vel = 21.61	
402 to 403	17.6 17.59		-11.43 46.77	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0188	19.040 0.004 0.247		Vel = 4.11	
403 to 404	17.59 17.59		44.44 91.21	6 6.357			10.500 10.500	120 0.0003	19.291 0.0 0.003		Vel = 0.92	
404 to 405	17.59 17.59		-0.20 91.01	6 6.357			10.500 10.500	120 0.0004	19.294 0.0 0.004		Vel = 0.92	
405 to 406	17.59 17.59		0.43 91.44	6 6.357			10.500 10.500	120 0.0003	19.298 0.0 0.003		Vel = 0.92	
406 to 407	17.59 17.59		0.70 92.14	6 6.357			10.500 10.500	120 0.0004	19.301 0.0 0.004		Vel = 0.93	
407 to 408	17.59 17.59		0.95 93.09	6 6.357			10.500 10.500	120 0.0003	19.305 0.0 0.003		Vel = 0.94	
408 to 409	17.59 17.59		1.16 94.25	6 6.357			10.500 10.500	120 0.0004	19.308 0.0 0.004		Vel = 0.95	
409 to 410	17.59 17.59		1.40 95.65	6 6.357			10.500 10.500	120 0.0004	19.312 0.0 0.004		Vel = 0.97	
410 to 411	17.59 17.59		1.64 97.29	6 6.357			10.500 10.500	120 0.0004	19.316 0.0 0.004		Vel = 0.98	
411 to 412	17.59 17.59		1.90 99.19	6 6.357			10.500 10.500	120 0.0004	19.320 0.0 0.004		Vel = 1.00	
412 to 413	17.59 17.59		2.17 101.36	6 6.357			6.170 6.170	120 0.0003	19.324 0.0 0.002		Vel = 1.02	
413 to 414	17.59 17.59		2.34 103.7	6 6.357			9.000 9.000	120 0.0004	19.326 0.0 0.004		Vel = 1.05	
414 to 415	17.59 17.59		2.60 106.3	6 6.357			10.000 10.000	120 0.0005	19.330 0.0 0.005		Vel = 1.07	
415 to 416	17.59 17.59		2.90 109.2	6 6.357	T	37.72	10.000 37.720 47.720	120 0.0005	19.335 0.0 0.022		Vel = 1.10	
416 to 417	17.59 17.41		4.42 113.62	6 6.357	E	17.603	23.300 17.603 40.903	120 0.0005	19.357 0.078 0.020		Vel = 1.15	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
417 to TR4	17.41 17.24		5.07 118.69	6 6.357	6E	105.616	320.930 105.616 426.546	120 0.0005	19.455 0.074 0.231		Vel = 1.20	
TR4 to BR4	17.24 2.83		0.0 118.69	6 6.357	T G	37.72 3.772	14.410 41.492 55.902	120 0.0006	19.760 6.241 0.031		Vel = 1.20	
BR4 to BR3	2.83 2.83		0.0 118.69	4 4.26			1.250 1.250	120 0.0032	26.032 0.0		Vel = 2.67	
BR3 to 127	2.83 2.792		0.0 118.69	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0038	26.036 0.016 0.113		Vel = 2.67	
127 to 128	2.792 2		0.0 118.69	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0006	26.165 0.343 0.011		Vel = 1.20	
128 to PO	2 1.080		0.0 118.69	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0002	26.519 0.398 0.045		Vel = 0.71	
PO			0.0 118.69						26.962		K Factor = 22.86	
System Demand Pressure									26.962			
Safety Margin									96.955			
Continuation Pressure									123.917			
Pressure @ Pump Outlet									123.917			
Pressure From Pump Curve									-88.901			
Pressure @ Pump Inlet									35.016			
PI to FLG	1.080 -5		0.0 118.69	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0002	35.016 2.633 0.021		Vel = 0.71	
FLG to TEST	-5 -2		0.0 118.69	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0001	37.670 4.997 0.026		** Fixed Loss = 6.297 Vel = 0.71	
TEST			250.00 368.69						42.693		Qa = 250.00 K Factor = 56.43	
402 to 418	17.6 19.53		11.43 11.43	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0014	19.040 -0.836 0.229		Vel = 1.00	
418 to 419	19.53 18.69		0.0 11.43	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0014	18.433 0.364 0.018		Vel = 1.00	
419 to 420	18.69 18.69		16.05 27.48	4 4.26			10.500 10.500	120 0.0003	18.815 0.0		Vel = 0.62	
420 to 421	18.69 18.69		0.20 27.68	4 4.26			10.500 10.500	120 0.0003	18.818 0.0		Vel = 0.62	
421 to 422	18.69 18.69		-0.43 27.25	4 4.26			10.500 10.500	120 0.0002	18.821 0.0		Vel = 0.61	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
422 to 423	18.69 18.69		-0.70 26.55	4 4.26			10.500 10.500	120 0.0003	18.823 0.0 0.003		Vel = 0.60	
423 to 424	18.69 18.69		-0.95 25.6	4 4.26			10.500 10.500	120 0.0002	18.826 0.0 0.002		Vel = 0.58	
424 to 425	18.69 18.69		-1.16 24.44	4 4.26			10.500 10.500	120 0.0002	18.828 0.0 0.002		Vel = 0.55	
425 to 426	18.69 18.69		-1.40 23.04	4 4.26			10.500 10.500	120 0.0002	18.830 0.0 0.002		Vel = 0.52	
426 to 427	18.69 18.69		-1.64 21.4	4 4.26			10.500 10.500	120 0.0002	18.832 0.0 0.002		Vel = 0.48	
427 to 428	18.69 18.69		-1.90 19.5	4 4.26			10.500 10.500	120 0.0001	18.834 0.0 0.001		Vel = 0.44	
428 to 429	18.69 18.69		-2.17 17.33	4 4.26			6.170 6.170	120 0.0002	18.835 0.0 0.001		Vel = 0.39	
429 to 430	18.69 18.69		-2.34 14.99	4 4.26			9.000 9.000	120 0.0001	18.836 0.0 0.001		Vel = 0.34	
430 to 431	18.69 18.69		-2.60 12.39	4 4.26			10.000 10.000	120 0	18.837 0.0 0.0		Vel = 0.28	
431 to 432	18.69 18.69		-2.90 9.49	4 4.26			10.000 10.000	120 0.0001	18.837 0.0 0.001		Vel = 0.21	
432 to 433	18.69 18.69		-4.42 5.07	4 4.26			9.000 9.000	120 0	18.838 0.0 0.0		Vel = 0.11	
433 to 434	18.69 19.53		0.0 5.07	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0003	18.838 -0.364 0.004		Vel = 0.45	
434 to 417	19.53 17.41		0.0 5.07	2 2.157	E T	6.153 12.307	174.640 18.460 193.100	120 0.0003	18.478 0.918 0.059		Vel = 0.45	
417			0.0 5.07						19.455		K Factor = 1.15	
403 to 435	17.59 17.59		-44.44 -44.44	6 6.357			2.500 2.500	120 -0.0004	19.291 0.0 -0.001		Vel = 0.45	
435 to 436	17.59 17.59		0.0 -44.44	6 6.357			8.000 8.000	120 0	19.290 0.0 0.0		Vel = 0.45	
436 to 437	17.59 17.59		48.61 4.17	6 6.357			1.250 1.250	120 0	19.290 0.0 0.0		Vel = 0.04	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
437 to 438	17.59 17.59		0.0 4.17	6 6.357			9.250 9.250	120 0	19.290 0.0			
438 to 439	17.59 17.59		-0.50 3.67	6 6.357			10.500 10.500	120 0	19.290 0.0		Vel = 0.04	
439 to 440	17.59 17.59		-0.48 3.19	6 6.357			10.500 10.500	120 0	19.290 0.0		Vel = 0.03	
440 to 441	17.59 17.59		-0.46 2.73	6 6.357			8.000 8.000	120 0	19.290 0.0		Vel = 0.03	
441 to 442	17.59 17.59		-0.70 2.03	6 6.357			8.000 8.000	120 0	19.290 0.0		Vel = 0.02	
442 to 443	17.59 17.59		-0.68 1.35	6 6.357			9.000 9.000	120 0	19.290 0.0		Vel = 0.01	
443 to 444	17.59 17.59		-0.68 0.67	6 6.357			9.000 9.000	120 0	19.290 0.0		Vel = 0.01	
444 to 445	17.59 19.52		0.0 0.67	2.5 2.635	2T	32.948	160.340 32.948 193.288	120 0	19.290 -0.836 0.0		Vel = 0.04	
445 to 446	19.52 19.52		0.0 0.67	4 4.26			9.000 9.000	120 0	18.454 0.0		Vel = 0.02	
446 to 447	19.52 19.52		0.68 1.35	4 4.26			9.000 9.000	120 0	18.454 0.0		Vel = 0.03	
447 to 448	19.52 19.52		0.68 2.03	4 4.26			8.000 8.000	120 0	18.454 0.0		Vel = 0.05	
448 to 449	19.52 18.69		0.70 2.73	4 4.26	2E	26.334	8.830 26.334 35.164	120 0	18.454 0.359 0.001		Vel = 0.06	
449 to 450	18.69 18.69		0.46 3.19	4 4.26			10.500 10.500	120 0	18.814 0.0		Vel = 0.07	
450 to 451	18.69 18.69		0.48 3.67	4 4.26			10.500 10.500	120 0	18.814 0.0		Vel = 0.08	
451 to 452	18.69 18.69		0.50 4.17	4 4.26			10.500 10.500	120 0	18.814 0.0		Vel = 0.09	
452 to 419	18.69 18.69		11.88 16.05	4 4.26			10.500 10.500	120 0.0001	18.814 0.0 0.001		Vel = 0.36	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
419			0.0 16.05						18.815		K Factor = 3.70	
453 to 454	17.6 17.6	16.80	60.49 60.49	1 1.097	T	6.217	1.250 6.217 7.467	120 0.8109	12.966 0.0 6.055			Vel = 20.53
454 to 436	17.6 17.59		-11.87 48.62	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0202	19.021 0.004 0.265			Vel = 4.27
436			0.0 48.62						19.290		K Factor = 11.07	
454 to 455	17.6 19.53		11.88 11.88	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0015	19.021 -0.836 0.246			Vel = 1.04
455 to 452	19.53 18.69		0.0 11.88	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0014	18.431 0.364 0.019			Vel = 1.04
452			0.0 11.88						18.814		K Factor = 2.74	
456 to 457	17.27 17.38	.0	0.0 0.0	2.5 2.635			9.000 9.000	120 0	19.428 -0.048 0.0			Vel = 0
457 to 458	17.38 17.49	.0	0.0 0.0	2.5 2.635			9.000 9.000	120 0	19.381 -0.048 0.0			Vel = 0
458 to 438	17.49 17.59	.0	0.0 0.0	2.5 2.635	T	16.474	8.170 16.474 24.644	120 0	19.333 -0.043 0.0			Vel = 0
438 to 459	17.59 17.6		0.50 0.5	2 2.157	T	12.307	0.830 12.307 13.137	120 0	19.290 -0.004 0.0			Vel = 0.04
459 to 460	17.6 19.53		0.0 0.5	2 2.157	E	6.153	159.500 6.153 165.653	120 0	19.286 -0.836 0.0			Vel = 0.04
460 to 451	19.53 18.69		0.0 0.5	2 2.157	T	12.307	0.830 12.307 13.137	120 0	18.450 0.364 0.0			Vel = 0.04
451			0.0 0.50						18.814		K Factor = 0.12	
461 to 462	17.27 17.38	.0	0.0 0.0	2.5 2.635			9.000 9.000	120 0	19.428 -0.048 0.0			Vel = 0
462 to 463	17.38 17.49	.0	0.0 0.0	2.5 2.635			9.000 9.000	120 0	19.381 -0.048 0.0			Vel = 0
463 to 437	17.49 17.59	.0	0.0 0.0	2.5 2.635	T	16.474	8.170 16.474 24.644	120 0	19.333 -0.043 0.0			Vel = 0

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
437			0.0 0.0						19.290		K Factor = 0	
464 to 465	17.27 17.38	.0	0.0	2.5			9.000	120	19.429 -0.048			
465 to 466	17.38 17.49	.0	0.0	2.5			9.000	120	19.381 -0.048		Vel = 0	
466 to 467	17.49 17.53	.0	0.0	2.5	T	16.474	8.170 16.474	120	19.334 -0.043			
435	17.59		0.0	2.635			24.644	0	0.0		Vel = 0	
435			0.0 0.0						19.291		K Factor = 0	
439 to 467	17.59 19.53		0.48	2	T E	12.307 6.153	160.330 18.460	120	19.290 -0.840			
467 to 450	19.53 18.69		0.48	2.157			178.790	0	0.0		Vel = 0.04	
467 to 450	19.53 18.69		0.0	2	T	12.307	0.830 12.307	120	18.450 0.364			
450			0.48	2.157			13.137	0	0.0		Vel = 0.04	
450			0.0 0.48						18.814		K Factor = 0.11	
440 to 468	17.59 19.53		0.46	2	T E	12.307 6.153	160.330 18.460	120	19.290 -0.840			
468 to 449	19.53 18.69		0.46	2.157			178.790	0	0.0		Vel = 0.04	
468 to 449	19.53 18.69		0.0	2	T	12.307	0.830 12.307	120	18.450 0.364			
449			0.46	2.157			13.137	0	0.0		Vel = 0.04	
449			0.0 0.46						18.814		K Factor = 0.11	
441 to 448	17.59 19.52		0.70	2.5	2T	32.948	160.340 32.948	120	19.290 -0.836			
448			0.7	2.635			193.288	0	0.0		Vel = 0.04	
448			0.0 0.70						18.454		K Factor = 0.16	
442 to 447	17.59 19.52		0.68	2.5	2T	32.948	160.340 32.948	120	19.290 -0.836			
447			0.68	2.635			193.288	0	0.0		Vel = 0.04	
447			0.0 0.68						18.454		K Factor = 0.16	
443 to 446	17.59 19.52		0.68	2.5	2T	32.948	160.340 32.948	120	19.290 -0.836			
446			0.68	2.635			193.288	0	0.0		Vel = 0.04	
446			0.0 0.68						18.454		K Factor = 0.16	
404 to 469	17.59 19.53		0.20	2	T E	12.307 6.153	160.330 18.460	120	19.294 -0.840			
469			0.2	2.157			178.790	0	0.0		Vel = 0.02	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
469 to 420	19.53 18.69		0.0 0.2	2 2.157	T 12.307	0.830 12.307 13.137	120 0	18.454 0.364 0.0			Vel = 0.02
420			0.0 0.20					18.818		K Factor =	0.05
405 to 470	17.59 19.53		-0.43 -0.43	2 2.157	T E 12.307 6.153	160.330 18.460 178.790	120 0	19.298 -0.840 -0.001			Vel = 0.04
470 to 421	19.53 18.69		0.0 -0.43	2 2.157	T 12.307	0.830 12.307 13.137	120 0	18.457 0.364 0.0			Vel = 0.04
421			0.0 -0.43					18.821		K Factor =	-0.10
406 to 471	17.59 19.53		-0.70 -0.7	2 2.157	T E 12.307 6.153	160.330 18.460 178.790	120 0	19.301 -0.840 -0.001			Vel = 0.06
471 to 422	19.53 18.69		0.0 -0.7	2 2.157	T 12.307	0.830 12.307 13.137	120 -0.0001	18.460 0.364 -0.001			Vel = 0.06
422			0.0 -0.70					18.823		K Factor =	-0.16
407 to 472	17.59 17.6		-0.95 -0.95	2.5 2.635	T 16.474	0.830 16.474 17.304	120 -0.0001	19.305 -0.004 -0.001			Vel = 0.06
472 to 473	17.6 19.53		0.0 -0.95	2 2.157	E 6.153	159.500 6.153 165.653	120 0	19.300 -0.836 -0.002			Vel = 0.08
473 to 423	19.53 18.69		0.0 -0.95	2 2.157	T 12.307	0.830 12.307 13.137	120 0	18.462 0.364 0.0			Vel = 0.08
423			0.0 -0.95					18.826		K Factor =	-0.22
424 to 474	18.69 19.53		1.16 1.16	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0001	18.828 -0.364 0.001			Vel = 0.10
474 to 408	19.53 17.59		0.0 1.16	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0	18.465 0.840 0.003			Vel = 0.10
408			0.0 1.16					19.308		K Factor =	0.26
425 to 475	18.69 19.53		1.40 1.4	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0001	18.830 -0.364 0.001			Vel = 0.12
475 to 409	19.53 17.59		0.0 1.4	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0	18.467 0.840 0.005			Vel = 0.12
409			0.0 1.40					19.312		K Factor =	0.32

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
426 to 476	18.69 19.53		1.64 1.64	2 2.157	T	12.307 12.307 13.137	120 0.0001	18.832 -0.364 0.001		Vel = 0.14	
476 to 410	19.53 17.59		0.0 1.64	2 2.157	E T	6.153 12.307 178.790	120 0	18.469 0.840 0.007		Vel = 0.14	
410			0.0 1.64					19.316		K Factor = 0.37	
427 to 477	18.69 19.53		1.90 1.9	2 2.157	T	12.307 12.307 13.137	120 0.0001	18.834 -0.364 0.001		Vel = 0.17	
477 to 411	19.53 17.59		0.0 1.9	2 2.157	E T	6.153 12.307 178.790	120 0.0001	18.471 0.840 0.009		Vel = 0.17	
411			0.0 1.90					19.320		K Factor = 0.43	
428 to 478	18.69 19.53		2.17 2.17	2 2.157	T	12.307 12.307 13.137	120 0.0001	18.835 -0.364 0.001		Vel = 0.19	
478 to 412	19.53 17.59		0.0 2.17	2 2.157	E T	6.153 12.307 178.790	120 0.0001	18.472 0.840 0.012		Vel = 0.19	
412			0.0 2.17					19.324		K Factor = 0.49	
429 to 479	18.69 19.53		2.34 2.34	2 2.157	T	12.307 12.307 13.137	120 0.0001	18.836 -0.364 0.001		Vel = 0.21	
479 to 413	19.53 17.59		0.0 2.34	2 2.157	E T	6.153 12.307 178.790	120 0.0001	18.473 0.840 0.013		Vel = 0.21	
413			0.0 2.34					19.326		K Factor = 0.53	
430 to 480	18.69 19.53		2.60 2.6	2 2.157	T	12.307 12.307 13.137	120 0.0001	18.837 -0.364 0.001		Vel = 0.23	
480 to 414	19.53 17.59		0.0 2.6	2 2.157	E T	6.153 12.307 178.790	120 0.0001	18.474 0.840 0.016		Vel = 0.23	
414			0.0 2.60					19.330		K Factor = 0.59	
431 to 481	18.69 19.53		2.90 2.9	2 2.157	T	12.307 12.307 13.137	120 0.0002	18.837 -0.364 0.002		Vel = 0.25	
481 to 415	19.53 17.59		0.0 2.9	2 2.157	E T	6.153 12.307 178.790	120 0.0001	18.475 0.840 0.020		Vel = 0.25	
			0.0								

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
415			2.90						19.335		K Factor = 0.66	
432 to 482	18.69 19.53		4.42	2	T	12.307	0.830 12.307 13.137	120	18.838 -0.364 0.003		Vel = 0.39	
482 to 416	19.53 17.59		0.0	2	E	6.153	160.330 6.153 166.483	120	18.477 0.840 0.040		Vel = 0.39	
416			0.0 4.42						19.357		K Factor = 1.00	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GR REC 12+1.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

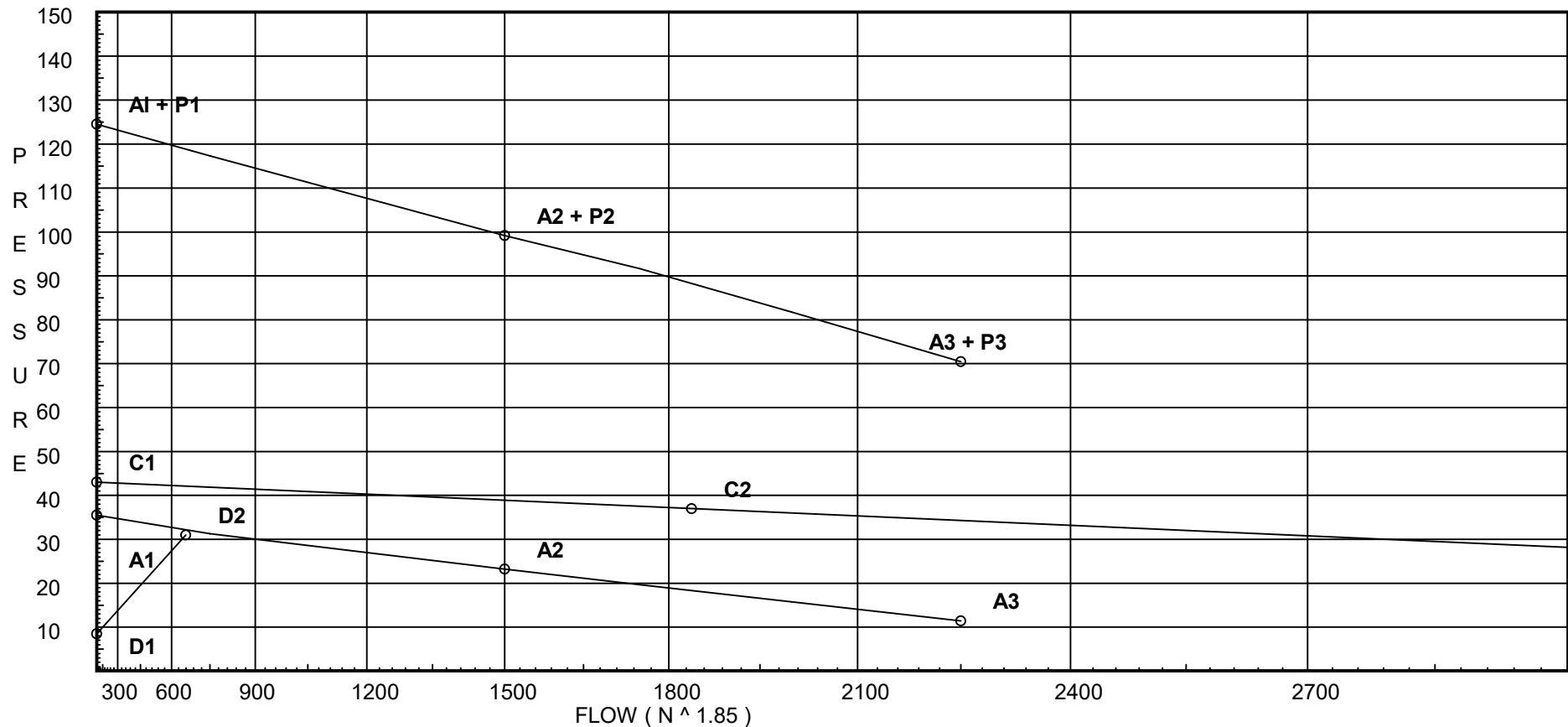
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.489
D2 - System Flow : 658.802
D2 - System Pressure : 30.990
Hose (Demand) :
D3 - System Demand : 658.802
Hose (Adj City) : 250
Safety Margin : 87.571



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			118.561	658.8	30.99
TEST	43.0	37	1839.0	41.371	908.8	41.371

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
401	17.6	16.8	7.0	44.45	0.01	100
402	17.6		11.28			
403	17.59		11.4			
404	17.59		11.5			
405	17.59		11.59			
406	17.59		11.68			
407	17.59		11.76			
408	17.59		11.85			
409	17.59		11.94			
410	17.59		12.04			
411	17.59		12.13			
412	17.59		12.23			
413	17.59		12.29			
414	17.59		12.38			
415	17.59		12.49			
416	17.59		13.02			
417	17.41		13.58			
TR4	17.24		19.17			
BR4	2.83		26.13			
BR3	2.83		26.25			
127	2.792		28.94			
128	2.0		29.54			
PO	1.08		30.99			
PI	1.08		31.92			
FLG	-5.0		35.06			
TEST	-2.0		41.37		250.0	
418	19.53		10.71			
419	18.69		11.09			
420	18.69		11.13			
421	18.69		11.18			
422	18.69		11.23			
423	18.69		11.28			
424	18.69		11.33			
425	18.69		11.38			
426	18.69		11.42			
427	18.69		11.46			
428	18.69		11.49			
429	18.69		11.5			
430	18.69		11.52			
431	18.69		11.54			
432	18.69		11.54			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
433	18.69		11.55			
434	19.53		11.28			
435	17.59		11.38			
436	17.59		11.32			
437	17.59		11.31			
453	17.59		11.29			
438	17.59		11.28			
454	17.59		11.28			
439	17.59		11.28			
440	17.59		11.28			
441	17.59		11.29			
442	17.59		11.29			
443	17.59		11.29			
444	17.59		11.29			
486	18.49		10.97			
485	18.63		10.91			
483	18.73		10.88			
484	18.86		10.83			
445	19.52		10.6			
446	19.52		10.6			
447	19.52		10.6			
448	19.52		10.6			
449	18.69		11.0			
450	18.69		11.01			
451	18.69		11.03			
452	18.69		11.06			
456	17.6	16.8	7.2	45.09	0.01	100
457	17.6		11.16			
507	18.45		10.92			
506	18.59		10.88			
505	18.73		10.84			
504	18.83		10.81			
467	19.53		10.62			
458	17.6	16.8	7.43	45.78	0.01	100
459	17.6		11.19			
455	19.53		10.67			
461	17.27	16.8	9.46	51.66	0.01	100
462	17.38	16.8	9.49	51.74	0.01	100
463	17.49	16.8	9.71	52.36	0.01	100
464	17.27	16.8	9.46	51.67	0.01	100
465	17.38	16.8	9.49	51.75	0.01	100
466	17.49	16.8	9.72	52.37	0.01	100
509	17.27	16.8	9.48	51.73	0.01	100
510	17.38	16.8	9.51	51.81	0.01	100
511	17.49	16.8	9.74	52.43	0.01	100
503	18.45		11.0			
502	18.59		10.95			
500	18.73		10.9			
501	18.83		10.86			
468	19.53		10.62			
512	17.6	16.8	11.09	55.94	0.01	100

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
508	18.45		10.88		
460	19.53		10.64		
490	18.49		10.97		
489	18.63		10.91		
488	18.73		10.88		
487	18.86		10.83		
469	19.53		10.76		
470	19.53		10.81		
471	19.53		10.86		
473	19.53		10.92		
472	17.6		11.76		
474	19.53		10.97		
475	19.53		11.02		
476	19.53		11.07		
477	19.53		11.11		
478	19.53		11.14		
479	19.53		11.16		
492	18.78		11.6		
491	18.64		11.68		
493	18.51		11.75		
494	18.36		11.83		
480	19.53		11.18		
495	18.78		11.65		
496	18.64		11.73		
497	18.51		11.81		
498	18.36		11.9		
481	19.53		11.2		
499	18.36		11.96		
482	19.53		11.25		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
401 to 402	17.6 17.6	16.80	44.45 44.45	1 1.049	T	5.0	2.500 5.000 7.500	120	7.000 0.0 4.276		Vel = 16.50	
402 to 403	17.6 17.59		-12.39 32.06	2 2.157	T	12.307	0.830 12.307 13.137	120	11.276 0.004 0.123		Vel = 2.81	
403 to 404	17.59 17.59		506.25 538.31	6 6.357			10.500 10.500	120	11.403 0.0 0.093		Vel = 5.44	
404 to 405	17.59 17.59		-7.18 531.13	6 6.357			10.500 10.500	120	11.496 0.0 0.092		Vel = 5.37	
405 to 406	17.59 17.59		-5.42 525.71	6 6.357			10.500 10.500	120	11.588 0.0 0.089		Vel = 5.31	
406 to 407	17.59 17.59		-3.31 522.4	6 6.357			10.500 10.500	120	11.677 0.0 0.088		Vel = 5.28	
407 to 408	17.59 17.59		1.96 524.36	6 6.357			10.500 10.500	120	11.765 0.0 0.089		Vel = 5.30	
408 to 409	17.59 17.59		4.56 528.92	6 6.357			10.500 10.500	120	11.854 0.0 0.091		Vel = 5.35	
409 to 410	17.59 17.59		6.44 535.36	6 6.357			10.500 10.500	120	11.945 0.0 0.092		Vel = 5.41	
410 to 411	17.59 17.59		8.13 543.49	6 6.357			10.500 10.500	120	12.037 0.0 0.095		Vel = 5.49	
411 to 412	17.59 17.59		9.77 553.26	6 6.357			10.500 10.500	120	12.132 0.0 0.098		Vel = 5.59	
412 to 413	17.59 17.59		11.40 564.66	6 6.357			6.170 6.170	120	12.230 0.0 0.060		Vel = 5.71	
413 to 414	17.59 17.59		12.42 577.08	6 6.357			9.000 9.000	120	12.290 0.0 0.092		Vel = 5.83	
414 to 415	17.59 17.59		13.94 591.02	6 6.357			10.000 10.000	120	12.382 0.0 0.105		Vel = 5.97	
415 to 416	17.59 17.59		15.67 606.69	6 6.357	T	37.72	10.000 37.720 47.720	120	12.487 0.0 0.530		Vel = 6.13	
416 to 417	17.59 17.41		24.23 630.92	6 6.357	E	17.603	23.300 17.603 40.903	120	13.017 0.078 0.488		Vel = 6.38	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
417 to TR4	17.41 17.24		27.88 658.8	6 6.357	6E 105.616	320.930 105.616 426.546	120 0.0129	13.583 0.074 5.514		Vel = 6.66	
TR4 to BR4	17.24 2.83		0.0 658.8	6 6.357	T G 37.72 3.772	14.410 41.492 55.902	120 0.0129	19.171 6.241 0.722		Vel = 6.66	
BR4 to BR3	2.83 2.83		0.0 658.8	4 4.26		1.250 1.250	120 0.0912	26.134 0.0 0.114		Vel = 14.83	
BR3 to 127	2.83 2.792		0.0 658.8	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0908	26.248 0.016 2.680		Vel = 14.83	
127 to 128	2.792 2		0.0 658.8	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0129	28.944 0.343 0.258		Vel = 6.66	
128 to PO	2 1.080		0.0 658.8	8 8.249	7E T B S 147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0036	29.545 0.398 1.047		Vel = 3.95	
PO			0.0 658.80					30.990		K Factor = 118.34	
System Demand Pressure								30.990			
Safety Margin								87.571			
Continuation Pressure								118.561			
Pressure @ Pump Outlet								118.561			
Pressure From Pump Curve								-86.640			
Pressure @ Pump Inlet								31.921			
PI to FLG	1.080 -5		0.0 658.8	8 8.249	5E G 4.698	105.706 110.404 139.154	120 0.0036	31.921 2.633 0.506		Vel = 3.95	
FLG to TEST	-5 -2		0.0 658.8	8 8.27	Zfh 2E 0.0 56.936	169.140 56.936 226.076	140 0.0027	35.060 5.701 0.610		* * Fixed Loss = 7 Vel = 3.93	
TEST			250.00 908.80					41.371		Qa = 250.00 K Factor = 141.29	
402 to 418	17.6 19.53		12.39 12.39	2 2.157	E 6.153	159.500 6.153 165.653	120 0.0016	11.276 -0.836 0.266		Vel = 1.09	
418 to 419	19.53 18.69		0.0 12.39	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0016	10.706 0.364 0.021		Vel = 1.09	
419 to 420	18.69 18.69		108.10 120.49	4 4.26		10.500 10.500	120 0.0039	11.091 0.0 0.041		Vel = 2.71	
420 to 421	18.69 18.69		7.18 127.67	4 4.26		10.500 10.500	120 0.0044	11.132 0.0 0.046		Vel = 2.87	
421 to 422	18.69 18.69		5.42 133.09	4 4.26		10.500 10.500	120 0.0047	11.178 0.0 0.049		Vel = 3.00	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
422 to 423	18.69 18.69		3.31 136.4	4 4.26			10.500 10.500	120 0.0050	11.227 0.0 0.052		Vel = 3.07	
423 to 424	18.69 18.69		-1.96 134.44	4 4.26			10.500 10.500	120 0.0048	11.279 0.0 0.050		Vel = 3.03	
424 to 425	18.69 18.69		-4.56 129.88	4 4.26			10.500 10.500	120 0.0046	11.329 0.0 0.048		Vel = 2.92	
425 to 426	18.69 18.69		-6.44 123.44	4 4.26			10.500 10.500	120 0.0041	11.377 0.0 0.043		Vel = 2.78	
426 to 427	18.69 18.69		-8.13 115.31	4 4.26			10.500 10.500	120 0.0036	11.420 0.0 0.038		Vel = 2.60	
427 to 428	18.69 18.69		-9.76 105.55	4 4.26			10.500 10.500	120 0.0030	11.458 0.0 0.032		Vel = 2.38	
428 to 429	18.69 18.69		-11.41 94.14	4 4.26			6.170 6.170	120 0.0024	11.490 0.0 0.015		Vel = 2.12	
429 to 430	18.69 18.69		-12.42 81.72	4 4.26			9.000 9.000	120 0.0019	11.505 0.0 0.017		Vel = 1.84	
430 to 431	18.69 18.69		-13.94 67.78	4 4.26			10.000 10.000	120 0.0014	11.522 0.0 0.014		Vel = 1.53	
431 to 432	18.69 18.69		-15.67 52.11	4 4.26			10.000 10.000	120 0.0008	11.536 0.0 0.008		Vel = 1.17	
432 to 433	18.69 18.69		-24.23 27.88	4 4.26			9.000 9.000	120 0.0003	11.544 0.0 0.003		Vel = 0.63	
433 to 434	18.69 19.53		0.0 27.88	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0072	11.547 -0.364 0.094		Vel = 2.45	
434 to 417	19.53 17.41		0.0 27.88	2 2.157	E T	6.153 12.307	174.640 18.460 193.100	120 0.0072	11.277 0.918 1.388		Vel = 2.45	
417			0.0 27.88						13.583		K Factor = 7.56	
403 to 435	17.59 17.59		-506.25 -506.25	6 6.357			2.500 2.500	120 -0.0080	11.403 0.0 -0.020		Vel = 5.12	
435 to 436	17.59 17.59		0.0 -506.25	6 6.357			8.000 8.000	120 -0.0079	11.383 0.0 -0.063		Vel = 5.12	
436 to 437	17.59 17.59		32.25 -474.0	6 6.357			1.250 1.250	120 -0.0072	11.320 0.0 -0.009		Vel = 4.79	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
437 to 453	17.59 17.59		155.97 -318.03	6 6.357			7.250 7.250	120 -0.0034	11.311 0.0 -0.025		Vel = 3.21	
453 to 438	17.59 17.59		155.79 -162.24	6 6.357			2.000 2.000	120 -0.0010	11.286 0.0 -0.002		Vel = 1.64	
438 to 454	17.59 17.59		40.83 -121.41	6 6.357			4.000 4.000	120 -0.0005	11.284 0.0 -0.002		Vel = 1.23	
454 to 439	17.59 17.59		155.77 34.36	6 6.357			6.500 6.500	120 0.0002	11.282 0.0 0.001		Vel = 0.35	
439 to 440	17.59 17.59		31.81 66.17	6 6.357			10.500 10.500	120 0.0001	11.283 0.0 0.001		Vel = 0.67	
440 to 441	17.59 17.59		-9.55 56.62	6 6.357			8.000 8.000	120 0.0002	11.284 0.0 0.002		Vel = 0.57	
441 to 442	17.59 17.59		-14.43 42.19	6 6.357			8.000 8.000	120 0	11.286 0.0 0.0		Vel = 0.43	
442 to 443	17.59 17.59		-14.17 28.02	6 6.357			9.000 9.000	120 0.0001	11.286 0.0 0.001		Vel = 0.28	
443 to 444	17.59 17.59		-14.03 13.99	6 6.357			9.000 9.000	120 0	11.287 0.0 0.0		Vel = 0.14	
444 to 486	17.59 18.49		0.0 13.99	2.5 2.635	T	16.474	74.680 16.474 91.154	120 0.0008	11.287 -0.390 0.069		Vel = 0.82	
486 to 485	18.49 18.63		0.0 13.99	2.5 2.635			11.420 11.420	120 0.0008	10.966 -0.061 0.009		Vel = 0.82	
485 to 483	18.63 18.73		0.0 13.99	2.5 2.635			8.500 8.500	120 0.0007	10.914 -0.043 0.006		Vel = 0.82	
483 to 484	18.73 18.86		0.0 13.99	2.5 2.635			11.000 11.000	120 0.0007	10.877 -0.056 0.008		Vel = 0.82	
484 to 445	18.86 19.52		0.0 13.99	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0008	10.829 -0.286 0.054		Vel = 0.82	
445 to 446	19.52 19.52		0.0 13.99	4 4.26			9.000 9.000	120 0.0001	10.597 0.0 0.001		Vel = 0.31	
446 to 447	19.52 19.52		14.03 28.02	4 4.26			9.000 9.000	120 0.0002	10.598 0.0 0.002		Vel = 0.63	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
447 to 448	19.52 19.52		14.17 42.19	4 4.26		8.000 8.000	120 0.0006	10.600 0.0 0.005		Vel = 0.95	
448 to 449	19.52 18.69		14.43 56.62	4 4.26	2E 26.334	8.830 26.334 35.164	120 0.0010	10.605 0.359 0.034		Vel = 1.27	
449 to 450	18.69 18.69		9.55 66.17	4 4.26		10.500 10.500	120 0.0013	10.998 0.0 0.014		Vel = 1.49	
450 to 451	18.69 18.69		13.28 79.45	4 4.26		10.500 10.500	120 0.0018	11.012 0.0 0.019		Vel = 1.79	
451 to 452	18.69 18.69		15.12 94.57	4 4.26		10.500 10.500	120 0.0025	11.031 0.0 0.026		Vel = 2.13	
452 to 419	18.69 18.69		13.54 108.11	4 4.26		10.500 10.500	120 0.0032	11.057 0.0 0.034		Vel = 2.43	
419			0.0 108.11					11.091		K Factor = 32.46	
456 to 457	17.6 17.6	16.80	45.10 45.1	1 1.049	T 5.0	1.750 5.000 6.750	120 0.5856	7.205 0.0 3.953		Vel = 16.74	
457 to 439	17.6 17.59		-13.29 31.81	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0092	11.158 0.004 0.121		Vel = 2.79	
439			0.0 31.81					11.283		K Factor = 9.47	
457 to 507	17.6 18.45		13.29 13.29	2 2.157		71.010 71.010	120 0.0018	11.158 -0.368 0.129		Vel = 1.17	
507 to 506	18.45 18.59		0.0 13.29	2 2.157		11.000 11.000	120 0.0019	10.919 -0.061 0.021		Vel = 1.17	
506 to 505	18.59 18.73		0.0 13.29	2 2.157		11.500 11.500	120 0.0018	10.879 -0.061 0.021		Vel = 1.17	
505 to 504	18.73 18.83		0.0 13.29	2 2.157		8.500 8.500	120 0.0018	10.839 -0.043 0.015		Vel = 1.17	
504 to 467	18.83 19.53		0.0 13.29	2 2.157	E 6.153	57.490 6.153 63.643	120 0.0018	10.811 -0.303 0.116		Vel = 1.17	
467 to 450	19.53 18.69		0.0 13.29	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0018	10.624 0.364 0.024		Vel = 1.17	
450			0.0 13.29					11.012		K Factor = 4.00	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
458 to 459	17.6 17.6	16.80	45.78 45.78	1 1.049	T	5.0	1.250 5.000 6.250	120 0.6024	7.427 0.0 3.765			
										Vel =	16.99	
459 to 436	17.6 17.59		-13.53 32.25	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0094	11.192 0.004 0.124			
										Vel =	2.83	
436			0.0 32.25						11.320		K Factor =	9.59
459 to 455	17.6 19.53		13.54 13.54	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0019	11.192 -0.836 0.313			
										Vel =	1.19	
455 to 452	19.53 18.69		0.0 13.54	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0018	10.669 0.364 0.024			
										Vel =	1.19	
452			0.0 13.54						11.057		K Factor =	4.07
461 to 462	17.27 17.38	16.80	51.66 51.66	2.5 2.635			9.000 9.000	120 0.0086	9.457 -0.048 0.077			
										Vel =	3.04	
462 to 463	17.38 17.49	16.80	51.75 103.41	2.5 2.635			9.000 9.000	120 0.0307	9.486 -0.048 0.276			
										Vel =	6.08	
463 to 454	17.49 17.59	16.80	52.36 155.77	2.5 2.635	T	16.474	8.170 16.474 24.644	120 0.0654	9.714 -0.043 1.611			
										Vel =	9.16	
454			0.0 155.77						11.282		K Factor =	46.38
464 to 465	17.27 17.38	16.80	51.67 51.67	2.5 2.635			9.000 9.000	120 0.0084	9.461 -0.048 0.076			
										Vel =	3.04	
465 to 466	17.38 17.49	16.80	51.76 103.43	2.5 2.635			9.000 9.000	120 0.0308	9.489 -0.048 0.277			
										Vel =	6.09	
466 to 453	17.49 17.59	16.80	52.37 155.8	2.5 2.635	T	16.474	8.170 16.474 24.644	120 0.0654	9.718 -0.043 1.611			
										Vel =	9.17	
453			0.0 155.80						11.286		K Factor =	46.38
509 to 510	17.27 17.38	16.80	51.73 51.73	2.5 2.635			9.000 9.000	120 0.0086	9.481 -0.048 0.077			
										Vel =	3.04	
510 to 511	17.38 17.49	16.80	51.81 103.54	2.5 2.635			9.000 9.000	120 0.0308	9.510 -0.048 0.277			
										Vel =	6.09	
511 to 437	17.49 17.59	16.80	52.42 155.96	2.5 2.635	T	16.474	8.170 16.474 24.644	120 0.0655	9.739 -0.043 1.615			
										Vel =	9.18	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
437			0.0 155.96					11.311		K Factor = 46.37	
440 to 503	17.59 18.45		9.55	2	T 12.307	71.840 12.307 84.147	120	11.284 -0.372		Vel = 0.84	
503 to 502	18.45 18.59		0.0	2		11.000	120	10.995 -0.061		Vel = 0.84	
502 to 500	18.59 18.73		9.55	2.157		11.000	0.0011	0.012		Vel = 0.84	
500 to 501	18.73 18.83		0.0	2		11.500	120	10.946 -0.061		Vel = 0.84	
501 to 468	18.83 19.53		9.55	2.157		8.500	120	10.896 -0.043		Vel = 0.84	
468 to 449	19.53 18.69		0.0	2	E 6.153	57.490 6.153 63.643	120	10.862 -0.303		Vel = 0.84	
449			0.0 9.55					10.998		K Factor = 2.88	
438 to 512	17.59 17.6		-40.83	2	T 12.307	0.830 12.307 13.137	120	11.284 -0.004		Vel = 3.58	
512 to 508	17.6 18.45	16.80	55.95	2		71.010	120	11.089 -0.368		Vel = 1.33	
508 to 460	18.45 19.53		15.12	2.157		71.010	0.0023	0.164		Vel = 1.33	
460 to 451	19.53 18.69		0.0	2	E 6.153	88.490 6.153 94.643	120	10.885 -0.468		Vel = 1.33	
451			0.0 15.12					11.031		K Factor = 4.55	
441 to 448	17.59 19.52		14.43	2.5	2T 32.948	160.340 32.948 193.288	120	11.286 -0.836		Vel = 0.85	
448			0.0 14.43					10.605		K Factor = 4.43	
442 to 447	17.59 19.52		14.17	2.5	2T 32.948	160.340 32.948 193.288	120	11.286 -0.836		Vel = 0.83	
447			0.0 14.17					10.600		K Factor = 4.35	
443 to 490	17.59 18.49		14.03	2.5	T 16.474	74.680 16.474 91.154	120	11.287 -0.390		Vel = 0.83	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
490 to 489	18.49 18.63		0.0 14.03	2.5 2.635			11.420 11.420	120 0.0008	10.966 -0.061 0.009		Vel = 0.83	
489 to 488	18.63 18.73		0.0 14.03	2.5 2.635			8.500 8.500	120 0.0007	10.914 -0.043 0.006		Vel = 0.83	
488 to 487	18.73 18.86		0.0 14.03	2.5 2.635			11.000 11.000	120 0.0008	10.877 -0.056 0.009		Vel = 0.83	
487 to 446	18.86 19.52		0.0 14.03	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0008	10.830 -0.286 0.054		Vel = 0.83	
446			0.0 14.03						10.598		K Factor = 4.31	
404 to 469	17.59 19.53		7.18 7.18	2 2.157	T E	12.307 6.153	160.330 18.460 178.790	120 0.0006	11.496 -0.840 0.104		Vel = 0.63	
469 to 420	19.53 18.69		0.0 7.18	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0006	10.760 0.364 0.008		Vel = 0.63	
420			0.0 7.18						11.132		K Factor = 2.15	
405 to 470	17.59 19.53		5.42 5.42	2 2.157	T E	12.307 6.153	160.330 18.460 178.790	120 0.0003	11.588 -0.840 0.061		Vel = 0.48	
470 to 421	19.53 18.69		0.0 5.42	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0004	10.809 0.364 0.005		Vel = 0.48	
421			0.0 5.42						11.178		K Factor = 1.62	
406 to 471	17.59 19.53		3.31 3.31	2 2.157	T E	12.307 6.153	160.330 18.460 178.790	120 0.0001	11.677 -0.840 0.025		Vel = 0.29	
471 to 422	19.53 18.69		0.0 3.31	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	10.862 0.364 0.001		Vel = 0.29	
422			0.0 3.31						11.227		K Factor = 0.99	
423 to 473	18.69 19.53		1.96 1.96	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	11.279 -0.364 0.001		Vel = 0.17	
473 to 472	19.53 17.6		0.0 1.96	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0001	10.916 0.836 0.009		Vel = 0.17	
472 to 407	17.6 17.59		0.0 1.96	2.5 2.635	T	16.474	0.830 16.474 17.304	120 0	11.761 0.004 0.0		Vel = 0.12	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
407			0.0 1.96						11.765		K Factor = 0.57	
424 to 474	18.69 19.53		4.56	2	T	12.307	0.830 12.307 13.137	120	11.329 -0.364 0.004		Vel = 0.40	
474 to 408	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	10.969 0.840 0.045		Vel = 0.40	
408			0.0 4.56						11.854		K Factor = 1.32	
425 to 475	18.69 19.53		6.44	2	T	12.307	0.830 12.307 13.137	120	11.377 -0.364 0.006		Vel = 0.57	
475 to 409	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	11.019 0.840 0.086		Vel = 0.57	
409			0.0 6.44						11.945		K Factor = 1.86	
426 to 476	18.69 19.53		8.13	2	T	12.307	0.830 12.307 13.137	120	11.420 -0.364 0.010		Vel = 0.71	
476 to 410	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	11.066 0.840 0.131		Vel = 0.71	
410			0.0 8.13						12.037		K Factor = 2.34	
427 to 477	18.69 19.53		9.77	2	T	12.307	0.830 12.307 13.137	120	11.458 -0.364 0.013		Vel = 0.86	
477 to 411	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	11.107 0.840 0.185		Vel = 0.86	
411			0.0 9.77						12.132		K Factor = 2.80	
428 to 478	18.69 19.53		11.41	2	T	12.307	0.830 12.307 13.137	120	11.490 -0.364 0.018		Vel = 1.00	
478 to 412	19.53 17.59		0.0	2	E T	6.153 12.307	160.330 18.460 178.790	120	11.144 0.840 0.246		Vel = 1.00	
412			0.0 11.41						12.230		K Factor = 3.26	
429 to 479	18.69 19.53		12.42	2	T	12.307	0.830 12.307 13.137	120	11.505 -0.364 0.022		Vel = 1.09	
479 to 492	19.53 18.78		0.0	2	E	6.153	62.000 6.153 68.153	120	11.163 0.325 0.109		Vel = 1.09	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
492 to 491	18.78 18.64		0.0 12.42	2 2.157		11.000 11.000	120 0.0015	11.597 0.061 0.017		Vel = 1.09	
491 to 493	18.64 18.51		0.0 12.42	2 2.157		11.330 11.330	120 0.0017	11.675 0.056 0.019		Vel = 1.09	
493 to 494	18.51 18.36		0.0 12.42	2 2.157		12.000 12.000	120 0.0016	11.750 0.065 0.019		Vel = 1.09	
494 to 413	18.36 17.59		0.0 12.42	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0016	11.834 0.333 0.123		Vel = 1.09	
413			0.0 12.42					12.290		K Factor = 3.54	
430 to 480	18.69 19.53		13.94 13.94	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0021	11.522 -0.364 0.027		Vel = 1.22	
480 to 495	19.53 18.78		0.0 13.94	2 2.157	E 6.153	62.000 6.153 68.153	120 0.0020	11.185 0.325 0.136		Vel = 1.22	
495 to 496	18.78 18.64		0.0 13.94	2 2.157		11.000 11.000	120 0.0019	11.646 0.061 0.021		Vel = 1.22	
496 to 497	18.64 18.51		0.0 13.94	2 2.157		11.330 11.330	120 0.0020	11.728 0.056 0.023		Vel = 1.22	
497 to 498	18.51 18.36		0.0 13.94	2 2.157		12.000 12.000	120 0.0020	11.807 0.065 0.024		Vel = 1.22	
498 to 414	18.36 17.59		0.0 13.94	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0020	11.896 0.333 0.153		Vel = 1.22	
414			0.0 13.94					12.382		K Factor = 3.96	
431 to 481	18.69 19.53		15.67 15.67	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0025	11.536 -0.364 0.033		Vel = 1.38	
481 to 499	19.53 18.36		0.0 15.67	2 2.157	E 6.153	96.330 6.153 102.483	120 0.0025	11.205 0.507 0.253		Vel = 1.38	
499 to 415	18.36 17.59		0.0 15.67	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0025	11.965 0.333 0.189		Vel = 1.38	
415			0.0 15.67					12.487		K Factor = 4.43	
432 to 482	18.69 19.53		24.24 24.24	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0056	11.544 -0.364 0.073		Vel = 2.13	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 16
Date 050124

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	*****
482 to 416	19.53 17.59		0.0 24.24	2 2.157	E	6.153	160.330 6.153 166.483	120 0.0056	11.253 0.840 0.924		Vel = 2.13	
416			0.0 24.24						13.017		K Factor = 6.72	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GR SALES 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

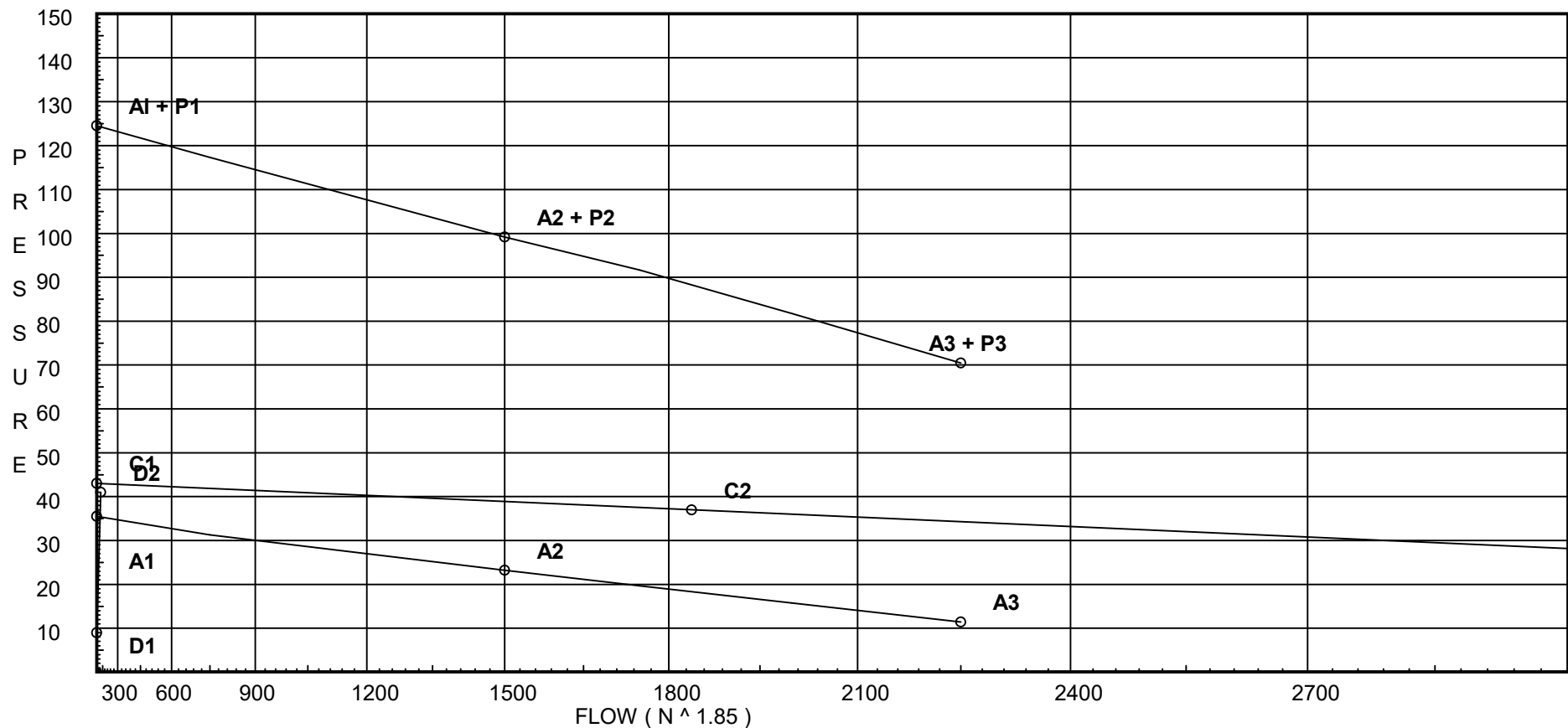
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.978
D2 - System Flow : 122.751
D2 - System Pressure : 41.003
Hose (Demand) :
D3 - System Demand : 122.751
Hose (Adj City) : 250
Safety Margin : 82.888



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.89	122.75	41.003
TEST	43.0	37	1839.0	42.687	372.75	42.687

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>	
500	18.73	11.2	30.0	61.34	0.01	130
501	18.83		30.23			
468	19.53		32.0			
449	18.69		32.79			
448	19.52		32.44			
447	19.52		32.44			
446	19.52		32.44			
445	19.52		32.44			
484	18.86		32.73			
483	18.73		32.79			
485	18.63		32.83			
486	18.49		32.89			
444	17.59		33.29			
443	17.59		33.29			
442	17.59		33.29			
441	17.59		33.29			
440	17.59		33.29			
439	17.59		33.29			
438	17.59		33.3			
437	17.59		33.3			
436	17.59		33.3			
435	17.59		33.3			
403	17.59		33.3			
404	17.59		33.3			
405	17.59		33.31			
406	17.59		33.31			
407	17.59		33.32			
408	17.59		33.32			
409	17.59		33.32			
410	17.59		33.33			
411	17.59		33.33			
412	17.59		33.33			
413	17.59		33.34			
414	17.59		33.34			
415	17.59		33.35			
416	17.59		33.37			
417	17.41		33.47			
TR4	17.24		33.79			
BR4	2.83		40.06			
BR3	2.83		40.07			
127	2.792		40.2			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
128	2.0		40.56			
PO	1.08		41.0			
PI	1.08		35.0			
FLG	-5.0		37.65			
TEST	-2.0		42.69	250.0		
502	18.59	11.2	30.06	61.41	0.01	130
503	18.45		30.44			
450	18.69		32.8			
451	18.69		32.8			
452	18.69		32.81			
419	18.69		32.82			
420	18.69		32.82			
421	18.69		32.82			
422	18.69		32.83			
423	18.69		32.83			
424	18.69		32.83			
425	18.69		32.84			
426	18.69		32.84			
427	18.69		32.84			
428	18.69		32.84			
429	18.69		32.84			
430	18.69		32.84			
431	18.69		32.84			
432	18.69		32.84			
433	18.69		32.84			
434	19.53		32.49			
467	19.53		32.44			
504	18.83		32.74			
505	18.73		32.79			
506	18.59		32.85			
507	18.45		32.91			
460	19.53		32.44			
508	18.45		32.92			
459	17.6		33.29			
455	19.53		32.45			
454	17.6		33.29			
418	19.53		32.45			
402	17.6		33.3			
469	19.53		32.46			
470	19.53		32.46			
471	19.53		32.46			
473	19.53		32.47			
472	17.6		33.31			
474	19.53		32.47			
475	19.53		32.47			
476	19.53		32.48			
477	19.53		32.48			
478	19.53		32.48			
479	19.53		32.48			
492	18.78		32.81			
491	18.64		32.87			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
493	18.51		32.93		
494	18.36		33.0		
480	19.53		32.48		
495	18.78		32.81		
496	18.64		32.88		
497	18.51		32.93		
498	18.36		33.0		
481	19.53		32.48		
499	18.36		33.0		
482	19.53		32.48		
487	18.86		32.73		
488	18.73		32.79		
489	18.63		32.83		
490	18.49		32.89		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
500 to 501	18.73 18.83	11.20	63.06 63.06	2 2.157			8.500 8.500	120 0.0325	30.000 -0.043 0.276		Vel = 5.54	
501 to 468	18.83 19.53		0.0 63.06	2 2.157	E	6.153	57.490 6.153 63.643	120 0.0325	30.233 -0.303 2.071		Vel = 5.54	
468 to 449	19.53 18.69		0.0 63.06	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0325	32.001 0.364 0.427		Vel = 5.54	
449 to 448	18.69 19.52		-45.42 17.64	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0001	32.792 -0.359 0.003		Vel = 0.40	
448 to 447	19.52 19.52		-4.49 13.15	4 4.26			8.000 8.000	120 0.0001	32.436 0.0 0.001		Vel = 0.30	
447 to 446	19.52 19.52		-4.42 8.73	4 4.26			9.000 9.000	120 0	32.437 0.0 0.0		Vel = 0.20	
446 to 445	19.52 19.52		-4.37 4.36	4 4.26			9.000 9.000	120 0	32.437 0.0 0.0		Vel = 0.10	
445 to 484	19.52 18.86		0.0 4.36	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0001	32.437 0.286 0.006		Vel = 0.26	
484 to 483	18.86 18.73		0.0 4.36	2.5 2.635			11.000 11.000	120 0.0001	32.729 0.056 0.001		Vel = 0.26	
483 to 485	18.73 18.63		0.0 4.36	2.5 2.635			8.500 8.500	120 0.0001	32.786 0.043 0.001		Vel = 0.26	
485 to 486	18.63 18.49		0.0 4.36	2.5 2.635			11.420 11.420	120 0.0001	32.830 0.061 0.001		Vel = 0.26	
486 to 444	18.49 17.59		0.0 4.36	2.5 2.635	T	16.474	74.680 16.474 91.154	120 0.0001	32.892 0.390 0.008		Vel = 0.26	
444 to 443	17.59 17.59		0.0 4.36	6 6.357			9.000 9.000	120 0	33.290 0.0 0.0		Vel = 0.04	
443 to 442	17.59 17.59		4.37 8.73	6 6.357			9.000 9.000	120 0	33.290 0.0 0.0		Vel = 0.09	
442 to 441	17.59 17.59		4.42 13.15	6 6.357			8.000 8.000	120 0	33.290 0.0 0.0		Vel = 0.13	
441 to 440	17.59 17.59		4.49 17.64	6 6.357			8.000 8.000	120 0	33.290 0.0 0.0		Vel = 0.18	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
440 to 439	17.59 17.590		59.70 77.34	6 6.357		10.500 10.500	120 0.0003	33.290 0.0 0.003		Vel = 0.78	
439 to 438	17.590 17.59		2.65 79.99	6 6.357		10.500 10.500	120 0.0002	33.293 0.0 0.002		Vel = 0.81	
438 to 437	17.59 17.59		2.38 82.37	6 6.357		9.250 9.250	120 0.0003	33.295 0.0 0.003		Vel = 0.83	
437 to 436	17.59 17.59		0.0 82.37	6 6.357		1.250 1.250	120 0	33.298 0.0 0.0		Vel = 0.83	
436 to 435	17.59 17.59		2.14 84.51	6 6.357		8.000 8.000	120 0.0004	33.298 0.0 0.003		Vel = 0.85	
435 to 403	17.59 17.59		0.0 84.51	6 6.357		2.500 2.500	120 0	33.301 0.0 0.0		Vel = 0.85	
403 to 404	17.59 17.59		1.95 86.46	6 6.357		10.500 10.500	120 0.0003	33.301 0.0 0.003		Vel = 0.87	
404 to 405	17.59 17.59		1.82 88.28	6 6.357		10.500 10.500	120 0.0004	33.304 0.0 0.004		Vel = 0.89	
405 to 406	17.59 17.59		1.72 90.0	6 6.357		10.500 10.500	120 0.0003	33.308 0.0 0.003		Vel = 0.91	
406 to 407	17.59 17.59		1.69 91.69	6 6.357		10.500 10.500	120 0.0004	33.311 0.0 0.004		Vel = 0.93	
407 to 408	17.59 17.59		1.74 93.43	6 6.357		10.500 10.500	120 0.0003	33.315 0.0 0.003		Vel = 0.94	
408 to 409	17.59 17.59		1.79 95.22	6 6.357		10.500 10.500	120 0.0004	33.318 0.0 0.004		Vel = 0.96	
409 to 410	17.59 17.59		1.91 97.13	6 6.357		10.500 10.500	120 0.0004	33.322 0.0 0.004		Vel = 0.98	
410 to 411	17.59 17.59		2.07 99.2	6 6.357		10.500 10.500	120 0.0004	33.326 0.0 0.004		Vel = 1.00	
411 to 412	17.59 17.59		2.27 101.47	6 6.357		10.500 10.500	120 0.0004	33.330 0.0 0.004		Vel = 1.03	
412 to 413	17.59 17.59		2.50 103.97	6 6.357		6.170 6.170	120 0.0005	33.334 0.0 0.003		Vel = 1.05	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
413 to 414	17.59 17.59		2.65 106.62	6 6.357		9.000 9.000	120 0.0004	33.337 0.0 0.004		Vel = 1.08	
414 to 415	17.59 17.59		2.90 109.52	6 6.357		10.000 10.000	120 0.0005	33.341 0.0 0.005		Vel = 1.11	
415 to 416	17.59 17.59		3.18 112.7	6 6.357	T 37.72	10.000 37.720 47.720	120 0.0005	33.346 0.0 0.023		Vel = 1.14	
416 to 417	17.59 17.41		4.71 117.41	6 6.357	E 17.603	23.300 17.603 40.903	120 0.0005	33.369 0.078 0.022		Vel = 1.19	
417 to TR4	17.41 17.24		5.34 122.75	6 6.357	6E 105.616	320.930 105.616 426.546	120 0.0006	33.469 0.074 0.246		Vel = 1.24	
TR4 to BR4	17.24 2.83		0.0 122.75	6 6.357	T 37.72 G 3.772	14.410 41.492 55.902	120 0.0006	33.789 6.241 0.032		Vel = 1.24	
BR4 to BR3	2.83 2.83		0.0 122.75	4 4.26		1.250 1.250	120 0.0040	40.062 0.0 0.005		Vel = 2.76	
BR3 to 127	2.83 2.792		0.0 122.75	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0041	40.067 0.016 0.120		Vel = 2.76	
127 to 128	2.792 2		0.0 122.75	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0006	40.203 0.343 0.012		Vel = 1.24	
128 to PO	2 1.080		0.0 122.75	8 8.249	7E 147.988 T 41.108 B 14.094 S 52.853	31.833 256.043 287.876	120 0.0002	40.558 0.398 0.047		Vel = 0.74	
PO			0.0 122.75					41.003		K Factor = 19.17	
System Demand Pressure								41.003			
Safety Margin								82.888			
Continuation Pressure								123.890			
Pressure @ Pump Outlet								123.890			
Pressure From Pump Curve								-88.894			
Pressure @ Pump Inlet								34.997			
PI to FLG	1.080 -5		0.0 122.75	8 8.249	5E 105.706 G 4.698	28.750 110.404 139.154	120 0.0002	34.997 2.633 0.022		Vel = 0.74	
FLG to TEST	-5 -2		0.0 122.75	8 8.27	Zfh 0.0 2E 56.936	169.140 56.936 226.076	140 0.0001	37.652 5.008 0.026		* * Fixed Loss = 6.307 Vel = 0.73	
TEST			250.00 372.75					42.686		Qa = 250.00 K Factor = 57.05	
500 to 502	18.73 18.59		-1.71 -1.71	2 2.157		11.500 11.500	120 -0.0001	30.000 0.061 -0.001		Vel = 0.15	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
502 to 503	18.59 18.45	11.20	61.40 59.69	2 2.157		11.000 11.000	120 0.0294	30.060 0.061 0.323		Vel = 5.24	
503 to 440	18.45 17.59		0.0 59.69	2 2.157	T 12.307	71.840 12.307 84.147	120 0.0294	30.444 0.372 2.474		Vel = 5.24	
440			0.0 59.69					33.290		K Factor = 10.35	
449 to 450	18.69 18.69		45.41 45.41	4 4.26		10.500 10.500	120 0.0006	32.792 0.0 0.006		Vel = 1.02	
450 to 451	18.69 18.69		-2.65 42.76	4 4.26		10.500 10.500	120 0.0006	32.798 0.0 0.006		Vel = 0.96	
451 to 452	18.69 18.69		-2.38 40.38	4 4.26		10.500 10.500	120 0.0006	32.804 0.0 0.006		Vel = 0.91	
452 to 419	18.69 18.69		-2.14 38.24	4 4.26		10.500 10.500	120 0.0005	32.810 0.0 0.005		Vel = 0.86	
419 to 420	18.69 18.69		-1.95 36.29	4 4.26		10.500 10.500	120 0.0004	32.815 0.0 0.004		Vel = 0.82	
420 to 421	18.69 18.69		-1.81 34.48	4 4.26		10.500 10.500	120 0.0004	32.819 0.0 0.004		Vel = 0.78	
421 to 422	18.69 18.69		-1.73 32.75	4 4.26		10.500 10.500	120 0.0004	32.823 0.0 0.004		Vel = 0.74	
422 to 423	18.69 18.69		-1.69 31.06	4 4.26		10.500 10.500	120 0.0003	32.827 0.0 0.003		Vel = 0.70	
423 to 424	18.69 18.69		-1.74 29.32	4 4.26		10.500 10.500	120 0.0004	32.830 0.0 0.004		Vel = 0.66	
424 to 425	18.69 18.69		-1.79 27.53	4 4.26		10.500 10.500	120 0.0002	32.834 0.0 0.002		Vel = 0.62	
425 to 426	18.69 18.69		-1.91 25.62	4 4.26		10.500 10.500	120 0.0002	32.836 0.0 0.002		Vel = 0.58	
426 to 427	18.69 18.69		-2.07 23.55	4 4.26		10.500 10.500	120 0.0002	32.838 0.0 0.002		Vel = 0.53	
427 to 428	18.69 18.69		-2.27 21.28	4 4.26		10.500 10.500	120 0.0002	32.840 0.0 0.002		Vel = 0.48	
428 to 429	18.69 18.69		-2.50 18.78	4 4.26		6.170 6.170	120 0.0002	32.842 0.0 0.001		Vel = 0.42	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
429 to 430	18.69 18.69		-2.65 16.13	4 4.26		9.000 9.000	120 0.0001	32.843 0.0 0.001		Vel = 0.36	
430 to 431	18.69 18.69		-2.90 13.23	4 4.26		10.000 10.000	120 0	32.844 0.0 0.0		Vel = 0.30	
431 to 432	18.69 18.69		-3.18 10.05	4 4.26		10.000 10.000	120 0.0001	32.844 0.0 0.001		Vel = 0.23	
432 to 433	18.69 18.69		-4.71 5.34	4 4.26		9.000 9.000	120 0	32.845 0.0 0.0		Vel = 0.12	
433 to 434	18.69 19.53		0.0 5.34	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0004	32.845 -0.364 0.005		Vel = 0.47	
434 to 417	19.53 17.41		0.0 5.34	2 2.157	E 6.153 T 12.307	174.640 18.460 193.100	120 0.0003	32.486 0.918 0.065		Vel = 0.47	
417			0.0 5.34					33.469		K Factor = 0.92	
450 to 467	18.69 19.53		2.66 2.66	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	32.798 -0.364 0.002		Vel = 0.23	
467 to 504	19.53 18.83		0.0 2.66	2 2.157	E 6.153	57.490 6.153 63.643	120 0.0001	32.436 0.303 0.006		Vel = 0.23	
504 to 505	18.83 18.73		0.0 2.66	2 2.157		8.500 8.500	120 0.0001	32.745 0.043 0.001		Vel = 0.23	
505 to 506	18.73 18.59		0.0 2.66	2 2.157		11.500 11.500	120 0.0001	32.789 0.061 0.001		Vel = 0.23	
506 to 507	18.59 18.45		0.0 2.66	2 2.157		11.000 11.000	120 0	32.851 0.061 0.0		Vel = 0.23	
507 to 439	18.45 17.590		0.0 2.66	2 2.157	T 12.307	71.840 12.307 84.147	120 0.0001	32.912 0.372 0.009		Vel = 0.23	
439			0.0 2.66					33.293		K Factor = 0.46	
451 to 460	18.69 19.53		2.38 2.38	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	32.804 -0.364 0.002		Vel = 0.21	
460 to 508	19.53 18.45		0.0 2.38	2 2.157	E 6.153	88.490 6.153 94.643	120 0.0001	32.442 0.468 0.007		Vel = 0.21	
508 to 459	18.45 17.6		0.0 2.38	2 2.157		71.010 71.010	120 0.0001	32.917 0.368 0.005		Vel = 0.21	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
459 to 438	17.6 17.59		0.0 2.38	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	33.290 0.004 0.001		Vel = 0.21	
438			0.0 2.38						33.295		K Factor = 0.41	
452 to 455	18.69 19.53		2.14 2.14	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	32.810 -0.364 0.001		Vel = 0.19	
455 to 454	19.53 17.6		0.0 2.14	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0001	32.447 0.836 0.010		Vel = 0.19	
454 to 436	17.6 17.59		0.0 2.14	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	33.293 0.004 0.001		Vel = 0.19	
436			0.0 2.14						33.298		K Factor = 0.37	
419 to 418	18.69 19.53		1.95 1.95	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	32.815 -0.364 0.001		Vel = 0.17	
418 to 402	19.53 17.6		0.0 1.95	2 2.157	E	6.153	159.500 6.153 165.653	120 0	32.452 0.836 0.008		Vel = 0.17	
402 to 403	17.6 17.59		0.0 1.95	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	33.296 0.004 0.001		Vel = 0.17	
403			0.0 1.95						33.301		K Factor = 0.34	
420 to 469	18.69 19.53		1.81 1.81	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	32.819 -0.364 0.001		Vel = 0.16	
469 to 404	19.53 17.59		0.0 1.81	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0	32.456 0.840 0.008		Vel = 0.16	
404			0.0 1.81						33.304		K Factor = 0.31	
421 to 470	18.69 19.53		1.72 1.72	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	32.823 -0.364 0.001		Vel = 0.15	
470 to 405	19.53 17.59		0.0 1.72	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0	32.460 0.840 0.008		Vel = 0.15	
405			0.0 1.72						33.308		K Factor = 0.30	
422 to 471	18.69 19.53		1.69 1.69	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	32.827 -0.364 0.001		Vel = 0.15	
471 to 406	19.53 17.59		0.0 1.69	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0	32.464 0.840 0.007		Vel = 0.15	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
406			0.0 1.69					33.311		K Factor = 0.29	
423 to 473	18.69 19.53		1.74 1.74	2 2.157	T	12.307 12.307 13.137	120 0.0001	32.830 -0.364 0.001		Vel = 0.15	
473 to 472	19.53 17.6		0.0 1.74	2 2.157	E	6.153 6.153 165.653	120 0	32.467 0.836 0.007		Vel = 0.15	
472 to 407	17.6 17.59		0.0 1.74	2.5 2.635	T	16.474 16.474 17.304	120 0.0001	33.310 0.004 0.001		Vel = 0.10	
407			0.0 1.74					33.315		K Factor = 0.30	
424 to 474	18.69 19.53		1.79 1.79	2 2.157	T	12.307 12.307 13.137	120 0	32.834 -0.364 0.0		Vel = 0.16	
474 to 408	19.53 17.59		0.0 1.79	2 2.157	E T	6.153 12.307 178.790	120 0	32.470 0.840 0.008		Vel = 0.16	
408			0.0 1.79					33.318		K Factor = 0.31	
425 to 475	18.69 19.53		1.91 1.91	2 2.157	T	12.307 12.307 13.137	120 0.0001	32.836 -0.364 0.001		Vel = 0.17	
475 to 409	19.53 17.59		0.0 1.91	2 2.157	E T	6.153 12.307 178.790	120 0.0001	32.473 0.840 0.009		Vel = 0.17	
409			0.0 1.91					33.322		K Factor = 0.33	
426 to 476	18.69 19.53		2.07 2.07	2 2.157	T	12.307 12.307 13.137	120 0.0001	32.838 -0.364 0.001		Vel = 0.18	
476 to 410	19.53 17.59		0.0 2.07	2 2.157	E T	6.153 12.307 178.790	120 0.0001	32.475 0.840 0.011		Vel = 0.18	
410			0.0 2.07					33.326		K Factor = 0.36	
427 to 477	18.69 19.53		2.27 2.27	2 2.157	T	12.307 12.307 13.137	120 0.0002	32.840 -0.364 0.002		Vel = 0.20	
477 to 411	19.53 17.59		0.0 2.27	2 2.157	E T	6.153 12.307 178.790	120 0.0001	32.478 0.840 0.012		Vel = 0.20	
411			0.0 2.27					33.330		K Factor = 0.39	
428 to 478	18.69 19.53		2.50 2.5	2 2.157	T	12.307 12.307 13.137	120 0.0002	32.842 -0.364 0.002		Vel = 0.22	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
478 to 412	19.53 17.59		0.0 2.5	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0001	32.480 0.840 0.014		Vel = 0.22	
412			0.0 2.50					33.334		K Factor = 0.43	
429 to 479	18.69 19.53		2.65 2.65	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0001	32.843 -0.364 0.001		Vel = 0.23	
479 to 492	19.53 18.78		0.0 2.65	2 2.157	E 6.153	62.000 6.153 68.153	120 0.0001	32.480 0.325 0.007		Vel = 0.23	
492 to 491	18.78 18.64		0.0 2.65	2 2.157		11.000 11.000	120 0	32.812 0.061 0.0		Vel = 0.23	
491 to 493	18.64 18.51		0.0 2.65	2 2.157		11.330 11.330	120 0.0001	32.873 0.056 0.001		Vel = 0.23	
493 to 494	18.51 18.36		0.0 2.65	2 2.157		12.000 12.000	120 0.0002	32.930 0.065 0.002		Vel = 0.23	
494 to 413	18.36 17.59		0.0 2.65	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0001	32.997 0.333 0.007		Vel = 0.23	
413			0.0 2.65					33.337		K Factor = 0.46	
430 to 480	18.69 19.53		2.90 2.9	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0001	32.844 -0.364 0.001		Vel = 0.25	
480 to 495	19.53 18.78		0.0 2.9	2 2.157	E 6.153	62.000 6.153 68.153	120 0.0001	32.481 0.325 0.008		Vel = 0.25	
495 to 496	18.78 18.64		0.0 2.9	2 2.157		11.000 11.000	120 0.0001	32.814 0.061 0.001		Vel = 0.25	
496 to 497	18.64 18.51		0.0 2.9	2 2.157		11.330 11.330	120 0.0001	32.876 0.056 0.001		Vel = 0.25	
497 to 498	18.51 18.36		0.0 2.9	2 2.157		12.000 12.000	120 0.0001	32.933 0.065 0.001		Vel = 0.25	
498 to 414	18.36 17.59		0.0 2.9	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0001	32.999 0.333 0.009		Vel = 0.25	
414			0.0 2.90					33.341		K Factor = 0.50	
431 to 481	18.69 19.53		3.18 3.18	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0002	32.844 -0.364 0.002		Vel = 0.28	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
481 to 499	19.53 18.36		0.0 3.18	2 2.157	E	6.153	96.330 6.153 102.483	120 0.0001	32.482 0.507 0.013		Vel = 0.28	
499 to 415	18.36 17.59		0.0 3.18	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0001	33.002 0.333 0.011		Vel = 0.28	
415			0.0 3.18						33.346		K Factor = 0.55	
432 to 482	18.69 19.53		4.71 4.71	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0003	32.845 -0.364 0.004		Vel = 0.41	
482 to 416	19.53 17.59		0.0 4.71	2 2.157	E	6.153	160.330 6.153 166.483	120 0.0003	32.485 0.840 0.044		Vel = 0.41	
416			0.0 4.71						33.369		K Factor = 0.82	
448 to 441	19.52 17.59		4.50 4.5	2.5 2.635	2T	32.948	160.340 32.948 193.288	120 0.0001	32.436 0.836 0.018		Vel = 0.26	
441			0.0 4.50						33.290		K Factor = 0.78	
447 to 442	19.52 17.59		4.42 4.42	2.5 2.635	2T	32.948	160.340 32.948 193.288	120 0.0001	32.437 0.836 0.017		Vel = 0.26	
442			0.0 4.42						33.290		K Factor = 0.77	
446 to 487	19.52 18.86		4.37 4.37	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0001	32.437 0.286 0.006		Vel = 0.26	
487 to 488	18.86 18.73		0.0 4.37	2.5 2.635			11.000 11.000	120 0.0001	32.729 0.056 0.001		Vel = 0.26	
488 to 489	18.73 18.63		0.0 4.37	2.5 2.635			8.500 8.500	120 0.0001	32.786 0.043 0.001		Vel = 0.26	
489 to 490	18.63 18.49		0.0 4.37	2.5 2.635			11.420 11.420	120 0.0001	32.830 0.061 0.001		Vel = 0.26	
490 to 443	18.49 17.59		0.0 4.37	2.5 2.635	T	16.474	74.680 16.474 91.154	120 0.0001	32.892 0.390 0.008		Vel = 0.26	
443			0.0 4.37						33.290		K Factor = 0.76	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GR SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

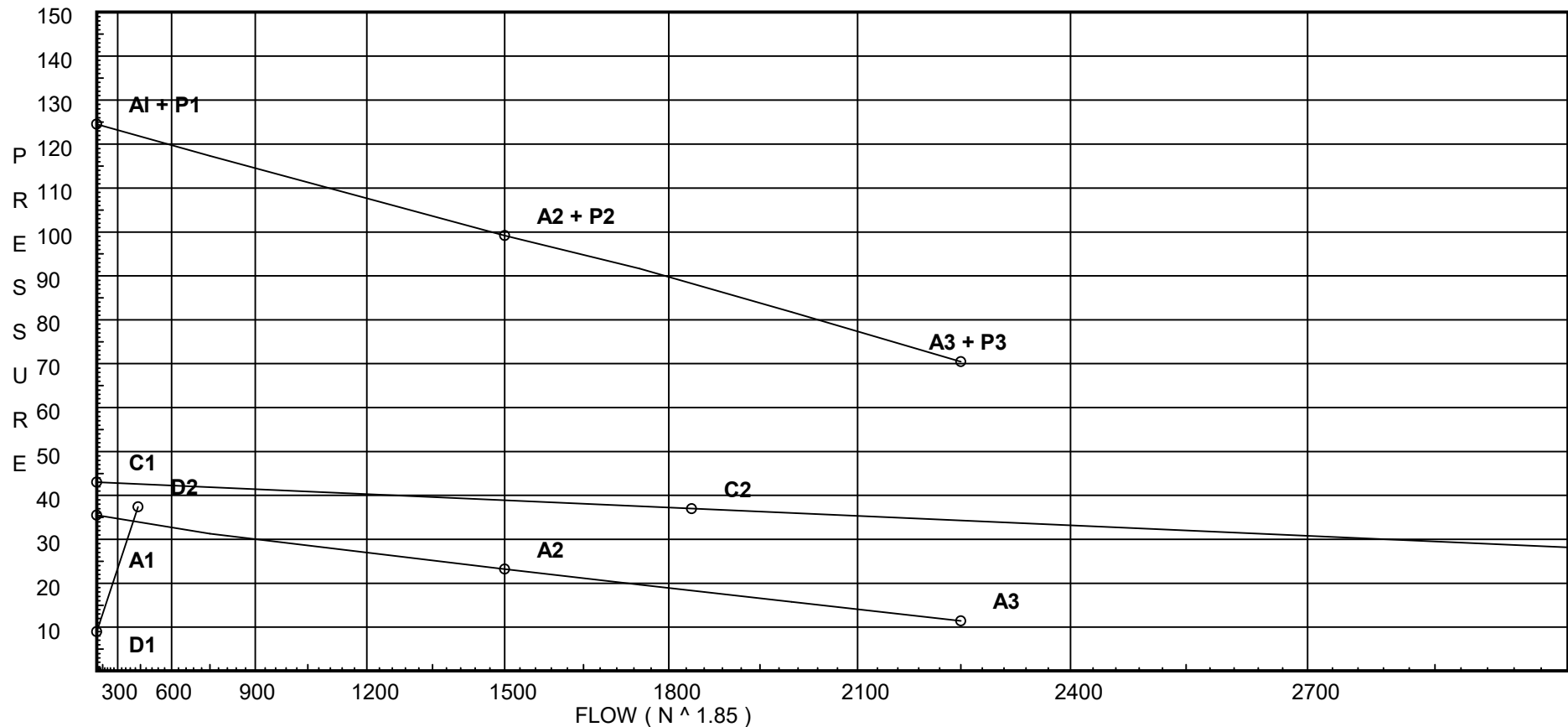
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 8.978
D2 - System Flow : 435.611
D2 - System Pressure : 37.391
Hose (Demand) :
D3 - System Demand : 435.611
Hose (Adj City) : 250
Safety Margin : 83.691



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			121.082	435.61	37.391
TEST	43.0	37	1839.0	42.033	685.61	42.033

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>	
500	18.73	11.2	18.0	47.52	0.01	130
501	18.83	11.2	18.13	47.69	0.01	130
468	19.53		22.4			
449	18.69		23.71			
448	19.52		23.39			
447	19.52		23.4			
446	19.52		23.4			
445	19.52		23.4			
484	18.86		23.75			
483	18.73		23.82			
485	18.63		23.87			
486	18.49		23.94			
444	17.59		24.41			
443	17.59		24.41			
442	17.59		24.42			
441	17.59		24.42			
440	17.59		24.42			
439	17.59		24.43			
438	17.59		24.45			
437	17.59		24.47			
436	17.59		24.48			
435	17.59		24.5			
403	17.59		24.51			
404	17.59		24.54			
405	17.59		24.57			
406	17.59		24.61			
407	17.59		24.64			
408	17.59		24.68			
409	17.59		24.72			
410	17.59		24.76			
411	17.59		24.8			
412	17.59		24.84			
413	17.59		24.87			
414	17.59		24.91			
415	17.59		24.96			
416	17.59		25.21			
417	17.41		25.51			
TR4	17.24		28.15			
BR4	2.83		34.73			
BR3	2.83		34.78			
127	2.792		36.04			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
128	2.0		36.51			
PO	1.08		37.39			
PI	1.08		33.18			
FLG	-5.0		36.05			
TEST	-2.0		42.03	250.0		
502	18.59	11.2	18.06	47.6	0.01	130
503	18.45	11.2	18.32	47.94	0.01	130
450	18.69		23.72			
451	18.69		23.76			
452	18.69		23.83			
419	18.69		23.88			
420	18.69		23.94			
421	18.69		23.98			
422	18.69		24.02			
423	18.69		24.06			
424	18.69		24.1			
425	18.69		24.12			
426	18.69		24.15			
427	18.69		24.17			
428	18.69		24.19			
429	18.69		24.2			
430	18.69		24.21			
431	18.69		24.22			
432	18.69		24.22			
433	18.69		24.22			
434	19.53		23.9			
467	19.53		22.41			
504	18.83	11.2	18.14	47.7	0.01	130
505	18.73	11.2	18.0	47.52	0.01	130
506	18.59	11.2	18.07	47.6	0.01	130
507	18.45	11.2	18.33	47.95	0.01	130
460	19.53		23.33			
508	18.45	11.2	23.33	54.1	0.01	130
459	17.6		24.33			
455	19.53		23.48			
454	17.6		24.46			
418	19.53		23.53			
402	17.6		24.49			
469	19.53		23.58			
470	19.53		23.63			
471	19.53		23.67			
473	19.53		23.71			
472	17.6		24.63			
474	19.53		23.74			
475	19.53		23.77			
476	19.53		23.8			
477	19.53		23.82			
478	19.53		23.84			
479	19.53		23.85			
492	18.78		24.24			
491	18.64		24.32			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
493	18.51		24.38		
494	18.36		24.46		
480	19.53		23.86		
495	18.78		24.27		
496	18.64		24.34		
497	18.51		24.41		
498	18.36		24.49		
481	19.53		23.87		
499	18.36		24.52		
482	19.53		23.89		
487	18.86		23.75		
488	18.73		23.82		
489	18.63		23.87		
490	18.49		23.94		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
500 to 501	18.73 18.83	11.20	49.11 49.11	2 2.157			8.500 8.500	120 0.0205	18.000 -0.043 0.174		Vel = 4.31	
501 to 468	18.83 19.53	11.20	47.69 96.8	2 2.157	E	6.153	57.490 6.153 63.643	120 0.0719	18.131 -0.303 4.575		Vel = 8.50	
468 to 449	19.53 18.69		0.0 96.8	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0719	22.403 0.364 0.944		Vel = 8.50	
449 to 448	18.69 19.52		-34.10 62.7	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0011	23.711 -0.359 0.040		Vel = 1.41	
448 to 447	19.52 19.52		-15.98 46.72	4 4.26			8.000 8.000	120 0.0008	23.392 0.0 0.006		Vel = 1.05	
447 to 446	19.52 19.52		-15.69 31.03	4 4.26			9.000 9.000	120 0.0003	23.398 0.0 0.003		Vel = 0.70	
446 to 445	19.52 19.52		-15.53 15.5	4 4.26			9.000 9.000	120 0.0001	23.401 0.0 0.001		Vel = 0.35	
445 to 484	19.52 18.86		0.0 15.5	2.5 2.635	T	16.474	54.740 16.474 71.214	120 0.0009	23.402 0.286 0.064		Vel = 0.91	
484 to 483	18.86 18.73		0.0 15.5	2.5 2.635			11.000 11.000	120 0.0010	23.752 0.056 0.011		Vel = 0.91	
483 to 485	18.73 18.63		0.0 15.5	2.5 2.635			8.500 8.500	120 0.0009	23.819 0.043 0.008		Vel = 0.91	
485 to 486	18.63 18.49		0.0 15.5	2.5 2.635			11.420 11.420	120 0.0009	23.870 0.061 0.010		Vel = 0.91	
486 to 444	18.49 17.59		0.0 15.5	2.5 2.635	T	16.474	74.680 16.474 91.154	120 0.0009	23.941 0.390 0.083		Vel = 0.91	
444 to 443	17.59 17.59		0.0 15.5	6 6.357			9.000 9.000	120 0	24.414 0.0 0.0		Vel = 0.16	
443 to 442	17.59 17.59		15.53 31.03	6 6.357			9.000 9.000	120 0.0001	24.414 0.0 0.001		Vel = 0.31	
442 to 441	17.59 17.59		15.69 46.72	6 6.357			8.000 8.000	120 0.0001	24.415 0.0 0.001		Vel = 0.47	
441 to 440	17.59 17.59		15.98 62.7	6 6.357			8.000 8.000	120 0.0001	24.416 0.0 0.001		Vel = 0.63	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
440 to 439	17.59 17.590		93.95 156.65	6 6.357		10.500 10.500	120 0.0009	24.417 0.0 0.009		Vel = 1.58	
439 to 438	17.590 17.59		93.99 250.64	6 6.357		10.500 10.500	120 0.0022	24.426 0.0 0.023		Vel = 2.53	
438 to 437	17.59 17.59		31.24 281.88	6 6.357		9.250 9.250	120 0.0027	24.449 0.0 0.025		Vel = 2.85	
437 to 436	17.59 17.59		0.0 281.88	6 6.357		1.250 1.250	120 0.0024	24.474 0.0 0.003		Vel = 2.85	
436 to 435	17.59 17.59		9.09 290.97	6 6.357		8.000 8.000	120 0.0029	24.477 0.0 0.023		Vel = 2.94	
435 to 403	17.59 17.59		0.0 290.97	6 6.357		2.500 2.500	120 0.0028	24.500 0.0 0.007		Vel = 2.94	
403 to 404	17.59 17.59		8.27 299.24	6 6.357		10.500 10.500	120 0.0030	24.507 0.0 0.032		Vel = 3.02	
404 to 405	17.59 17.59		7.64 306.88	6 6.357		10.500 10.500	120 0.0031	24.539 0.0 0.033		Vel = 3.10	
405 to 406	17.59 17.59		7.18 314.06	6 6.357		10.500 10.500	120 0.0032	24.572 0.0 0.034		Vel = 3.17	
406 to 407	17.59 17.59		6.92 320.98	6 6.357		10.500 10.500	120 0.0034	24.606 0.0 0.036		Vel = 3.24	
407 to 408	17.59 17.59		7.00 327.98	6 6.357		10.500 10.500	120 0.0036	24.642 0.0 0.038		Vel = 3.32	
408 to 409	17.59 17.59		7.00 334.98	6 6.357		10.500 10.500	120 0.0036	24.680 0.0 0.038		Vel = 3.39	
409 to 410	17.59 17.59		7.33 342.31	6 6.357		10.500 10.500	120 0.0039	24.718 0.0 0.041		Vel = 3.46	
410 to 411	17.59 17.59		7.82 350.13	6 6.357		10.500 10.500	120 0.0040	24.759 0.0 0.042		Vel = 3.54	
411 to 412	17.59 17.59		8.45 358.58	6 6.357		10.500 10.500	120 0.0042	24.801 0.0 0.044		Vel = 3.62	
412 to 413	17.59 17.59		9.21 367.79	6 6.357		6.170 6.170	120 0.0044	24.845 0.0 0.027		Vel = 3.72	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
413 to 414	17.59 17.59		9.72 377.51	6 6.357		9.000 9.000	120 0.0047	24.872 0.0 0.042		Vel = 3.82	
414 to 415	17.59 17.59		10.56 388.07	6 6.357		10.000 10.000	120 0.0048	24.914 0.0 0.048		Vel = 3.92	
415 to 416	17.59 17.59		11.55 399.62	6 6.357	T 37.72	10.000 37.720 47.720	120 0.0051	24.962 0.0 0.245		Vel = 4.04	
416 to 417	17.59 17.41		16.89 416.51	6 6.357	E 17.603	23.300 17.603 40.903	120 0.0055	25.207 0.078 0.226		Vel = 4.21	
417 to TR4	17.41 17.24		19.10 435.61	6 6.357	6E 105.616	320.930 105.616 426.546	120 0.0060	25.511 0.074 2.565		Vel = 4.40	
TR4 to BR4	17.24 2.83		0.0 435.61	6 6.357	T 37.72 G 3.772	14.410 41.492 55.902	120 0.0060	28.150 6.241 0.336		Vel = 4.40	
BR4 to BR3	2.83 2.83		0.0 435.61	4 4.26		1.250 1.250	120 0.0424	34.727 0.0 0.053		Vel = 9.81	
BR3 to 127	2.83 2.792		0.0 435.61	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0423	34.780 0.016 1.247		Vel = 9.81	
127 to 128	2.792 2		0.0 435.61	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0060	36.043 0.343 0.120		Vel = 4.40	
128 to PO	2 1.080		0.0 435.61	8 8.249	7E 147.988 T 41.108 B 14.094 S 52.853	31.833 256.043 287.876	120 0.0017	36.506 0.398 0.487		Vel = 2.62	
PO			0.0 435.61					37.391		K Factor = 71.24	
System Demand Pressure								37.391			
Safety Margin								83.691			
Continuation Pressure								121.082			
Pressure @ Pump Outlet								121.082			
Pressure From Pump Curve								-87.902			
Pressure @ Pump Inlet								33.180			
PI to FLG	1.080 -5		0.0 435.61	8 8.249	5E 105.706 G 4.698	28.750 110.404 139.154	120 0.0017	33.180 2.633 0.236		Vel = 2.62	
FLG to TEST	-5 -2		0.0 435.61	8 8.27	Zfh 0.0 2E 56.936	169.140 56.936 226.076	140 0.0013	36.049 5.701 0.283		* * Fixed Loss = 7 Vel = 2.60	
TEST			250.00 685.61					42.033		Qa = 250.00 K Factor = 105.75	
500 to 502	18.73 18.59		-1.59 -1.59	2 2.157		11.500 11.500	120 -0.0001	18.000 0.061 -0.001		Vel = 0.14	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
502 to 503	18.59 18.45	11.20	47.60 46.01	2 2.157		11.000 11.000	120 0.0182	18.060 0.061 0.200		Vel = 4.04	
503 to 440	18.45 17.59	11.20	47.94 93.95	2 2.157	T 12.307	71.840 12.307 84.147	120 0.0680	18.321 0.372 5.724		Vel = 8.25	
440			0.0 93.95					24.417		K Factor = 19.01	
449 to 450	18.69 18.69		34.09 34.09	4 4.26		10.500 10.500	120 0.0004	23.711 0.0 0.004		Vel = 0.77	
450 to 451	18.69 18.69		96.79 130.88	4 4.26		10.500 10.500	120 0.0046	23.715 0.0 0.048		Vel = 2.95	
451 to 452	18.69 18.69		22.86 153.74	4 4.26		10.500 10.500	120 0.0061	23.763 0.0 0.064		Vel = 3.46	
452 to 419	18.69 18.69		-9.10 144.64	4 4.26		10.500 10.500	120 0.0055	23.827 0.0 0.058		Vel = 3.26	
419 to 420	18.69 18.69		-8.27 136.37	4 4.26		10.500 10.500	120 0.0050	23.885 0.0 0.052		Vel = 3.07	
420 to 421	18.69 18.69		-7.64 128.73	4 4.26		10.500 10.500	120 0.0044	23.937 0.0 0.046		Vel = 2.90	
421 to 422	18.69 18.69		-7.18 121.55	4 4.26		10.500 10.500	120 0.0040	23.983 0.0 0.042		Vel = 2.74	
422 to 423	18.69 18.69		-6.92 114.63	4 4.26		10.500 10.500	120 0.0035	24.025 0.0 0.037		Vel = 2.58	
423 to 424	18.69 18.69		-7.00 107.63	4 4.26		10.500 10.500	120 0.0032	24.062 0.0 0.034		Vel = 2.42	
424 to 425	18.69 18.69		-7.00 100.63	4 4.26		10.500 10.500	120 0.0028	24.096 0.0 0.029		Vel = 2.27	
425 to 426	18.69 18.69		-7.33 93.3	4 4.26		10.500 10.500	120 0.0025	24.125 0.0 0.026		Vel = 2.10	
426 to 427	18.69 18.69		-7.82 85.48	4 4.26		10.500 10.500	120 0.0021	24.151 0.0 0.022		Vel = 1.92	
427 to 428	18.69 18.69		-8.45 77.03	4 4.26		10.500 10.500	120 0.0017	24.173 0.0 0.018		Vel = 1.73	
428 to 429	18.69 18.69		-9.21 67.82	4 4.26		6.170 6.170	120 0.0013	24.191 0.0 0.008		Vel = 1.53	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
429 to 430	18.69 18.69		-9.72 58.1	4 4.26			9.000 9.000	120 0.0010	24.199 0.0 0.009		Vel = 1.31	
430 to 431	18.69 18.69		-10.56 47.54	4 4.26			10.000 10.000	120 0.0007	24.208 0.0 0.007		Vel = 1.07	
431 to 432	18.69 18.69		-11.55 35.99	4 4.26			10.000 10.000	120 0.0005	24.215 0.0 0.005		Vel = 0.81	
432 to 433	18.69 18.69		-16.89 19.1	4 4.26			9.000 9.000	120 0.0001	24.220 0.0 0.001		Vel = 0.43	
433 to 434	18.69 19.53		0.0 19.1	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0036	24.221 -0.364 0.047		Vel = 1.68	
434 to 417	19.53 17.41		0.0 19.1	2 2.157	E T	6.153 12.307	174.640 18.460 193.100	120 0.0036	23.904 0.918 0.689		Vel = 1.68	
417			0.0 19.10						25.511		K Factor = 3.78	
450 to 467	18.69 19.53		-96.79 -96.79	2 2.157	T	12.307	0.830 12.307 13.137	120 -0.0719	23.715 -0.364 -0.944		Vel = 8.50	
467 to 504	19.53 18.83		0.0 -96.79	2 2.157	E	6.153	57.490 6.153 63.643	120 -0.0719	22.407 0.303 -4.574		Vel = 8.50	
504 to 505	18.83 18.73	11.20	47.70 -49.09	2 2.157			8.500 8.500	120 -0.0205	18.136 0.043 -0.174		Vel = 4.31	
505 to 506	18.73 18.59	11.20	47.53 -1.56	2 2.157			11.500 11.500	120 -0.0001	18.005 0.061 -0.001		Vel = 0.14	
506 to 507	18.59 18.45	11.20	47.60 46.04	2 2.157			11.000 11.000	120 0.0182	18.065 0.061 0.200		Vel = 4.04	
507 to 439	18.45 17.590	11.20	47.94 93.98	2 2.157	T	12.307	71.840 12.307 84.147	120 0.0681	18.326 0.372 5.728		Vel = 8.25	
439			0.0 93.98						24.426		K Factor = 19.02	
451 to 460	18.69 19.53		-22.86 -22.86	2 2.157	T	12.307	0.830 12.307 13.137	120 -0.0049	23.763 -0.364 -0.065		Vel = 2.01	
460 to 508	19.53 18.45		0.0 -22.86	2 2.157	E	6.153	88.490 6.153 94.643	120 -0.0050	23.334 0.468 -0.472		Vel = 2.01	
508 to 459	18.45 17.6	11.20	54.10 31.24	2 2.157			71.010 71.010	120 0.0089	23.330 0.368 0.630		Vel = 2.74	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
459 to 438	17.6 17.59		0.0 31.24	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0089	24.328 0.004 0.117		Vel = 2.74	
438			0.0 31.24						24.449		K Factor = 6.32	
452 to 455	18.69 19.53		9.09 9.09	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0009	23.827 -0.364 0.012		Vel = 0.80	
455 to 454	19.53 17.6		0.0 9.09	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0009	23.475 0.836 0.150		Vel = 0.80	
454 to 436	17.6 17.59		0.0 9.09	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0009	24.461 0.004 0.012		Vel = 0.80	
436			0.0 9.09						24.477		K Factor = 1.84	
419 to 418	18.69 19.53		8.28 8.28	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0008	23.885 -0.364 0.010		Vel = 0.73	
418 to 402	19.53 17.6		0.0 8.28	2 2.157	E	6.153	159.500 6.153 165.653	120 0.0008	23.531 0.836 0.126		Vel = 0.73	
402 to 403	17.6 17.59		0.0 8.28	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0008	24.493 0.004 0.010		Vel = 0.73	
403			0.0 8.28						24.507		K Factor = 1.67	
420 to 469	18.69 19.53		7.64 7.64	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0007	23.937 -0.364 0.009		Vel = 0.67	
469 to 404	19.53 17.59		0.0 7.64	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0007	23.582 0.840 0.117		Vel = 0.67	
404			0.0 7.64						24.539		K Factor = 1.54	
421 to 470	18.69 19.53		7.18 7.18	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0006	23.983 -0.364 0.008		Vel = 0.63	
470 to 405	19.53 17.59		0.0 7.18	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0006	23.627 0.840 0.105		Vel = 0.63	
405			0.0 7.18						24.572		K Factor = 1.45	
422 to 471	18.69 19.53		6.92 6.92	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0005	24.025 -0.364 0.007		Vel = 0.61	
471 to 406	19.53 17.59		0.0 6.92	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0005	23.668 0.840 0.098		Vel = 0.61	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
406			0.0 6.92					24.606		K Factor = 1.40	
423 to 473	18.69 19.53		7.00 7.0	2 2.157	T 6.153	12.307 12.307 13.137	120 0.0006	24.062 -0.364 0.008		Vel = 0.61	
473 to 472	19.53 17.6		0.0 7.0	2 2.157	E 6.153	159.500 6.153 165.653	120 0.0006	23.706 0.836 0.092		Vel = 0.61	
472 to 407	17.6 17.59		0.0 7.0	2.5 2.635	T 6.153	16.474 16.474 17.304	120 0.0002	24.634 0.004 0.004		Vel = 0.41	
407			0.0 7.00					24.642		K Factor = 1.41	
424 to 474	18.69 19.53		7.00 7.0	2 2.157	T 6.153	12.307 12.307 13.137	120 0.0006	24.096 -0.364 0.008		Vel = 0.61	
474 to 408	19.53 17.59		0.0 7.0	2 2.157	E T 6.153	160.330 12.307 18.460 178.790	120 0.0006	23.740 0.840 0.100		Vel = 0.61	
408			0.0 7.00					24.680		K Factor = 1.41	
425 to 475	18.69 19.53		7.33 7.33	2 2.157	T 6.153	12.307 12.307 13.137	120 0.0007	24.125 -0.364 0.009		Vel = 0.64	
475 to 409	19.53 17.59		0.0 7.33	2 2.157	E T 6.153	160.330 12.307 18.460 178.790	120 0.0006	23.770 0.840 0.108		Vel = 0.64	
409			0.0 7.33					24.718		K Factor = 1.47	
426 to 476	18.69 19.53		7.82 7.82	2 2.157	T 6.153	12.307 12.307 13.137	120 0.0007	24.151 -0.364 0.009		Vel = 0.69	
476 to 410	19.53 17.59		0.0 7.82	2 2.157	E T 6.153	160.330 12.307 18.460 178.790	120 0.0007	23.796 0.840 0.123		Vel = 0.69	
410			0.0 7.82					24.759		K Factor = 1.57	
427 to 477	18.69 19.53		8.45 8.45	2 2.157	T 6.153	12.307 12.307 13.137	120 0.0008	24.173 -0.364 0.010		Vel = 0.74	
477 to 411	19.53 17.59		0.0 8.45	2 2.157	E T 6.153	160.330 12.307 18.460 178.790	120 0.0008	23.819 0.840 0.142		Vel = 0.74	
411			0.0 8.45					24.801		K Factor = 1.70	
428 to 478	18.69 19.53		9.21 9.21	2 2.157	T 6.153	12.307 12.307 13.137	120 0.0009	24.191 -0.364 0.012		Vel = 0.81	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
478 to 412	19.53 17.59		0.0 9.21	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0009	23.839 0.840 0.166		Vel = 0.81	
412			0.0 9.21					24.845		K Factor = 1.85	
429 to 479	18.69 19.53		9.72 9.72	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0011	24.199 -0.364 0.014		Vel = 0.85	
479 to 492	19.53 18.78		0.0 9.72	2 2.157	E 6.153	62.000 6.153 68.153	120 0.0010	23.849 0.325 0.069		Vel = 0.85	
492 to 491	18.78 18.64		0.0 9.72	2 2.157		11.000 11.000	120 0.0010	24.243 0.061 0.011		Vel = 0.85	
491 to 493	18.64 18.51		0.0 9.72	2 2.157		11.330 11.330	120 0.0011	24.315 0.056 0.012		Vel = 0.85	
493 to 494	18.51 18.36		0.0 9.72	2 2.157		12.000 12.000	120 0.0010	24.383 0.065 0.012		Vel = 0.85	
494 to 413	18.36 17.59		0.0 9.72	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0010	24.460 0.333 0.079		Vel = 0.85	
413			0.0 9.72					24.872		K Factor = 1.95	
430 to 480	18.69 19.53		10.56 10.56	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0012	24.208 -0.364 0.016		Vel = 0.93	
480 to 495	19.53 18.78		0.0 10.56	2 2.157	E 6.153	62.000 6.153 68.153	120 0.0012	23.860 0.325 0.081		Vel = 0.93	
495 to 496	18.78 18.64		0.0 10.56	2 2.157		11.000 11.000	120 0.0012	24.266 0.061 0.013		Vel = 0.93	
496 to 497	18.64 18.51		0.0 10.56	2 2.157		11.330 11.330	120 0.0012	24.340 0.056 0.014		Vel = 0.93	
497 to 498	18.51 18.36		0.0 10.56	2 2.157		12.000 12.000	120 0.0012	24.410 0.065 0.014		Vel = 0.93	
498 to 414	18.36 17.59		0.0 10.56	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0012	24.489 0.333 0.092		Vel = 0.93	
414			0.0 10.56					24.914		K Factor = 2.12	
431 to 481	18.69 19.53		11.55 11.55	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0014	24.215 -0.364 0.019		Vel = 1.01	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
481 to 499	19.53 18.36		0.0 11.55	2 2.157	E	6.153 102.483	120 0.0014	23.870 0.507 0.144		Vel = 1.01	
499 to 415	18.36 17.59		0.0 11.55	2 2.157	T	12.307 76.307	120 0.0014	24.521 0.333 0.108		Vel = 1.01	
415			0.0 11.55					24.962		K Factor = 2.31	
432 to 482	18.69 19.53		16.89 16.89	2 2.157	T	12.307 13.137	120 0.0028	24.220 -0.364 0.037		Vel = 1.48	
482 to 416	19.53 17.59		0.0 16.89	2 2.157	E	6.153 166.483	120 0.0028	23.893 0.840 0.474		Vel = 1.48	
416			0.0 16.89					25.207		K Factor = 3.36	
448 to 441	19.52 17.59		15.98 15.98	2.5 2.635	2T	32.948 193.288	120 0.0010	23.392 0.836 0.188		Vel = 0.94	
441			0.0 15.98					24.416		K Factor = 3.23	
447 to 442	19.52 17.59		15.69 15.69	2.5 2.635	2T	32.948 193.288	120 0.0009	23.398 0.836 0.181		Vel = 0.92	
442			0.0 15.69					24.415		K Factor = 3.18	
446 to 487	19.52 18.86		15.54 15.54	2.5 2.635	T	16.474 71.214	120 0.0009	23.401 0.286 0.065		Vel = 0.91	
487 to 488	18.86 18.73		0.0 15.54	2.5 2.635		11.000 11.000	120 0.0009	23.752 0.056 0.010		Vel = 0.91	
488 to 489	18.73 18.63		0.0 15.54	2.5 2.635		8.500 8.500	120 0.0011	23.818 0.043 0.009		Vel = 0.91	
489 to 490	18.63 18.49		0.0 15.54	2.5 2.635		11.420 11.420	120 0.0009	23.870 0.061 0.010		Vel = 0.91	
490 to 443	18.49 17.59		0.0 15.54	2.5 2.635	T	16.474 91.154	120 0.0009	23.941 0.390 0.083		Vel = 0.91	
443			0.0 15.54					24.414		K Factor = 3.15	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
503	440	71.840	501	468	57.490
507	439	71.840	467	504	57.490
508	459	71.010	460	508	88.490

Flow		Safety		Pressure
Required		Margin		Differential
Left	12.000	685.675	83.733	-0.042
Area Calculated		685.611	83.691	0.000
Right	12.000	685.371	83.829	-0.138

Typical Distance Between Heads = 12.000

Split Point Used in Worst Area Peaked = 500



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GR STOCK 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

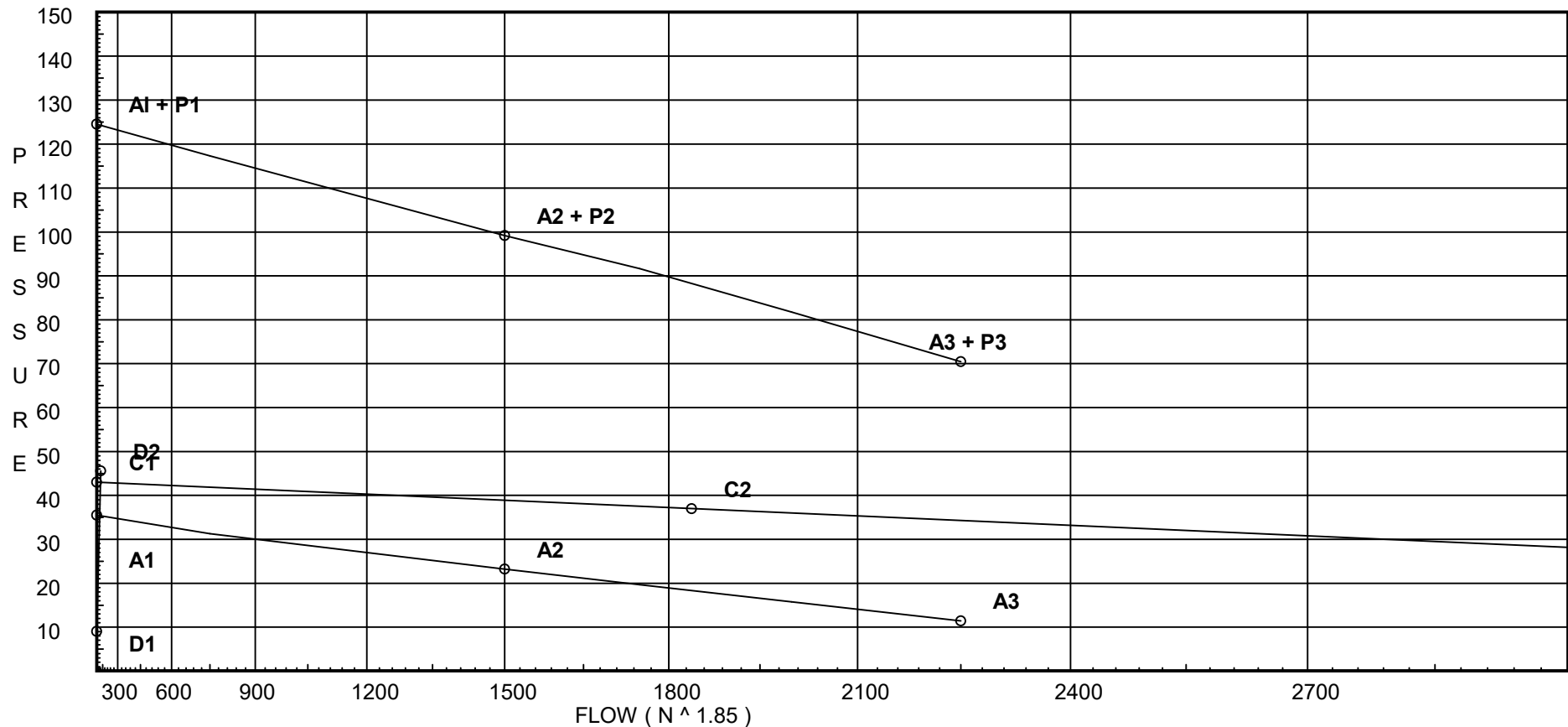
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.069
D2 - System Flow : 122.738
D2 - System Pressure : 45.609
Hose (Demand) :
D3 - System Demand : 122.738
Hose (Adj City) : 250
Safety Margin : 78.282



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.891	122.74	45.609
TEST	43.0	37	1839.0	42.687	372.74	42.687

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>	
SP04	19.25	11.2	30.0	61.34	0.01	130
EQ04	18.5		36.28			
SP02	19.55	11.2	30.0	61.34	0.01	130
EQ02	18.8		36.28			
SP03	19.4	11.2	30.0	61.34	0.01	130
EQ03	18.65		36.28			
SP01	19.69	11.2	30.0	61.34	0.01	130
EQ01	18.94		36.28			
483	18.8	10.19	36.33	61.39	K=K @ EQ02	
484	18.94	10.19	36.28	61.34	K=K @ EQ01	
445	19.52		36.99			
446	19.52		37.0			
447	19.52		37.01			
448	19.52		37.02			
449	18.69		37.4			
450	18.69		37.41			
451	18.69		37.41			
452	18.69		37.42			
419	18.69		37.42			
420	18.69		37.43			
421	18.69		37.43			
422	18.69		37.43			
423	18.69		37.44			
424	18.69		37.44			
425	18.69		37.44			
426	18.69		37.44			
427	18.69		37.45			
428	18.69		37.45			
429	18.69		37.45			
430	18.69		37.45			
431	18.69		37.45			
432	18.69		37.45			
433	18.69		37.45			
434	19.53		37.09			
417	17.41		38.08			
TR4	17.24		38.4			
BR4	2.83		44.67			
BR3	2.83		44.67			
127	2.792		44.81			
128	2.0		45.16			
PO	1.08		45.61			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
PI	1.08		35.0		
FLG	-5.0		37.65		
TEST	-2.0		42.69	250.0	
485	18.65		36.51		
486	18.5		36.68		
444	17.59		37.89		
443	17.59		37.89		
442	17.59		37.89		
441	17.59		37.89		
440	17.59		37.9		
439	17.59		37.9		
454	17.59		37.9		
438	17.59		37.9		
453	17.59		37.9		
437	17.59		37.9		
436	17.59		37.9		
435	17.59		37.91		
403	17.59		37.91		
404	17.59		37.91		
405	17.59		37.91		
406	17.59		37.92		
407	17.59		37.92		
408	17.59		37.92		
409	17.59		37.93		
410	17.59		37.93		
411	17.59		37.94		
412	17.59		37.94		
413	17.59		37.94		
414	17.59		37.95		
415	17.59		37.95		
416	17.59		37.98		
487	18.94		37.27		
488	18.8		37.33		
489	18.65		37.4		
490	18.5		37.47		
468	19.53		37.04		
501	18.83		37.35		
500	18.73		37.39		
502	18.59		37.45		
503	18.45		37.52		
467	19.53		37.04		
504	18.83		37.35		
505	18.73		37.4		
506	18.59		37.46		
507	18.45		37.52		
457	17.6		37.89		
460	19.53		37.05		
508	18.45		37.52		
512	17.6		37.9		
455	19.53		37.05		
459	17.6		37.9		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
418	19.53		37.06		
402	17.6		37.9		
469	19.53		37.06		
470	19.53		37.07		
471	19.53		37.07		
473	19.53		37.07		
472	17.6		37.92		
474	19.53		37.08		
475	19.53		37.08		
476	19.53		37.08		
477	19.53		37.08		
478	19.53		37.09		
479	19.53		37.09		
492	18.78		37.42		
491	18.64		37.48		
493	18.51		37.54		
494	18.36		37.6		
480	19.53		37.09		
495	18.78		37.42		
496	18.64		37.48		
497	18.51		37.54		
498	18.36		37.61		
481	19.53		37.09		
499	18.36		37.61		
482	19.53		37.09		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
SP04 to EQ04	19.25 18.5	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950		Vel = 22.77	
EQ04			0.0 61.34					36.275		K Factor = 10.18	
SP02 to EQ02	19.55 18.8	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950		Vel = 22.77	
EQ02			0.0 61.34					36.275		K Factor = 10.18	
SP03 to EQ03	19.4 18.65	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950		Vel = 22.77	
EQ03			0.0 61.34					36.275		K Factor = 10.18	
SP01 to EQ01	19.69 18.94	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950		Vel = 22.77	
EQ01			0.0 61.34					36.275		K Factor = 10.18	
483 to 484	18.8 18.94	10.19	8.64 8.64	2.5 2.635		11.500 11.500	120 0.0003	36.332 -0.061 0.004		K = K @ EQ02 Vel = 0.51	
484 to 445	18.94 19.52	10.19	61.35 69.99	2.5 2.635	T 16.474	48.160 16.474 64.634	120 0.0149	36.275 -0.251 0.962		K = K @ EQ01 Vel = 4.12	
445 to 446	19.52 19.52		0.0 69.99	4 4.26		9.000 9.000	120 0.0014	36.986 0.0 0.013		Vel = 1.58	
446 to 447	19.52 19.52		-8.33 61.66	4 4.26		9.000 9.000	120 0.0011	36.999 0.0 0.010		Vel = 1.39	
447 to 448	19.52 19.52		-7.60 54.06	4 4.26		8.000 8.000	120 0.0009	37.009 0.0 0.007		Vel = 1.22	
448 to 449	19.52 18.69		-7.10 46.96	4 4.26	2E 26.334	8.830 26.334 35.164	120 0.0007	37.016 0.359 0.025		Vel = 1.06	
449 to 450	18.69 18.69		-2.80 44.16	4 4.26		10.500 10.500	120 0.0006	37.400 0.0 0.006		Vel = 0.99	
450 to 451	18.69 18.69		-2.48 41.68	4 4.26		10.500 10.500	120 0.0006	37.406 0.0 0.006		Vel = 0.94	
451 to 452	18.69 18.69		-2.23 39.45	4 4.26		10.500 10.500	120 0.0005	37.412 0.0 0.005		Vel = 0.89	
452 to 419	18.69 18.69		-2.00 37.45	4 4.26		10.500 10.500	120 0.0005	37.417 0.0 0.005		Vel = 0.84	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
419 to 420	18.69 18.69		-1.83 35.62	4 4.26			10.500 10.500	120 0.0004	37.422 0.0 0.004		Vel = 0.80	
420 to 421	18.69 18.69		-1.70 33.92	4 4.26			10.500 10.500	120 0.0004	37.426 0.0 0.004		Vel = 0.76	
421 to 422	18.69 18.69		-1.62 32.3	4 4.26			10.500 10.500	120 0.0004	37.430 0.0 0.004		Vel = 0.73	
422 to 423	18.69 18.69		-1.61 30.69	4 4.26			10.500 10.500	120 0.0003	37.434 0.0 0.003		Vel = 0.69	
423 to 424	18.69 18.69		-1.67 29.02	4 4.26			10.500 10.500	120 0.0003	37.437 0.0 0.003		Vel = 0.65	
424 to 425	18.69 18.69		-1.73 27.29	4 4.26			10.500 10.500	120 0.0003	37.440 0.0 0.003		Vel = 0.61	
425 to 426	18.69 18.69		-1.86 25.43	4 4.26			10.500 10.500	120 0.0002	37.443 0.0 0.002		Vel = 0.57	
426 to 427	18.69 18.69		-2.04 23.39	4 4.26			10.500 10.500	120 0.0002	37.445 0.0 0.002		Vel = 0.53	
427 to 428	18.69 18.69		-2.23 21.16	4 4.26			10.500 10.500	120 0.0002	37.447 0.0 0.002		Vel = 0.48	
428 to 429	18.69 18.69		-2.48 18.68	4 4.26			6.170 6.170	120 0	37.449 0.0 0.0		Vel = 0.42	
429 to 430	18.69 18.69		-2.62 16.06	4 4.26			9.000 9.000	120 0.0001	37.449 0.0 0.001		Vel = 0.36	
430 to 431	18.69 18.69		-2.87 13.19	4 4.26			10.000 10.000	120 0.0001	37.450 0.0 0.001		Vel = 0.30	
431 to 432	18.69 18.69		-3.17 10.02	4 4.26			10.000 10.000	120 0	37.451 0.0 0.0		Vel = 0.23	
432 to 433	18.69 18.69		-4.69 5.33	4 4.26			9.000 9.000	120 0	37.451 0.0 0.0		Vel = 0.12	
433 to 434	18.69 19.53		0.0 5.33	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0004	37.451 -0.364 0.005		Vel = 0.47	
434 to 417	19.53 17.41		0.0 5.33	2 2.157	E T	6.153 12.307	174.640 18.460 193.100	120 0.0003	37.092 0.918 0.065		Vel = 0.47	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
417 to TR4	17.41 17.24		117.41 122.74	6 6.357	6E	105.616	320.930 105.616 426.546	120 0.0006	38.075 0.074 0.246			
TR4 to BR4	17.24 2.83		0.0 122.74	6 6.357	T G	37.72 3.772	14.410 41.492 55.902	120 0.0006	38.395 6.241 0.032		Vel = 1.24	
BR4 to BR3	2.83 2.83		0.0 122.74	4 4.26			1.250 1.250	120 0.0040	44.668 0.0 0.005		Vel = 2.76	
BR3 to 127	2.83 2.792		0.0 122.74	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0041	44.673 0.016 0.121		Vel = 2.76	
127 to 128	2.792 2		0.0 122.74	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0006	44.810 0.343 0.011		Vel = 1.24	
128 to PO	2 1.080		0.0 122.74	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0002	45.164 0.398 0.047		Vel = 0.74	
PO			0.0 122.74						45.609		K Factor = 18.17	
System Demand Pressure									45.609			
Safety Margin									78.282			
Continuation Pressure									123.891			
Pressure @ Pump Outlet									123.891			
Pressure From Pump Curve									-88.894			
Pressure @ Pump Inlet									34.997			
PI to FLG	1.080 -5		0.0 122.74	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0002	34.997 2.633 0.022		Vel = 0.74	
FLG to TEST	-5 -2		0.0 122.74	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0001	37.652 5.008 0.027		** Fixed Loss = 6.307 Vel = 0.73	
TEST			250.00 372.74						42.687		Qa = 250.00 K Factor = 57.05	
483 to 485	18.8 18.65		52.75 52.75	2.5 2.635			13.000 13.000	120 0.0088	36.332 0.065 0.115		Vel = 3.10	
485 to 486	18.65 18.5		0.0 52.75	2.5 2.635			12.000 12.000	120 0.0088	36.512 0.065 0.106		Vel = 3.10	
486 to 444	18.5 17.59		0.0 52.75	2.5 2.635	T	16.474	75.680 16.474 92.154	120 0.0088	36.683 0.394 0.813		Vel = 3.10	
444 to 443	17.59 17.59		0.0 52.75	6 6.357			9.000 9.000	120 0.0001	37.890 0.0 0.001		Vel = 0.53	
443 to 442	17.59 17.59		8.33 61.08	6 6.357			9.000 9.000	120 0.0001	37.891 0.0 0.001		Vel = 0.62	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
442 to 441	17.59 17.59		7.60 68.68	6 6.357		8.000 8.000	120 0.0002	37.892 0.0 0.002		Vel = 0.69	
441 to 440	17.59 17.59		7.10 75.78	6 6.357		8.000 8.000	120 0.0002	37.894 0.0 0.002		Vel = 0.77	
440 to 439	17.59 17.59		2.79 78.57	6 6.357		10.500 10.500	120 0.0002	37.896 0.0 0.002		Vel = 0.79	
439 to 454	17.59 17.59		2.49 81.06	6 6.357		6.500 6.500	120 0.0003	37.898 0.0 0.002		Vel = 0.82	
454 to 438	17.59 17.59		0.0 81.06	6 6.357		4.000 4.000	120 0.0002	37.900 0.0 0.001		Vel = 0.82	
438 to 453	17.59 17.59		2.22 83.28	6 6.357		2.000 2.000	120 0.0005	37.901 0.0 0.001		Vel = 0.84	
453 to 437	17.59 17.59		0.0 83.28	6 6.357		7.250 7.250	120 0.0003	37.902 0.0 0.002		Vel = 0.84	
437 to 436	17.59 17.59		0.0 83.28	6 6.357		1.250 1.250	120 0	37.904 0.0 0.0		Vel = 0.84	
436 to 435	17.59 17.59		2.01 85.29	6 6.357		8.000 8.000	120 0.0002	37.904 0.0 0.002		Vel = 0.86	
435 to 403	17.59 17.59		0.0 85.29	6 6.357		2.500 2.500	120 0.0004	37.906 0.0 0.001		Vel = 0.86	
403 to 404	17.59 17.59		1.82 87.11	6 6.357		10.500 10.500	120 0.0003	37.907 0.0 0.003		Vel = 0.88	
404 to 405	17.59 17.59		1.70 88.81	6 6.357		10.500 10.500	120 0.0004	37.910 0.0 0.004		Vel = 0.90	
405 to 406	17.59 17.59		1.63 90.44	6 6.357		10.500 10.500	120 0.0003	37.914 0.0 0.003		Vel = 0.91	
406 to 407	17.59 17.59		1.61 92.05	6 6.357		10.500 10.500	120 0.0004	37.917 0.0 0.004		Vel = 0.93	
407 to 408	17.59 17.59		1.67 93.72	6 6.357		10.500 10.500	120 0.0003	37.921 0.0 0.003		Vel = 0.95	
408 to 409	17.59 17.59		1.73 95.45	6 6.357		10.500 10.500	120 0.0004	37.924 0.0 0.004		Vel = 0.96	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
409 to 410	17.59 17.59		1.86 97.31	6 6.357			10.500 10.500	120 0.0004	37.928 0.0 0.004		Vel = 0.98	
410 to 411	17.59 17.59		2.03 99.34	6 6.357			10.500 10.500	120 0.0004	37.932 0.0 0.004		Vel = 1.00	
411 to 412	17.59 17.59		2.24 101.58	6 6.357			10.500 10.500	120 0.0005	37.936 0.0 0.005		Vel = 1.03	
412 to 413	17.59 17.59		2.47 104.05	6 6.357			6.170 6.170	120 0.0003	37.941 0.0 0.002		Vel = 1.05	
413 to 414	17.59 17.59		2.63 106.68	6 6.357			9.000 9.000	120 0.0004	37.943 0.0 0.004		Vel = 1.08	
414 to 415	17.59 17.59		2.87 109.55	6 6.357			10.000 10.000	120 0.0005	37.947 0.0 0.005		Vel = 1.11	
415 to 416	17.59 17.59		3.17 112.72	6 6.357	T	37.72	10.000 37.720 47.720	120 0.0005	37.952 0.0 0.023		Vel = 1.14	
416 to 417	17.59 17.41		4.69 117.41	6 6.357	E	17.603	23.300 17.603 40.903	120 0.0005	37.975 0.078 0.022		Vel = 1.19	
417			0.0 117.41						38.075		K Factor = 19.03	
446 to 487	19.52 18.94		8.33 8.33	2.5 2.635	T	16.474	48.160 16.474 64.634	120 0.0003	36.999 0.251 0.019		Vel = 0.49	
487 to 488	18.94 18.8		0.0 8.33	2.5 2.635			11.500 11.500	120 0.0003	37.269 0.061 0.003		Vel = 0.49	
488 to 489	18.8 18.65		0.0 8.33	2.5 2.635			13.000 13.000	120 0.0003	37.333 0.065 0.004		Vel = 0.49	
489 to 490	18.65 18.5		0.0 8.33	2.5 2.635			12.000 12.000	120 0.0002	37.402 0.065 0.003		Vel = 0.49	
490 to 443	18.5 17.59		0.0 8.33	2.5 2.635	T	16.474	75.680 16.474 92.154	120 0.0003	37.470 0.394 0.027		Vel = 0.49	
443			0.0 8.33						37.891		K Factor = 1.35	
447 to 442	19.52 17.59		7.60 7.6	2.5 2.635	2T	32.948	160.340 32.948 193.288	120 0.0002	37.009 0.836 0.047		Vel = 0.45	
442			0.0 7.60						37.892		K Factor = 1.23	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
448 to 441	19.52 17.59		7.10 7.1	2.5 2.635	2T	32.948	160.340 32.948 193.288	120 0.0002	37.016 0.836 0.042		Vel = 0.42	
441			0.0 7.10						37.894		K Factor = 1.15	
449 to 468	18.69 19.53		2.79 2.79	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	37.400 -0.364 0.001		Vel = 0.24	
468 to 501	19.53 18.83		0.0 2.79	2 2.157	E	6.153	57.490 6.153 63.643	120 0.0001	37.037 0.303 0.007		Vel = 0.24	
501 to 500	18.83 18.73		0.0 2.79	2 2.157			8.500 8.500	120 0.0001	37.347 0.043 0.001		Vel = 0.24	
500 to 502	18.73 18.59		0.0 2.79	2 2.157			11.500 11.500	120 0.0001	37.391 0.061 0.001		Vel = 0.24	
502 to 503	18.59 18.45		0.0 2.79	2 2.157			11.000 11.000	120 0.0001	37.453 0.061 0.001		Vel = 0.24	
503 to 440	18.45 17.59		0.0 2.79	2 2.157	T	12.307	71.840 12.307 84.147	120 0.0001	37.515 0.372 0.009		Vel = 0.24	
440			0.0 2.79						37.896		K Factor = 0.45	
450 to 467	18.69 19.53		2.49 2.49	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0002	37.406 -0.364 0.002		Vel = 0.22	
467 to 504	19.53 18.83		0.0 2.49	2 2.157	E	6.153	57.490 6.153 63.643	120 0.0001	37.044 0.303 0.005		Vel = 0.22	
504 to 505	18.83 18.73		0.0 2.49	2 2.157			8.500 8.500	120 0.0001	37.352 0.043 0.001		Vel = 0.22	
505 to 506	18.73 18.59		0.0 2.49	2 2.157			11.500 11.500	120 0	37.396 0.061 0.0		Vel = 0.22	
506 to 507	18.59 18.45		0.0 2.49	2 2.157			11.000 11.000	120 0.0001	37.457 0.061 0.001		Vel = 0.22	
507 to 457	18.45 17.6		0.0 2.49	2 2.157			71.010 71.010	120 0.0001	37.519 0.368 0.006		Vel = 0.22	
457 to 439	17.6 17.59		0.0 2.49	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	37.893 0.004 0.001		Vel = 0.22	
439			0.0 2.49						37.898		K Factor = 0.40	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
451 to 460	18.69 19.53		2.22 2.22	2 2.157	T	12.307 12.307 13.137	0.830 120	37.412 -0.364 0.001		Vel = 0.19	
460 to 508	19.53 18.45		0.0 2.22	2 2.157	E	6.153 88.490 6.153 94.643	120	37.049 0.468 0.006		Vel = 0.19	
508 to 512	18.45 17.6		0.0 2.22	2 2.157		71.010 71.010	120	37.523 0.368 0.005		Vel = 0.19	
512 to 438	17.6 17.59		0.0 2.22	2 2.157	T	12.307 0.830 12.307 13.137	120	37.896 0.004 0.001		Vel = 0.19	
438			0.0 2.22					37.901		K Factor = 0.36	
452 to 455	18.69 19.53		2.00 2.0	2 2.157	T	12.307 0.830 12.307 13.137	120	37.417 -0.364 0.001		Vel = 0.18	
455 to 459	19.53 17.6		0.0 2.0	2 2.157	E	6.153 159.500 6.153 165.653	120	37.054 0.836 0.009		Vel = 0.18	
459 to 436	17.6 17.59		0.0 2.0	2 2.157	T	12.307 0.830 12.307 13.137	120	37.899 0.004 0.001		Vel = 0.18	
436			0.0 2.00					37.904		K Factor = 0.32	
419 to 418	18.69 19.53		1.83 1.83	2 2.157	T	12.307 0.830 12.307 13.137	120	37.422 -0.364 0.001		Vel = 0.16	
418 to 402	19.53 17.6		0.0 1.83	2 2.157	E	6.153 159.500 6.153 165.653	120	37.059 0.836 0.007		Vel = 0.16	
402 to 403	17.6 17.59		0.0 1.83	2 2.157	T	12.307 0.830 12.307 13.137	120	37.902 0.004 0.001		Vel = 0.16	
403			0.0 1.83					37.907		K Factor = 0.30	
420 to 469	18.69 19.53		1.70 1.7	2 2.157	T	12.307 0.830 12.307 13.137	120	37.426 -0.364 0.001		Vel = 0.15	
469 to 404	19.53 17.59		0.0 1.7	2 2.157	E T	6.153 160.330 12.307 18.460 178.790	120	37.063 0.840 0.007		Vel = 0.15	
404			0.0 1.70					37.910		K Factor = 0.28	
421 to 470	18.69 19.53		1.63 1.63	2 2.157	T	12.307 0.830 12.307 13.137	120	37.430 -0.364 0.001		Vel = 0.14	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
470 to 405	19.53 17.59		0.0 1.63	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0	37.067 0.840 0.007		Vel = 0.14	
405			0.0 1.63					37.914		K Factor = 0.26	
422 to 471	18.69 19.53		1.61 1.61	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0	37.434 -0.364 0.0		Vel = 0.14	
471 to 406	19.53 17.59		0.0 1.61	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0	37.070 0.840 0.007		Vel = 0.14	
406			0.0 1.61					37.917		K Factor = 0.26	
423 to 473	18.69 19.53		1.67 1.67	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0001	37.437 -0.364 0.001		Vel = 0.15	
473 to 472	19.53 17.6		0.0 1.67	2 2.157	E T 6.153 12.307	159.500 6.153 165.653	120 0	37.074 0.836 0.006		Vel = 0.15	
472 to 407	17.6 17.59		0.0 1.67	2.5 2.635	T 16.474 17.304	0.830 16.474 17.304	120 0.0001	37.916 0.004 0.001		Vel = 0.10	
407			0.0 1.67					37.921		K Factor = 0.27	
424 to 474	18.69 19.53		1.73 1.73	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0001	37.440 -0.364 0.001		Vel = 0.15	
474 to 408	19.53 17.59		0.0 1.73	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0	37.077 0.840 0.007		Vel = 0.15	
408			0.0 1.73					37.924		K Factor = 0.28	
425 to 475	18.69 19.53		1.86 1.86	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0001	37.443 -0.364 0.001		Vel = 0.16	
475 to 409	19.53 17.59		0.0 1.86	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0	37.080 0.840 0.008		Vel = 0.16	
409			0.0 1.86					37.928		K Factor = 0.30	
426 to 476	18.69 19.53		2.03 2.03	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0001	37.445 -0.364 0.001		Vel = 0.18	
476 to 410	19.53 17.59		0.0 2.03	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0001	37.082 0.840 0.010		Vel = 0.18	
410			0.0 2.03					37.932		K Factor = 0.33	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
427 to 477	18.69 19.53		2.24 2.24	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	37.447 -0.364 0.001		Vel = 0.20	
477 to 411	19.53 17.59		0.0 2.24	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0001	37.084 0.840 0.012		Vel = 0.20	
411			0.0 2.24						37.936		K Factor = 0.36	
428 to 478	18.69 19.53		2.47 2.47	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0001	37.449 -0.364 0.001		Vel = 0.22	
478 to 412	19.53 17.59		0.0 2.47	2 2.157	E T	6.153 12.307	160.330 18.460 178.790	120 0.0001	37.086 0.840 0.015		Vel = 0.22	
412			0.0 2.47						37.941		K Factor = 0.40	
429 to 479	18.69 19.53		2.63 2.63	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0002	37.449 -0.364 0.002		Vel = 0.23	
479 to 492	19.53 18.78		0.0 2.63	2 2.157	E	6.153	62.000 6.153 68.153	120 0.0001	37.087 0.325 0.006		Vel = 0.23	
492 to 491	18.78 18.64		0.0 2.63	2 2.157			11.000 11.000	120 0	37.418 0.061 0.0		Vel = 0.23	
491 to 493	18.64 18.51		0.0 2.63	2 2.157			11.330 11.330	120 0.0002	37.479 0.056 0.002		Vel = 0.23	
493 to 494	18.51 18.36		0.0 2.63	2 2.157			12.000 12.000	120 0.0001	37.537 0.065 0.001		Vel = 0.23	
494 to 413	18.36 17.59		0.0 2.63	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0001	37.603 0.333 0.007		Vel = 0.23	
413			0.0 2.63						37.943		K Factor = 0.43	
430 to 480	18.69 19.53		2.87 2.87	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0002	37.450 -0.364 0.002		Vel = 0.25	
480 to 495	19.53 18.78		0.0 2.87	2 2.157	E	6.153	62.000 6.153 68.153	120 0.0001	37.088 0.325 0.007		Vel = 0.25	
495 to 496	18.78 18.64		0.0 2.87	2 2.157			11.000 11.000	120 0.0001	37.420 0.061 0.001		Vel = 0.25	
496 to 497	18.64 18.51		0.0 2.87	2 2.157			11.330 11.330	120 0.0001	37.482 0.056 0.001		Vel = 0.25	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
497 to 498	18.51 18.36		0.0 2.87	2 2.157			12.000 12.000	120 0.0002	37.539 0.065 0.002		Vel = 0.25	
498 to 414	18.36 17.59		0.0 2.87	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0001	37.606 0.333 0.008		Vel = 0.25	
414			0.0 2.87						37.947		K Factor = 0.47	
431 to 481	18.69 19.53		3.16 3.16	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0002	37.451 -0.364 0.002		Vel = 0.28	
481 to 499	19.53 18.36		0.0 3.16	2 2.157	E	6.153	96.330 6.153 102.483	120 0.0001	37.089 0.507 0.013		Vel = 0.28	
499 to 415	18.36 17.59		0.0 3.16	2 2.157	T	12.307	64.000 12.307 76.307	120 0.0001	37.609 0.333 0.010		Vel = 0.28	
415			0.0 3.16						37.952		K Factor = 0.51	
432 to 482	18.69 19.53		4.69 4.69	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0003	37.451 -0.364 0.004		Vel = 0.41	
482 to 416	19.53 17.59		0.0 4.69	2 2.157	E	6.153	160.330 6.153 166.483	120 0.0003	37.091 0.840 0.044		Vel = 0.41	
416			0.0 4.69						37.975		K Factor = 0.76	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS4 GR STOCK 8.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

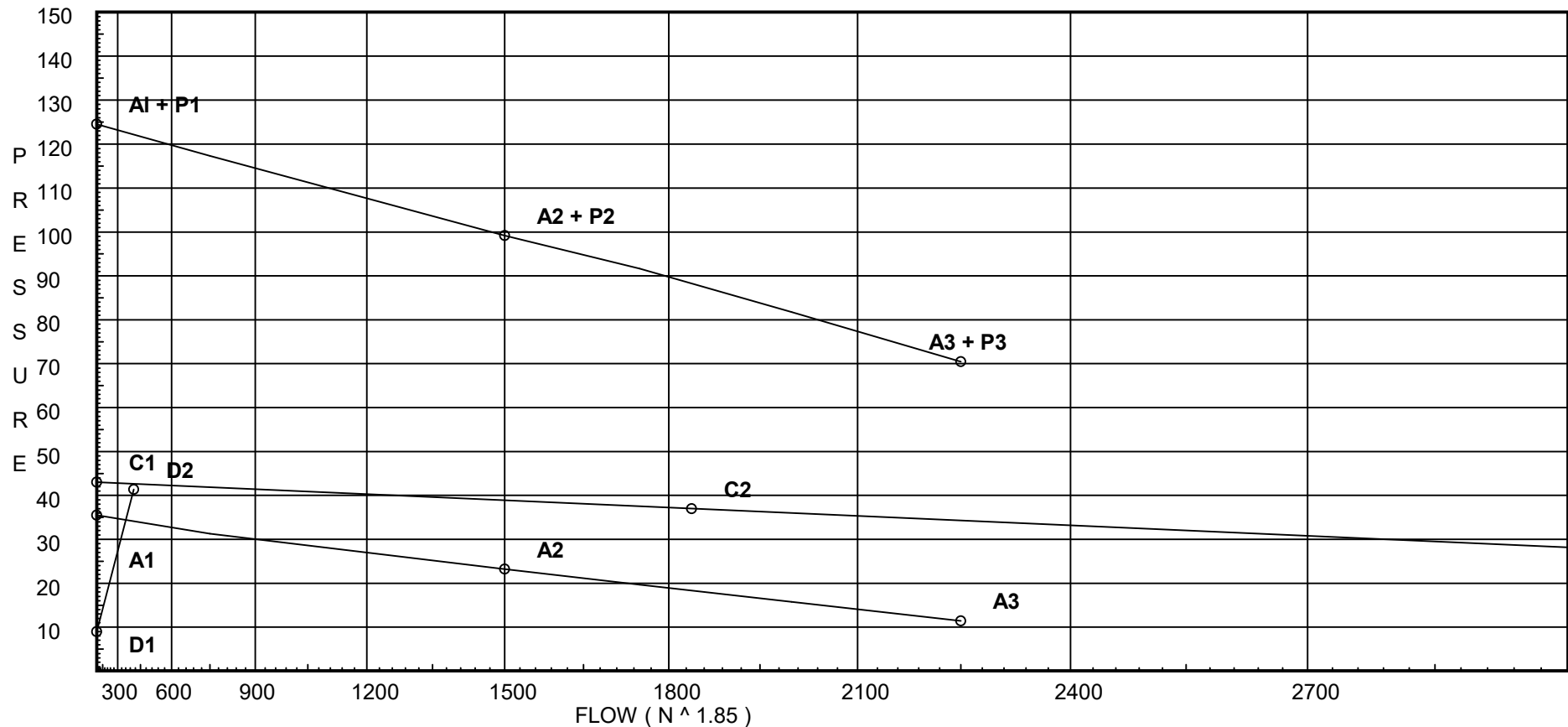
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.008
D2 - System Flow : 411.324
D2 - System Pressure : 41.343
Hose (Demand) :
D3 - System Demand : 411.324
Hose (Adj City) : 250
Safety Margin : 79.964



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			121.307	411.32	41.343
TEST	43.0	37	1839.0	42.095	661.32	42.096

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>	
SP04	19.25	11.2	21.0	51.32	0.01	130
EQ04	18.5		25.6			
SP02	19.55	11.2	21.0	51.32	0.01	130
EQ02	18.8		25.6			
SP03	19.4	11.2	21.0	51.32	0.01	130
EQ03	18.65		25.6			
SP01	19.69	11.2	21.0	51.32	0.01	130
EQ01	18.94		25.6			
483	18.8	10.14	25.6	51.33	K=K @ EQ02	
484	18.94	10.14	25.65	51.37	K=K @ EQ01	
445	19.52		27.46			
446	19.52		27.48			
447	19.52		27.58			
448	19.52		27.65			
449	18.69		28.25			
450	18.69		28.31			
451	18.69		28.36			
452	18.69		28.42			
419	18.69		28.46			
420	18.69		28.5			
421	18.69		28.54			
422	18.69		28.57			
423	18.69		28.61			
424	18.69		28.63			
425	18.69		28.66			
426	18.69		28.68			
427	18.69		28.7			
428	18.69		28.72			
429	18.69		28.72			
430	18.69		28.73			
431	18.69		28.74			
432	18.69		28.74			
433	18.69		28.74			
434	19.53		28.42			
417	17.41		29.95			
TR4	17.24		32.33			
BR4	2.83		38.87			
BR3	2.83		38.92			
127	2.792		40.06			
128	2.0		40.51			
PO	1.08		41.34			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
PI	1.08		33.29		
FLG	-5.0		36.14		
TEST	-2.0		42.1	250.0	
485	18.65	10.14	25.67	51.39	K=K @ EQ03
486	18.5	10.14	25.82	51.55	K=K @ EQ04
444	17.59		28.87		
443	17.59		28.88		
442	17.59		28.89		
441	17.59		28.9		
440	17.59		28.92		
439	17.59		28.95		
454	17.59		28.96		
438	17.59		28.97		
453	17.59		28.98		
437	17.59		29.0		
436	17.59		29.0		
435	17.59		29.02		
403	17.59		29.03		
404	17.59		29.06		
405	17.59		29.09		
406	17.59		29.12		
407	17.59		29.15		
408	17.59		29.19		
409	17.59		29.22		
410	17.59		29.26		
411	17.59		29.3		
412	17.59		29.34		
413	17.59		29.36		
414	17.59		29.4		
415	17.59		29.44		
416	17.59		29.67		
487	18.94	10.14	25.67	51.39	K=K @ EQ01
488	18.8	10.14	25.62	51.34	K=K @ EQ02
489	18.65	10.14	25.68	51.41	K=K @ EQ03
490	18.5	10.14	25.84	51.56	K=K @ EQ04
468	19.53		27.9		
501	18.83		28.27		
500	18.73		28.32		
502	18.59		28.39		
503	18.45		28.46		
467	19.53		27.96		
504	18.83		28.31		
505	18.73		28.36		
506	18.59		28.43		
507	18.45		28.5		
457	17.6		28.93		
460	19.53		28.01		
508	18.45		28.54		
512	17.6		28.96		
455	19.53		28.06		
459	17.6		28.99		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
418	19.53		28.1		
402	17.6		29.02		
469	19.53		28.14		
470	19.53		28.18		
471	19.53		28.22		
473	19.53		28.25		
472	17.6		29.15		
474	19.53		28.28		
475	19.53		28.3		
476	19.53		28.32		
477	19.53		28.34		
478	19.53		28.36		
479	19.53		28.37		
492	18.78		28.75		
491	18.64		28.82		
493	18.51		28.89		
494	18.36		28.96		
480	19.53		28.38		
495	18.78		28.77		
496	18.64		28.84		
497	18.51		28.91		
498	18.36		28.99		
481	19.53		28.39		
499	18.36		29.02		
482	19.53		28.41		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
SP04 to EQ04	19.25 18.5	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ04			0.0 51.32					25.603		K Factor = 10.14	
SP02 to EQ02	19.55 18.8	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ02			0.0 51.32					25.603		K Factor = 10.14	
SP03 to EQ03	19.4 18.65	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ03			0.0 51.32					25.603		K Factor = 10.14	
SP01 to EQ01	19.69 18.94	11.20	51.32 51.32	1 1.049	T 5.0	0.750 5.000 5.750	120 0.7440	21.000 0.325 4.278		Vel = 19.05	
EQ01			0.0 51.32					25.603		K Factor = 10.14	
483 to 484	18.8 18.94	10.14	54.21 54.21	2.5 2.635		11.500 11.500	120 0.0093	25.603 -0.061 0.107		K = K @ EQ02 Vel = 3.19	
484 to 445	18.94 19.52	10.14	51.37 105.58	2.5 2.635	T 16.474	48.160 16.474 64.634	120 0.0318	25.649 -0.251 2.058		K = K @ EQ01 Vel = 6.21	
445 to 446	19.52 19.52		0.0 105.58	4 4.26		9.000 9.000	120 0.0031	27.456 0.0 0.028		Vel = 2.38	
446 to 447	19.52 19.52		105.88 211.46	4 4.26		9.000 9.000	120 0.0111	27.484 0.0 0.100		Vel = 4.76	
447 to 448	19.52 19.52		-26.30 185.16	4 4.26		8.000 8.000	120 0.0086	27.584 0.0 0.069		Vel = 4.17	
448 to 449	19.52 18.69		-24.59 160.57	4 4.26	2E 26.334	8.830 26.334 35.164	120 0.0067	27.653 0.359 0.235		Vel = 3.61	
449 to 450	18.69 18.69		-9.78 150.79	4 4.26		10.500 10.500	120 0.0059	28.247 0.0 0.062		Vel = 3.39	
450 to 451	18.69 18.69		-8.71 142.08	4 4.26		10.500 10.500	120 0.0053	28.309 0.0 0.056		Vel = 3.20	
451 to 452	18.69 18.69		-7.80 134.28	4 4.26		10.500 10.500	120 0.0049	28.365 0.0 0.051		Vel = 3.02	
452 to 419	18.69 18.69		-7.02 127.26	4 4.26		10.500 10.500	120 0.0043	28.416 0.0 0.045		Vel = 2.86	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
419 to 420	18.69 18.69		-6.40 120.86	4 4.26		10.500 10.500	120 0.0039	28.461 0.0 0.041		Vel = 2.72	
420 to 421	18.69 18.69		-5.95 114.91	4 4.26		10.500 10.500	120 0.0036	28.502 0.0 0.038		Vel = 2.59	
421 to 422	18.69 18.69		-5.67 109.24	4 4.26		10.500 10.500	120 0.0032	28.540 0.0 0.034		Vel = 2.46	
422 to 423	18.69 18.69		-5.57 103.67	4 4.26		10.500 10.500	120 0.0030	28.574 0.0 0.032		Vel = 2.33	
423 to 424	18.69 18.69		-5.77 97.9	4 4.26		10.500 10.500	120 0.0027	28.606 0.0 0.028		Vel = 2.20	
424 to 425	18.69 18.69		-5.92 91.98	4 4.26		10.500 10.500	120 0.0024	28.634 0.0 0.025		Vel = 2.07	
425 to 426	18.69 18.69		-6.34 85.64	4 4.26		10.500 10.500	120 0.0020	28.659 0.0 0.021		Vel = 1.93	
426 to 427	18.69 18.69		-6.89 78.75	4 4.26		10.500 10.500	120 0.0018	28.680 0.0 0.019		Vel = 1.77	
427 to 428	18.69 18.69		-7.57 71.18	4 4.26		10.500 10.500	120 0.0015	28.699 0.0 0.016		Vel = 1.60	
428 to 429	18.69 18.69		-8.35 62.83	4 4.26		6.170 6.170	120 0.0011	28.715 0.0 0.007		Vel = 1.41	
429 to 430	18.69 18.69		-8.86 53.97	4 4.26		9.000 9.000	120 0.0009	28.722 0.0 0.008		Vel = 1.21	
430 to 431	18.69 18.69		-9.68 44.29	4 4.26		10.000 10.000	120 0.0006	28.730 0.0 0.006		Vel = 1.00	
431 to 432	18.69 18.69		-10.65 33.64	4 4.26		10.000 10.000	120 0.0004	28.736 0.0 0.004		Vel = 0.76	
432 to 433	18.69 18.69		-15.76 17.88	4 4.26		9.000 9.000	120 0.0001	28.740 0.0 0.001		Vel = 0.40	
433 to 434	18.69 19.53		0.0 17.88	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0032	28.741 -0.364 0.042		Vel = 1.57	
434 to 417	19.53 17.41		0.0 17.88	2 2.157	E T 12.307	174.640 18.460 193.100	120 0.0032	28.419 0.918 0.610		Vel = 1.57	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
417 to TR4	17.41 17.24		393.44 411.32	6 6.357	6E	105.616	320.930 105.616 426.546	120 0.0054	29.947 0.074 2.307			
TR4 to BR4	17.24 2.83		0.0 411.32	6 6.357	T G	37.72 3.772	14.410 41.492 55.902	120 0.0054	32.328 6.241 0.302		Vel = 4.16	
BR4 to BR3	2.83 2.83		0.0 411.32	4 4.26			1.250 1.250	120 0.0376	38.871 0.0 0.047		Vel = 9.26	
BR3 to 127	2.83 2.792		0.0 411.32	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0380	38.918 0.016 1.122		Vel = 9.26	
127 to 128	2.792 2		0.0 411.32	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0054	40.056 0.343 0.108		Vel = 4.16	
128 to PO	2 1.080		0.0 411.32	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0015	40.507 0.398 0.438		Vel = 2.47	
PO			0.0 411.32						41.343		K Factor = 63.97	
System Demand Pressure									41.343			
Safety Margin									79.964			
Continuation Pressure									121.307			
Pressure @ Pump Outlet									121.307			
Pressure From Pump Curve									-88.013			
Pressure @ Pump Inlet									33.294			
PI to FLG	1.080 -5		0.0 411.32	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0015	33.294 2.633 0.212		Vel = 2.47	
FLG to TEST	-5 -2		0.0 411.32	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0011	36.139 5.701 0.255		* * Fixed Loss = 7 Vel = 2.46	
TEST			250.00 661.32						42.095		Qa = 250.00 K Factor = 101.93	
483 to 485	18.8 18.65		-2.89 2.635	2.5			13.000 13.000	120 -0.0001	25.603 0.065 -0.001		Vel = 0.17	
485 to 486	18.65 18.5	10.14	51.39 48.5	2.5			12.000 12.000	120 0.0076	25.667 0.065 0.091		K = K @ EQ03 Vel = 2.85	
486 to 444	18.5 17.59	10.14	51.55 100.05	2.5	T	16.474	75.680 16.474 92.154	120 0.0288	25.823 0.394 2.657		K = K @ EQ04 Vel = 5.89	
444 to 443	17.59 17.59		0.0 100.05	6 6.357			9.000 9.000	120 0.0003	28.874 0.0 0.003		Vel = 1.01	
443 to 442	17.59 17.59		99.81 199.86	6 6.357			9.000 9.000	120 0.0014	28.877 0.0 0.013		Vel = 2.02	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
442 to 441	17.59 17.59		26.31 226.17	6 6.357		8.000 8.000	120 0.0018	28.890 0.0 0.014		Vel = 2.29	
441 to 440	17.59 17.59		24.59 250.76	6 6.357		8.000 8.000	120 0.0022	28.904 0.0 0.018		Vel = 2.53	
440 to 439	17.59 17.59		9.77 260.53	6 6.357		10.500 10.500	120 0.0023	28.922 0.0 0.024		Vel = 2.63	
439 to 454	17.59 17.59		8.71 269.24	6 6.357		6.500 6.500	120 0.0025	28.946 0.0 0.016		Vel = 2.72	
454 to 438	17.59 17.59		0.0 269.24	6 6.357		4.000 4.000	120 0.0025	28.962 0.0 0.010		Vel = 2.72	
438 to 453	17.59 17.59		7.80 277.04	6 6.357		2.000 2.000	120 0.0025	28.972 0.0 0.005		Vel = 2.80	
453 to 437	17.59 17.59		0.0 277.04	6 6.357		7.250 7.250	120 0.0026	28.977 0.0 0.019		Vel = 2.80	
437 to 436	17.59 17.59		0.0 277.04	6 6.357		1.250 1.250	120 0.0032	28.996 0.0 0.004		Vel = 2.80	
436 to 435	17.59 17.59		7.02 284.06	6 6.357		8.000 8.000	120 0.0026	29.000 0.0 0.021		Vel = 2.87	
435 to 403	17.59 17.59		0.0 284.06	6 6.357		2.500 2.500	120 0.0028	29.021 0.0 0.007		Vel = 2.87	
403 to 404	17.59 17.59		6.40 290.46	6 6.357		10.500 10.500	120 0.0029	29.028 0.0 0.030		Vel = 2.94	
404 to 405	17.59 17.59		5.95 296.41	6 6.357		10.500 10.500	120 0.0030	29.058 0.0 0.031		Vel = 3.00	
405 to 406	17.59 17.59		5.67 302.08	6 6.357		10.500 10.500	120 0.0030	29.089 0.0 0.032		Vel = 3.05	
406 to 407	17.59 17.59		5.57 307.65	6 6.357		10.500 10.500	120 0.0031	29.121 0.0 0.033		Vel = 3.11	
407 to 408	17.59 17.59		5.77 313.42	6 6.357		10.500 10.500	120 0.0033	29.154 0.0 0.035		Vel = 3.17	
408 to 409	17.59 17.59		5.92 319.34	6 6.357		10.500 10.500	120 0.0033	29.189 0.0 0.035		Vel = 3.23	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
409 to 410	17.59 17.59		6.34 325.68	6 6.357		10.500 10.500	120 0.0035	29.224 0.0 0.037		Vel = 3.29	
410 to 411	17.59 17.59		6.90 332.58	6 6.357		10.500 10.500	120 0.0036	29.261 0.0 0.038		Vel = 3.36	
411 to 412	17.59 17.59		7.57 340.15	6 6.357		10.500 10.500	120 0.0038	29.299 0.0 0.040		Vel = 3.44	
412 to 413	17.59 17.59		8.34 348.49	6 6.357		6.170 6.170	120 0.0041	29.339 0.0 0.025		Vel = 3.52	
413 to 414	17.59 17.59		8.86 357.35	6 6.357		9.000 9.000	120 0.0041	29.364 0.0 0.037		Vel = 3.61	
414 to 415	17.59 17.59		9.68 367.03	6 6.357		10.000 10.000	120 0.0044	29.401 0.0 0.044		Vel = 3.71	
415 to 416	17.59 17.59		10.65 377.68	6 6.357	T 37.72	10.000 37.720 47.720	120 0.0046	29.445 0.0 0.221		Vel = 3.82	
416 to 417	17.59 17.41		15.76 393.44	6 6.357	E 17.603	23.300 17.603 40.903	120 0.0050	29.666 0.078 0.203		Vel = 3.98	
417			0.0 393.44					29.947		K Factor = 71.90	
446 to 487	19.52 18.94		-105.88 -105.88	2.5 2.635	T 16.474	48.160 16.474 64.634	120 -0.0320	27.484 0.251 -2.069		Vel = 6.23	
487 to 488	18.94 18.8	10.14	51.39 -54.49	2.5 2.635		11.500 11.500	120 -0.0094	25.666 0.061 -0.108		K = K @ EQ01 Vel = 3.21	
488 to 489	18.8 18.65	10.14	51.34 -3.15	2.5 2.635		13.000 13.000	120 -0.0001	25.619 0.065 -0.001		K = K @ EQ02 Vel = 0.19	
489 to 490	18.65 18.5	10.14	51.41 48.26	2.5 2.635		12.000 12.000	120 0.0075	25.683 0.065 0.090		K = K @ EQ03 Vel = 2.84	
490 to 443	18.5 17.59	10.14	51.56 99.82	2.5 2.635	T 16.474	75.680 16.474 92.154	120 0.0287	25.838 0.394 2.645		K = K @ EQ04 Vel = 5.87	
443			0.0 99.82					28.877		K Factor = 18.58	
447 to 442	19.52 17.59		26.30 26.3	2.5 2.635	2T 32.948	160.340 32.948 193.288	120 0.0024	27.584 0.836 0.470		Vel = 1.55	
442			0.0 26.30					28.890		K Factor = 4.89	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
448 to 441	19.52 17.59		24.59 24.59	2.5 2.635	2T	32.948	160.340 32.948 193.288	120 0.0021	27.653 0.836 0.415		Vel = 1.45	
441			0.0 24.59						28.904		K Factor = 4.57	
449 to 468	18.69 19.53		9.77 9.77	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0011	28.247 -0.364 0.014		Vel = 0.86	
468 to 501	19.53 18.83		0.0 9.77	2 2.157	E	6.153	57.490 6.153 63.643	120 0.0010	27.897 0.303 0.066		Vel = 0.86	
501 to 500	18.83 18.73		0.0 9.77	2 2.157			8.500 8.500	120 0.0011	28.266 0.043 0.009		Vel = 0.86	
500 to 502	18.73 18.59		0.0 9.77	2 2.157			11.500 11.500	120 0.0010	28.318 0.061 0.011		Vel = 0.86	
502 to 503	18.59 18.45		0.0 9.77	2 2.157			11.000 11.000	120 0.0010	28.390 0.061 0.011		Vel = 0.86	
503 to 440	18.45 17.59		0.0 9.77	2 2.157	T	12.307	71.840 12.307 84.147	120 0.0010	28.462 0.372 0.088		Vel = 0.86	
440			0.0 9.77						28.922		K Factor = 1.82	
450 to 467	18.69 19.53		8.71 8.71	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0009	28.309 -0.364 0.012		Vel = 0.76	
467 to 504	19.53 18.83		0.0 8.71	2 2.157	E	6.153	57.490 6.153 63.643	120 0.0008	27.957 0.303 0.053		Vel = 0.76	
504 to 505	18.83 18.73		0.0 8.71	2 2.157			8.500 8.500	120 0.0008	28.313 0.043 0.007		Vel = 0.76	
505 to 506	18.73 18.59		0.0 8.71	2 2.157			11.500 11.500	120 0.0009	28.363 0.061 0.010		Vel = 0.76	
506 to 507	18.59 18.45		0.0 8.71	2 2.157			11.000 11.000	120 0.0007	28.434 0.061 0.008		Vel = 0.76	
507 to 457	18.45 17.6		0.0 8.71	2 2.157			71.010 71.010	120 0.0008	28.503 0.368 0.060		Vel = 0.76	
457 to 439	17.6 17.59		0.0 8.71	2 2.157	T	12.307	0.830 12.307 13.137	120 0.0008	28.931 0.004 0.011		Vel = 0.76	
439			0.0 8.71						28.946		K Factor = 1.62	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
451 to 460	18.69 19.53		7.80 7.8	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0007	28.365 -0.364 0.009	Vel = 0.68	
460 to 508	19.53 18.45		0.0 7.8	2 2.157	E	6.153 6.153 94.643	88.490 6.153 94.643	120 0.0007	28.010 0.468 0.064	Vel = 0.68	
508 to 512	18.45 17.6		0.0 7.8	2 2.157		71.010 71.010	71.010	120 0.0007	28.542 0.368 0.049	Vel = 0.68	
512 to 438	17.6 17.59		0.0 7.8	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0007	28.959 0.004 0.009	Vel = 0.68	
438			0.0 7.80						28.972	K Factor = 1.45	
452 to 455	18.69 19.53		7.02 7.02	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0005	28.416 -0.364 0.007	Vel = 0.62	
455 to 459	19.53 17.6		0.0 7.02	2 2.157	E	6.153 6.153 165.653	159.500 6.153 165.653	120 0.0006	28.059 0.836 0.093	Vel = 0.62	
459 to 436	17.6 17.59		0.0 7.02	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0006	28.988 0.004 0.008	Vel = 0.62	
436			0.0 7.02						29.000	K Factor = 1.30	
419 to 418	18.69 19.53		6.40 6.4	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0005	28.461 -0.364 0.006	Vel = 0.56	
418 to 402	19.53 17.6		0.0 6.4	2 2.157	E	6.153 6.153 165.653	159.500 6.153 165.653	120 0.0005	28.103 0.836 0.079	Vel = 0.56	
402 to 403	17.6 17.59		0.0 6.4	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0005	29.018 0.004 0.006	Vel = 0.56	
403			0.0 6.40						29.028	K Factor = 1.19	
420 to 469	18.69 19.53		5.95 5.95	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0005	28.502 -0.364 0.006	Vel = 0.52	
469 to 404	19.53 17.59		0.0 5.95	2 2.157	E T	6.153 12.307 178.790	160.330 18.460 178.790	120 0.0004	28.144 0.840 0.074	Vel = 0.52	
404			0.0 5.95						29.058	K Factor = 1.10	
421 to 470	18.69 19.53		5.67 5.67	2 2.157	T	12.307 12.307 13.137	0.830 12.307 13.137	120 0.0004	28.540 -0.364 0.005	Vel = 0.50	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
470 to 405	19.53 17.59		0.0 5.67	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0004	28.181 0.840 0.068		Vel = 0.50	
405			0.0 5.67					29.089		K Factor = 1.05	
422 to 471	18.69 19.53		5.57 5.57	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	28.574 -0.364 0.006		Vel = 0.49	
471 to 406	19.53 17.59		0.0 5.57	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0004	28.216 0.840 0.065		Vel = 0.49	
406			0.0 5.57					29.121		K Factor = 1.03	
423 to 473	18.69 19.53		5.77 5.77	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0004	28.606 -0.364 0.005		Vel = 0.51	
473 to 472	19.53 17.6		0.0 5.77	2 2.157	E T 6.153 12.307	159.500 6.153 165.653	120 0.0004	28.247 0.836 0.064		Vel = 0.51	
472 to 407	17.6 17.59		0.0 5.77	2.5 2.635	T 16.474 16.474	0.830 16.474 17.304	120 0.0002	29.147 0.004 0.003		Vel = 0.34	
407			0.0 5.77					29.154		K Factor = 1.07	
424 to 474	18.69 19.53		5.92 5.92	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0004	28.634 -0.364 0.005		Vel = 0.52	
474 to 408	19.53 17.59		0.0 5.92	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0004	28.275 0.840 0.074		Vel = 0.52	
408			0.0 5.92					29.189		K Factor = 1.10	
425 to 475	18.69 19.53		6.34 6.34	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0005	28.659 -0.364 0.006		Vel = 0.56	
475 to 409	19.53 17.59		0.0 6.34	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0005	28.301 0.840 0.083		Vel = 0.56	
409			0.0 6.34					29.224		K Factor = 1.17	
426 to 476	18.69 19.53		6.90 6.9	2 2.157	T 6.153 12.307	0.830 12.307 13.137	120 0.0006	28.680 -0.364 0.008		Vel = 0.61	
476 to 410	19.53 17.59		0.0 6.9	2 2.157	E T 6.153 12.307	160.330 18.460 178.790	120 0.0005	28.324 0.840 0.097		Vel = 0.61	
410			0.0 6.90					29.261		K Factor = 1.28	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
427 to 477	18.69 19.53		7.57 7.57	2 2.157	T	12.307 12.307 13.137	120 0.0007	28.699 -0.364 0.009		Vel = 0.66	
477 to 411	19.53 17.59		0.0 7.57	2 2.157	E T	6.153 12.307 178.790	120 0.0006	28.344 0.840 0.115		Vel = 0.66	
411			0.0 7.57					29.299		K Factor = 1.40	
428 to 478	18.69 19.53		8.35 8.35	2 2.157	T	12.307 12.307 13.137	120 0.0008	28.715 -0.364 0.010		Vel = 0.73	
478 to 412	19.53 17.59		0.0 8.35	2 2.157	E T	6.153 12.307 178.790	120 0.0008	28.361 0.840 0.138		Vel = 0.73	
412			0.0 8.35					29.339		K Factor = 1.54	
429 to 479	18.69 19.53		8.86 8.86	2 2.157	T	12.307 12.307 13.137	120 0.0009	28.722 -0.364 0.012		Vel = 0.78	
479 to 492	19.53 18.78		0.0 8.86	2 2.157	E	6.153 6.153 68.153	120 0.0009	28.370 0.325 0.058		Vel = 0.78	
492 to 491	18.78 18.64		0.0 8.86	2 2.157		11.000 11.000	120 0.0008	28.753 0.061 0.009		Vel = 0.78	
491 to 493	18.64 18.51		0.0 8.86	2 2.157		11.330 11.330	120 0.0009	28.823 0.056 0.010		Vel = 0.78	
493 to 494	18.51 18.36		0.0 8.86	2 2.157		12.000 12.000	120 0.0009	28.889 0.065 0.011		Vel = 0.78	
494 to 413	18.36 17.59		0.0 8.86	2 2.157	T	12.307 12.307 76.307	120 0.0009	28.965 0.333 0.066		Vel = 0.78	
413			0.0 8.86					29.364		K Factor = 1.64	
430 to 480	18.69 19.53		9.68 9.68	2 2.157	T	12.307 12.307 13.137	120 0.0011	28.730 -0.364 0.014		Vel = 0.85	
480 to 495	19.53 18.78		0.0 9.68	2 2.157	E	6.153 6.153 68.153	120 0.0010	28.380 0.325 0.069		Vel = 0.85	
495 to 496	18.78 18.64		0.0 9.68	2 2.157		11.000 11.000	120 0.0009	28.774 0.061 0.010		Vel = 0.85	
496 to 497	18.64 18.51		0.0 9.68	2 2.157		11.330 11.330	120 0.0011	28.845 0.056 0.012		Vel = 0.85	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
497 to 498	18.51 18.36		0.0 9.68	2 2.157		12.000 12.000	120 0.0010	28.913 0.065 0.012		Vel = 0.85	
498 to 414	18.36 17.59		0.0 9.68	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0010	28.990 0.333 0.078		Vel = 0.85	
414			0.0 9.68					29.401		K Factor = 1.79	
431 to 481	18.69 19.53		10.65 10.65	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0012	28.736 -0.364 0.016		Vel = 0.94	
481 to 499	19.53 18.36		0.0 10.65	2 2.157	E 6.153	96.330 6.153 102.483	120 0.0012	28.388 0.507 0.124		Vel = 0.94	
499 to 415	18.36 17.59		0.0 10.65	2 2.157	T 12.307	64.000 12.307 76.307	120 0.0012	29.019 0.333 0.093		Vel = 0.94	
415			0.0 10.65					29.445		K Factor = 1.96	
432 to 482	18.69 19.53		15.76 15.76	2 2.157	T 12.307	0.830 12.307 13.137	120 0.0025	28.740 -0.364 0.033		Vel = 1.38	
482 to 416	19.53 17.59		0.0 15.76	2 2.157	E 6.153	160.330 6.153 166.483	120 0.0025	28.409 0.840 0.417		Vel = 1.38	
416			0.0 15.76					29.666		K Factor = 2.89	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 16
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
484	445	48.160	486	444	75.680
446	487	48.160	490	443	75.680
484	445	48.160	486	444	75.680
446	487	48.160	490	443	75.680

Flow		Safety	Pressure
Required		Margin	Differential
Left	11.500 661.326	80.024	-0.060
Area Calculated	661.324	79.964	0.000
Right	11.500 661.323	79.968	-0.004

Typical Distance Between Heads = 11.500

Split Point Used in Worst Area Peaked = 483

Split Point Used in Area Calculated = 483



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS5 GM SALES 4.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

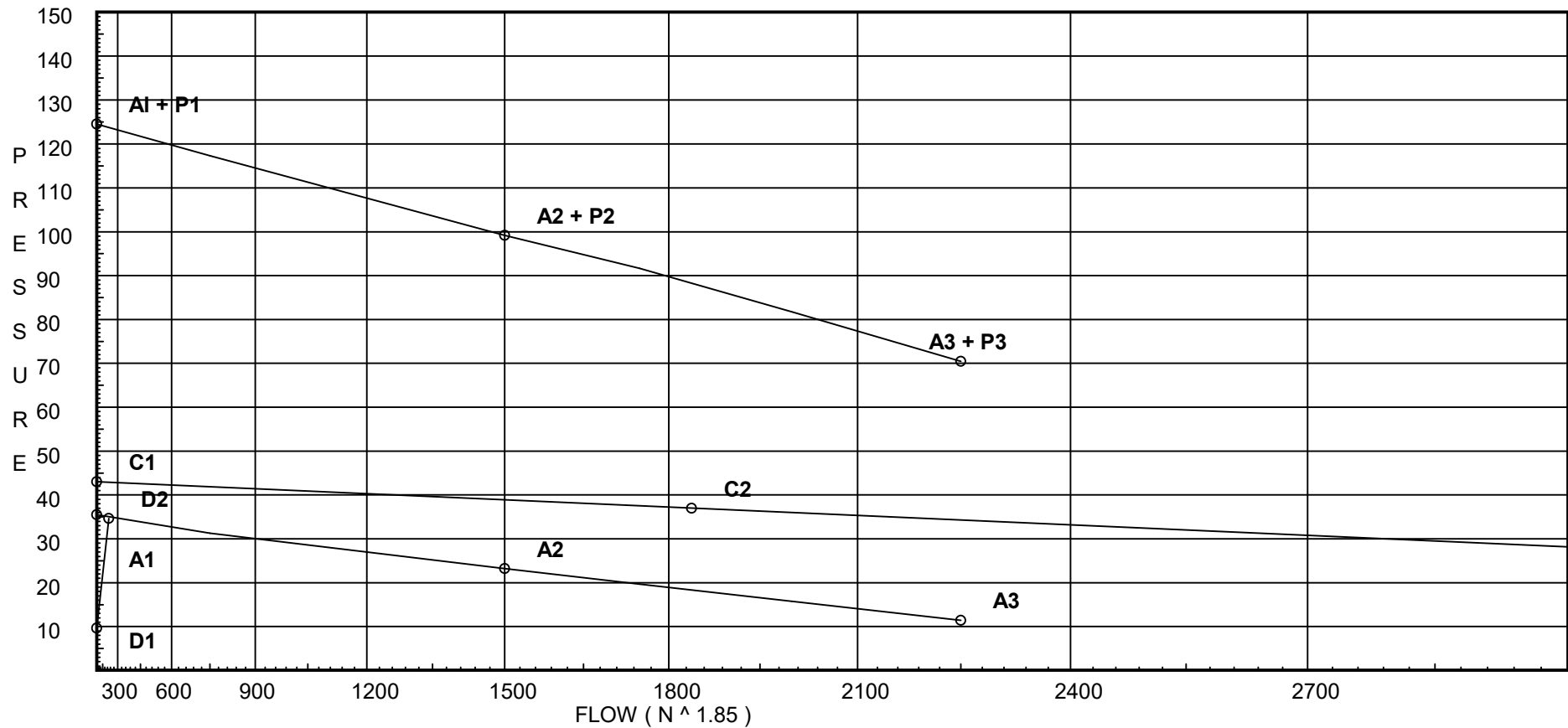
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.680
D2 - System Flow : 223.313
D2 - System Pressure : 34.640
Hose (Demand) :
D3 - System Demand : 223.313
Hose (Adj City) : 250
Safety Margin : 88.511



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.151	223.31	34.64
TEST	43.0	37	1839.0	42.513	473.31	42.513

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	14.0	16.8	11.0	55.72	0.01	130
EQ02	20.35		18.08			
DP01	14.0	16.8	11.0	55.72	0.01	130
EQ01	20.49		18.14			
DP04	14.0	16.8	11.0	55.72	0.01	130
EQ04	20.04		17.95			
DP03	14.0	16.8	11.0	55.72	0.01	130
EQ03	20.2		18.02			
587	20.35	13.1	18.08	55.72	K=K @ EQ02	
588	20.49		18.96			
548	21.03		23.41			
547	21.03		23.42			
546	21.03		23.48			
545	21.03		23.58			
544	21.03		23.63			
543	21.03		23.7			
542	21.03		23.75			
541	21.03		23.8			
540	21.03		23.84			
539	21.03		23.87			
538	21.03		23.9			
537	21.03		23.92			
536	21.03		23.94			
535	21.03		23.95			
534	21.03		23.96			
533	21.03		23.97			
532	21.03		23.98			
531	21.03		23.98			
530	21.03		23.99			
568	21.03		23.99			
527	20.13		24.38			
528	20.06		24.41			
529	19.92		24.47			
564	19.78		24.54			
563	19.59		24.62			
513	19.59		24.62			
514	19.59		24.62			
515	19.59		24.62			
516	18.76		24.99			
517	18.76		24.99			
518	18.76		25.0			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
519	18.76		25.0		
520	18.76		25.0		
521	18.76		25.01		
522	18.76		25.02		
523	18.76		25.03		
524	18.76		25.04		
525	18.76		25.08		
526	16.58		26.37		
TR5	16.41		27.35		
BR5	2.83		33.33		
BR4	2.83		33.33		
BR3	2.83		33.34		
127	2.792		33.72		
128	2.0		34.1		
PO	1.08		34.64		
PI	1.08		34.47		
FLG	-5.0		37.17		
TEST	-2.0		42.51	250.0	
589	20.2	13.13	18.15	55.92	K=K @ EQ03
590	20.04		19.33		
584	19.59		23.3		
556	18.76		24.62		
557	18.76		24.63		
558	18.76		24.66		
559	18.76		24.72		
560	18.76		24.77		
561	18.76		24.83		
562	18.76		24.9		
549	21.03		23.41		
550	21.03		23.42		
551	21.03		23.42		
552	19.59		24.24		
553	18.76		24.62		
554	18.76		24.62		
555	18.76		24.62		
591	20.04		23.98		
585	19.59		24.24		
586	19.59		24.24		
592	20.49		18.97		
593	20.35	13.1	18.09	55.74	K=K @ EQ02
594	20.2	13.13	18.16	55.94	K=K @ EQ03
595	20.04		19.34		
583	19.59		23.32		
582	19.59		24.29		
581	19.59		24.35		
580	19.59		24.4		
579	19.59		24.46		
578	19.59		24.52		
577	19.59		24.66		
576	19.59		24.65		
575	19.59		24.64		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
574	19.59		24.64		
573	19.59		24.64		
572	19.59		24.63		
604	20.2		24.34		
571	19.59		24.63		
600	20.56		24.18		
601	20.47		24.22		
602	20.33		24.29		
603	20.2		24.35		
570	19.59		24.63		
597	20.56		24.19		
596	20.47		24.23		
598	20.33		24.29		
599	20.2		24.35		
569	19.59		24.63		
565	20.19		24.36		
566	20.06		24.41		
567	19.92		24.47		
605	19.78		24.54		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
DP02 to EQ02	14 20.35	16.80	55.72 55.72	1 1.049	T 5.0	6.350 5.000 11.350	120 0.8661	11.000 -2.750 9.830		Vel = 20.68	
EQ02			0.0 55.72					18.080		K Factor = 13.10	
DP01 to EQ01	14 20.49	16.80	55.72 55.72	1 1.049	T 5.0	6.490 5.000 11.490	120 0.8661	11.000 -2.811 9.952		Vel = 20.68	
EQ01			0.0 55.72					18.141		K Factor = 13.08	
DP04 to EQ04	14 20.04	16.80	55.72 55.72	1 1.049	T 5.0	6.040 5.000 11.040	120 0.8661	11.000 -2.616 9.562		Vel = 20.68	
EQ04			0.0 55.72					17.946		K Factor = 13.15	
DP03 to EQ03	14 20.2	16.80	55.72 55.72	1 1.049	T 5.0	6.200 5.000 11.200	120 0.8662	11.000 -2.685 9.701		Vel = 20.68	
EQ03			0.0 55.72					18.016		K Factor = 13.13	
587 to 588	20.35 20.49	13.1	55.17 55.17	1.5		11.000 11.000	120 0.0854	18.080 -0.061 0.939		K = K @ EQ02 Vel = 7.97	
588 to 548	20.49 21.03		0.0 55.17	1.5 1.682	T 9.9	45.000 9.900 54.900	120 0.0853	18.958 -0.234 4.684		Vel = 7.97	
548 to 547	21.03 21.03		-18.78 36.39	3 3.26		9.000 9.000	120 0.0016	23.408 0.0 0.014		Vel = 1.40	
547 to 546	21.03 21.03		55.19 91.58	3 3.26		6.170 6.170	120 0.0088	23.422 0.0 0.054		Vel = 3.52	
546 to 545	21.03 21.03		-6.00 85.58	3 3.26		13.500 13.500	120 0.0077	23.476 0.0 0.104		Vel = 3.29	
545 to 544	21.03 21.03		-4.91 80.67	3 3.26		7.500 7.500	120 0.0068	23.580 0.0 0.051		Vel = 3.10	
544 to 543	21.03 21.03		-5.23 75.44	3 3.26		10.500 10.500	120 0.0061	23.631 0.0 0.064		Vel = 2.90	
543 to 542	21.03 21.03		-5.16 70.28	3 3.26		10.500 10.500	120 0.0052	23.695 0.0 0.055		Vel = 2.70	
542 to 541	21.03 21.03		-5.31 64.97	3 3.26		10.500 10.500	120 0.0047	23.750 0.0 0.049		Vel = 2.50	
541 to 540	21.03 21.03		-6.77 58.2	3 3.26		10.500 10.500	120 0.0037	23.799 0.0 0.039		Vel = 2.24	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
540 to 539	21.03 21.03		-6.01 52.19	3 3.26			10.500 10.500	120 0.0030	23.838 0.0 0.032		Vel = 2.01	
539 to 538	21.03 21.03		-5.33 46.86	3 3.26			10.500 10.500	120 0.0026	23.870 0.0 0.027		Vel = 1.80	
538 to 537	21.03 21.03		-4.70 42.16	3 3.26			10.500 10.500	120 0.0020	23.897 0.0 0.021		Vel = 1.62	
537 to 536	21.03 21.03		-4.13 38.03	3 3.26			10.500 10.500	120 0.0017	23.918 0.0 0.018		Vel = 1.46	
536 to 535	21.03 21.03		-3.61 34.42	3 3.26			10.500 10.500	120 0.0014	23.936 0.0 0.015		Vel = 1.32	
535 to 534	21.03 21.03		-3.11 31.31	3 3.26			10.500 10.500	120 0.0012	23.951 0.0 0.013		Vel = 1.20	
534 to 533	21.03 21.03		-2.64 28.67	3 3.26			10.500 10.500	120 0.0010	23.964 0.0 0.010		Vel = 1.10	
533 to 532	21.03 21.03		-2.16 26.51	3 3.26			8.000 8.000	120 0.0010	23.974 0.0 0.008		Vel = 1.02	
532 to 531	21.03 21.03		-8.10 18.41	3 3.26			8.000 8.000	120 0.0004	23.982 0.0 0.003		Vel = 0.71	
531 to 530	21.03 21.03		-6.72 11.69	3 3.26			9.000 9.000	120 0.0002	23.985 0.0 0.002		Vel = 0.45	
530 to 568	21.03 21.03		-5.95 5.74	3 3.26			9.000 9.000	120 0	23.987 0.0 0.0		Vel = 0.22	
568 to 527	21.03 20.13		0.0 5.74	3 3.26	T	20.159	74.490 20.159 94.649	120 0.0001	23.987 0.390 0.005		Vel = 0.22	
527 to 528	20.13 20.06		0.0 5.74	3 3.26			6.000 6.000	120 0.0002	24.382 0.030 0.001		Vel = 0.22	
528 to 529	20.06 19.92		0.0 5.74	3 3.26			11.000 11.000	120 0	24.413 0.061 0.0		Vel = 0.22	
529 to 564	19.92 19.78		0.0 5.74	3 3.26			12.000 12.000	120 0	24.474 0.061 0.0		Vel = 0.22	
564 to 563	19.78 19.59		0.0 5.74	3 3.26	T	20.159	15.510 20.159 35.669	120 0.0001	24.535 0.082 0.002		Vel = 0.22	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
563 to 513	19.59 19.59		0.0 5.74	4 4.26			9.000 9.000	120 0	24.619 0.0			
513 to 514	19.59 19.59		5.95 11.69	4 4.26			9.000 9.000	120 0.0001	24.619 0.0		Vel = 0.13	
514 to 515	19.59 19.59		6.72 18.41	4 4.26			8.000 8.000	120 0.0001	24.620 0.0		Vel = 0.26	
515 to 516	19.59 18.76		8.10 26.51	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0003	24.621 0.359 0.009		Vel = 0.41	
516 to 517	18.76 18.76		2.16 28.67	4 4.26			10.500 10.500	120 0.0003	24.989 0.0		Vel = 0.60	
517 to 518	18.76 18.76		2.64 31.31	4 4.26			10.500 10.500	120 0.0003	24.992 0.0		Vel = 0.65	
518 to 519	18.76 18.76		3.11 34.42	4 4.26			10.500 10.500	120 0.0003	24.995 0.0		Vel = 0.70	
519 to 520	18.76 18.76		3.61 38.03	4 4.26			10.500 10.500	120 0.0004	24.999 0.0		Vel = 0.77	
520 to 521	18.76 18.76		4.13 42.16	4 4.26			10.500 10.500	120 0.0005	25.004 0.0		Vel = 0.86	
521 to 522	18.76 18.76		4.70 46.86	4 4.26			10.500 10.500	120 0.0006	25.010 0.0		Vel = 0.95	
522 to 523	18.76 18.76		5.33 52.19	4 4.26			10.500 10.500	120 0.0007	25.017 0.0		Vel = 1.05	
523 to 524	18.76 18.76		6.01 58.2	4 4.26			10.500 10.500	120 0.0009	25.026 0.0		Vel = 1.17	
524 to 525	18.76 18.76		6.77 64.97	4 4.26	T	26.334	8.500 26.334 34.834	120 0.0010	25.036 0.0		Vel = 1.31	
525 to 526	18.76 16.58		158.34 223.31	6 6.357	E	17.603	180.010 17.603 197.613	120 0.0013	25.080 0.944 0.044		Vel = 1.46	
526 to TR5	16.58 16.41		0.0 223.31	6 6.357	6E	105.616	412.050 105.616 517.666	120 0.0017	26.369 0.074 0.904		Vel = 2.26	
TR5 to BR5	16.41 2.830		0.0 223.31	6 6.357	T G	37.72 3.772	13.570 41.492 55.062	120 0.0017	27.347 5.882 0.096		Vel = 2.26	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
BR5 to BR4	2.830 2.83		0.0 223.31	6 6.357			1.833 1.833	120 0.0016	33.325 0.0 0.003		Vel = 2.26	
BR4 to BR3	2.83 2.83		0.0 223.31	4 4.26			1.250 1.250	120 0.0128	33.328 0.0 0.016		Vel = 5.03	
BR3 to 127	2.83 2.792		0.0 223.31	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0123	33.344 0.016 0.362		Vel = 5.03	
127 to 128	2.792 2		0.0 223.31	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0018	33.722 0.343 0.035		Vel = 2.26	
128 to PO	2 1.080		0.0 223.31	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0005	34.100 0.398 0.142		Vel = 1.34	
PO			0.0 223.31						34.640		K Factor = 37.94	
System Demand Pressure									34.640			
Safety Margin									88.511			
Continuation Pressure									123.151			
Pressure @ Pump Outlet									123.151			
Pressure From Pump Curve									-88.681			
Pressure @ Pump Inlet									34.470			
PI to FLG	1.080 -5		0.0 223.31	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0005	34.470 2.633 0.068		Vel = 1.34	
FLG to TEST	-5 -2		0.0 223.31	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0004	37.171 5.259 0.083		* * Fixed Loss = 6.558 Vel = 1.33	
TEST			250.00 473.31						42.513		Qa = 250.00 K Factor = 72.59	
587 to 589	20.35 20.2		0.55 0.55	1.5 1.682			13.000 13.000	120 0.0001	18.080 0.065 0.001		Vel = 0.08	
589 to 590	20.2 20.04	13.13	55.92 56.47	1.5 1.682			12.500 12.500	120 0.0890	18.146 0.069 1.113		K = K @ EQ03 Vel = 8.15	
590 to 584	20.04 19.59		0.0 56.47	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0891	19.328 0.195 3.781		Vel = 8.15	
584 to 556	19.59 18.76		0.0 56.47	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0892	23.304 0.359 0.957		Vel = 8.15	
556 to 557	18.76 18.76		18.78 75.25	4 4.26			9.000 9.000	120 0.0016	24.620 0.0 0.014		Vel = 1.69	
557 to 558	18.76 18.76		56.49 131.74	4 4.26			6.170 6.170	120 0.0047	24.634 0.0 0.029		Vel = 2.97	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
558 to 559	18.76 18.76		6.00 137.74	4 4.26		10.500	120	24.663 0.0			
559 to 560	18.76 18.76		4.90 142.64	4 4.26		10.500	120	24.716 0.0	Vel =	3.10	
560 to 561	18.76 18.76		5.23 147.87	4 4.26		10.500	120	24.772 0.0	Vel =	3.33	
561 to 562	18.76 18.76		5.16 153.03	4 4.26		10.500	120	24.832 0.0	Vel =	3.44	
562 to 525	18.76 18.76		5.31 158.34	4 4.26	T 26.334	2.000 26.334 28.334	120	24.896 0.0	Vel =	3.56	
525			0.0 158.34					25.080	K Factor =	31.62	
548 to 549	21.03 21.03		18.78 18.78	3 3.26		10.000	120	23.408 0.0	Vel =	0.72	
549 to 550	21.03 21.03		-6.29 12.49	3 3.26		10.000	120	23.413 0.0	Vel =	0.48	
550 to 551	21.03 21.03		-6.25 6.24	3 3.26		9.000	120	23.415 0.0	Vel =	0.24	
551 to 552	21.03 19.59		0.0 6.24	1.5 1.682	T E 9.9 4.95	119.000 14.850 133.850	120	23.416 0.624	Vel =	0.90	
552 to 553	19.59 18.76		0.0 6.24	1.5 1.682	T 9.9	0.830 9.900 10.730	120	24.242 0.359	Vel =	0.90	
553 to 554	18.76 18.76		0.0 6.24	4 4.26		9.000	120	24.618 0.0	Vel =	0.14	
554 to 555	18.76 18.76		6.25 12.49	4 4.26		10.000	120	24.618 0.0	Vel =	0.28	
555 to 556	18.76 18.76		6.29 18.78	4 4.26		10.000	120	24.618 0.0	Vel =	0.42	
556			0.0 18.78					24.620	K Factor =	3.78	
549 to 591	21.03 20.04		6.29 6.29	1.5 1.682	T 9.9	81.500 9.900 91.400	120	23.413 0.429	Vel =	0.91	
591 to 585	20.04 19.59		0.0 6.29	1.5 1.682	E 4.95	37.500 4.950 42.450	120	23.982 0.195	Vel =	0.91	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
585 to 555	19.59 18.76		0.0 6.29	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0016	24.242 0.359 0.017		Vel = 0.91	
555			0.0 6.29						24.618		K Factor = 1.27	
550 to 586	21.03 19.59		6.25 6.25	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0015	23.415 0.624 0.203		Vel = 0.90	
586 to 554	19.59 18.76		0.0 6.25	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0016	24.242 0.359 0.017		Vel = 0.90	
554			0.0 6.25						24.618		K Factor = 1.26	
547 to 592	21.03 20.49		-55.19 -55.19	1.5 1.682	T	9.9	45.000 9.900 54.900	120 -0.0854	23.422 0.234 -4.686		Vel = 7.97	
592 to 593	20.49 20.35		0.0 -55.19	1.5 1.682			11.000 11.000	120 -0.0854	18.970 0.061 -0.939		Vel = 7.97	
593 to 594	20.35 20.2	13.1	55.74 0.55	1.5 1.682			13.000 13.000	120 0	18.092 0.065 0.0		K = K @ EQ02 Vel = 0.08	
594 to 595	20.2 20.04	13.13	55.94 56.49	1.5 1.682			12.500 12.500	120 0.0891	18.157 0.069 1.114		K = K @ EQ03 Vel = 8.16	
595 to 583	20.04 19.59		0.0 56.49	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0891	19.340 0.195 3.783		Vel = 8.16	
583 to 557	19.59 18.76		0.0 56.49	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0892	23.318 0.359 0.957		Vel = 8.16	
557			0.0 56.49						24.634		K Factor = 11.38	
546 to 582	21.03 19.59		6.00 6.0	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0014	23.476 0.624 0.188		Vel = 0.87	
582 to 558	19.59 18.76		0.0 6.0	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0015	24.288 0.359 0.016		Vel = 0.87	
558			0.0 6.00						24.663		K Factor = 1.21	
545 to 581	21.03 19.59		4.91 4.91	1.5 1.682	T 3E	9.9 14.849	122.010 24.749 146.759	120 0.0010	23.580 0.624 0.142		Vel = 0.71	
581 to 559	19.59 18.76		0.0 4.91	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0010	24.346 0.359 0.011		Vel = 0.71	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
559			0.0 4.91						24.716		K Factor = 0.99	
544 to 580	21.03 19.59		5.23	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	23.631 0.624 0.145		Vel = 0.76	
580 to 560	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	24.400 0.359 0.013		Vel = 0.76	
560			0.0 5.23						24.772		K Factor = 1.05	
543 to 579	21.03 19.59		5.16	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	23.695 0.624 0.142		Vel = 0.75	
579 to 561	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	24.461 0.359 0.012		Vel = 0.75	
561			0.0 5.16						24.832		K Factor = 1.04	
542 to 578	21.03 19.59		5.31	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	23.750 0.624 0.150		Vel = 0.77	
578 to 562	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	24.524 0.359 0.013		Vel = 0.77	
562			0.0 5.31						24.896		K Factor = 1.06	
541 to 577	21.03 19.59		6.77	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	23.799 0.624 0.235		Vel = 0.98	
577 to 524	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	24.658 0.359 0.019		Vel = 0.98	
524			0.0 6.77						25.036		K Factor = 1.35	
540 to 576	21.03 19.59		6.01	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	23.838 0.624 0.189		Vel = 0.87	
576 to 523	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	24.651 0.359 0.016		Vel = 0.87	
523			0.0 6.01						25.026		K Factor = 1.20	
539 to 575	21.03 19.59		5.33	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	23.870 0.624 0.151		Vel = 0.77	
575 to 522	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	24.645 0.359 0.013		Vel = 0.77	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
522			0.0 5.33						25.017		K Factor = 1.07	
538 to 574	21.03 19.59		4.70 4.7	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0009	23.897 0.624 0.120		Vel = 0.68	
574 to 521	19.59 18.76		0.0 4.7	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0009	24.641 0.359 0.010		Vel = 0.68	
521			0.0 4.70						25.010		K Factor = 0.94	
537 to 573	21.03 19.59		4.13 4.13	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0007	23.918 0.624 0.095		Vel = 0.60	
573 to 520	19.59 18.76		0.0 4.13	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0007	24.637 0.359 0.008		Vel = 0.60	
520			0.0 4.13						25.004		K Factor = 0.83	
536 to 572	21.03 19.59		3.61 3.61	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0006	23.936 0.624 0.074		Vel = 0.52	
572 to 519	19.59 18.76		0.0 3.61	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0006	24.634 0.359 0.006		Vel = 0.52	
519			0.0 3.61						24.999		K Factor = 0.72	
535 to 604	21.03 20.2		3.11 3.11	1.5 1.682	T	9.9	68.500 9.900 78.400	120 0.0004	23.951 0.359 0.034		Vel = 0.45	
604 to 571	20.2 19.59		0.0 3.11	1.5 1.682	E	4.95	50.510 4.950 55.460	120 0.0004	24.344 0.264 0.023		Vel = 0.45	
571 to 518	19.59 18.76		0.0 3.11	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	24.631 0.359 0.005		Vel = 0.45	
518			0.0 3.11						24.995		K Factor = 0.62	
534 to 600	21.03 20.56		2.64 2.64	1.5 1.682	T	9.9	38.500 9.900 48.400	120 0.0003	23.964 0.204 0.014		Vel = 0.38	
600 to 601	20.56 20.47		0.0 2.64	1.5 1.682			8.000 8.000	120 0.0004	24.182 0.039 0.003		Vel = 0.38	
601 to 602	20.47 20.33		0.0 2.64	1.5 1.682			11.000 11.000	120 0.0003	24.224 0.061 0.003		Vel = 0.38	
602 to 603	20.33 20.2		0.0 2.64	1.5 1.682			11.000 11.000	120 0.0004	24.288 0.056 0.004		Vel = 0.38	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
603 to 570	20.2 19.59		0.0 2.64	1.5 1.682	E	4.95	50.510 4.950 55.460	120 0.0003	24.348 0.264 0.017		Vel = 0.38	
570 to 517	19.59 18.76		0.0 2.64	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0004	24.629 0.359 0.004		Vel = 0.38	
517			0.0 2.64						24.992		K Factor = 0.53	
533 to 597	21.03 20.56		2.17 2.17	1.5 1.682	T	9.9	38.500 9.900 48.400	120 0.0002	23.974 0.204 0.010		Vel = 0.31	
597 to 596	20.56 20.47		0.0 2.17	1.5 1.682			8.000 8.000	120 0.0002	24.188 0.039 0.002		Vel = 0.31	
596 to 598	20.47 20.33		0.0 2.17	1.5 1.682			11.000 11.000	120 0.0002	24.229 0.061 0.002		Vel = 0.31	
598 to 599	20.33 20.2		0.0 2.17	1.5 1.682			11.000 11.000	120 0.0003	24.292 0.056 0.003		Vel = 0.31	
599 to 569	20.2 19.59		0.0 2.17	1.5 1.682	E	4.95	50.510 4.950 55.460	120 0.0002	24.351 0.264 0.012		Vel = 0.31	
569 to 516	19.59 18.76		0.0 2.17	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0003	24.627 0.359 0.003		Vel = 0.31	
516			0.0 2.17						24.989		K Factor = 0.43	
532 to 515	21.03 19.59		8.10 8.1	3 3.26	2T	40.319	119.000 40.319 159.319	120 0.0001	23.982 0.624 0.015		Vel = 0.31	
515			0.0 8.10						24.621		K Factor = 1.63	
531 to 514	21.03 19.59		6.72 6.72	3 3.26	2T	40.319	119.000 40.319 159.319	120 0.0001	23.985 0.624 0.011		Vel = 0.26	
514			0.0 6.72						24.620		K Factor = 1.35	
530 to 565	21.03 20.19		5.95 5.95	3 3.26	T	20.159	69.490 20.159 89.649	120 0.0001	23.987 0.364 0.005		Vel = 0.23	
565 to 566	20.19 20.06		0.0 5.95	3 3.26			11.000 11.000	120 0	24.356 0.056 0.0		Vel = 0.23	
566 to 567	20.06 19.92		0.0 5.95	3 3.26			11.000 11.000	120 0.0001	24.412 0.061 0.001		Vel = 0.23	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
567 to 605	19.92 19.78		0.0 5.95	3 3.26			12.000 12.000	120 0	24.474 0.061 0.0		Vel = 0.23	
605 to 513	19.78 19.59		0.0 5.95	3 3.26	T	20.159	15.590 20.159 35.749	120 0.0001	24.535 0.082 0.002		Vel = 0.23	
513			0.0 5.95						24.619		K Factor = 1.20	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS5 GM SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

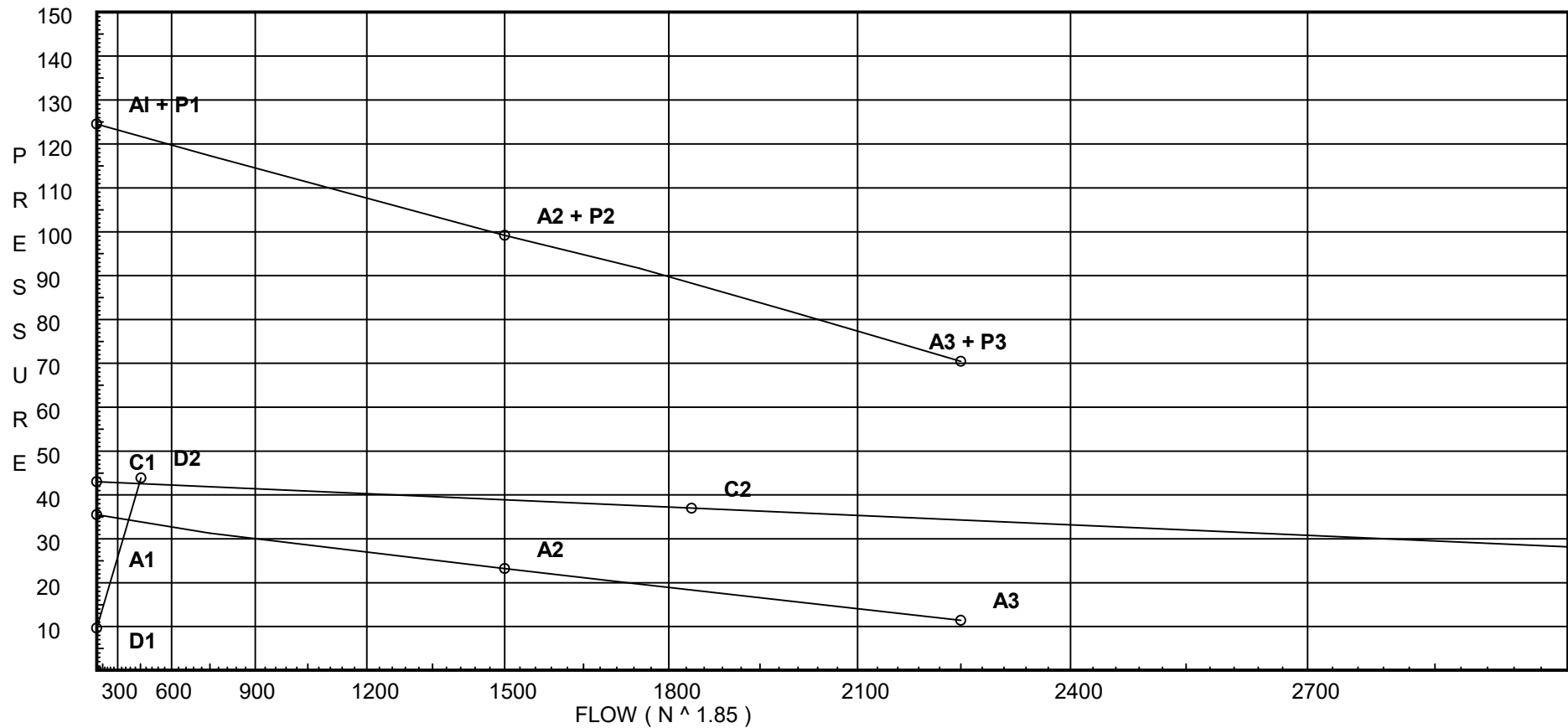
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.680
D2 - System Flow : 453.093
D2 - System Pressure : 43.893
Hose (Demand) :
D3 - System Demand : 453.093
Hose (Adj City) : 250
Safety Margin : 77.021



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.914	453.09	43.893
TEST	43.0	37	1839.0	41.987	703.09	41.987

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	14.0	16.8	8.0	47.52	0.01	130
EQ02	20.35		12.57			
DP01	14.0	16.8	8.0	47.52	0.01	130
EQ01	20.49		12.6			
DP04	14.0	16.8	8.0	47.52	0.01	130
EQ04	20.04		12.51			
DP03	14.0	16.8	8.0	47.52	0.01	130
EQ03	20.2		12.54			
587	20.35	13.4	12.57	47.52	K=K @ EQ02	
588	20.49	13.39	13.18	48.59	K=K @ EQ01	
548	21.03		25.6			
547	21.03		25.68			
546	21.03		25.89			
545	21.03		26.27			
544	21.03		26.47			
543	21.03		26.71			
542	21.03		26.92			
541	21.03		27.1			
540	21.03		27.24			
539	21.03		27.36			
538	21.03		27.46			
537	21.03		27.54			
536	21.03		27.61			
535	21.03		27.66			
534	21.03		27.71			
533	21.03		27.75			
532	21.03		27.78			
531	21.03		27.79			
530	21.03		27.8			
568	21.03		27.8			
527	20.13		28.21			
528	20.06		28.24			
529	19.92		28.3			
564	19.78		28.36			
563	19.59		28.45			
513	19.59		28.45			
514	19.59		28.46			
515	19.59		28.46			
516	18.76		28.85			
517	18.76		28.86			
518	18.76		28.87			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
519	18.76		28.89		
520	18.76		28.91		
521	18.76		28.93		
522	18.76		28.96		
523	18.76		28.99		
524	18.76		29.03		
525	18.76		29.19		
526	16.58		31.41		
TR5	16.41		34.84		
BR5	2.83		41.07		
BR4	2.83		41.08		
BR3	2.83		41.14		
127	2.792		42.5		
128	2.0		42.97		
PO	1.08		43.89		
PI	1.08		33.1		
FLG	-5.0		35.98		
TEST	-2.0		41.99	250.0	
589	20.2	13.42	12.64	47.7	K=K @ EQ03
590	20.04	13.44	13.58	49.51	K=K @ EQ04
584	19.59		24.43		
556	18.76		27.49		
557	18.76		27.55		
558	18.76		27.66		
559	18.76		27.85		
560	18.76		28.06		
561	18.76		28.28		
562	18.76		28.51		
549	21.03		25.6		
550	21.03		25.61		
551	21.03		25.62		
552	19.59		27.05		
553	18.76		27.47		
554	18.76		27.47		
555	18.76		27.47		
591	20.04	13.44	24.26	66.17	K=K @ EQ04
585	19.59		26.58		
586	19.59		27.05		
592	20.49	13.39	13.22	48.66	K=K @ EQ01
593	20.35	13.4	12.61	47.59	K=K @ EQ02
594	20.2	13.42	12.68	47.77	K=K @ EQ03
595	20.04	13.44	13.61	49.58	K=K @ EQ04
583	19.59		24.49		
582	19.59		27.24		
581	19.59		27.45		
580	19.59		27.65		
579	19.59		27.87		
578	19.59		28.11		
577	19.59		28.6		
576	19.59		28.57		
575	19.59		28.55		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
574	19.59		28.53		
573	19.59		28.52		
572	19.59		28.51		
604	20.2		28.15		
571	19.59		28.5		
600	20.56		27.97		
601	20.47		28.02		
602	20.33		28.09		
603	20.2		28.16		
570	19.59		28.49		
597	20.56		27.99		
596	20.47		28.04		
598	20.33		28.11		
599	20.2		28.17		
569	19.59		28.48		
565	20.19		28.18		
566	20.06		28.24		
567	19.92		28.3		
605	19.78		28.36		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
DP02 to EQ02	14 20.35	16.80	47.52 47.52	1 1.049	T 5.0	6.350 5.000 11.350	120 0.6451	8.000 -2.750 7.322		Vel = 17.64	
EQ02			0.0 47.52					12.572		K Factor = 13.40	
DP01 to EQ01	14 20.49	16.80	47.52 47.52	1 1.049	T 5.0	6.490 5.000 11.490	120 0.6452	8.000 -2.811 7.413		Vel = 17.64	
EQ01			0.0 47.52					12.602		K Factor = 13.39	
DP04 to EQ04	14 20.04	16.80	47.52 47.52	1 1.049	T 5.0	6.040 5.000 11.040	120 0.6451	8.000 -2.616 7.122		Vel = 17.64	
EQ04			0.0 47.52					12.506		K Factor = 13.44	
DP03 to EQ03	14 20.2	16.80	47.52 47.52	1 1.049	T 5.0	6.200 5.000 11.200	120 0.6451	8.000 -2.685 7.225		Vel = 17.64	
EQ03			0.0 47.52					12.540		K Factor = 13.42	
587 to 588	20.35 20.49	13.4	45.84 45.84	1.5 1.682		11.000 11.000	120 0.0606	12.572 -0.061 0.667		K = K @ EQ02 Vel = 6.62	
588 to 548	20.49 21.03	13.39	48.59 94.43	1.5 1.682	T 9.9	45.000 9.900 54.900	120 0.2306	13.178 -0.234 12.660		K = K @ EQ01 Vel = 13.63	
548 to 547	21.03 21.03		-1.56 92.87	3 3.26		9.000 9.000	120 0.0089	25.604 0.0 0.080		Vel = 3.57	
547 to 546	21.03 21.03		94.60 187.47	3 3.26		6.170 6.170	120 0.0327	25.684 0.0 0.202		Vel = 7.21	
546 to 545	21.03 21.03		-12.46 175.01	3 3.26		13.500 13.500	120 0.0287	25.886 0.0 0.388		Vel = 6.73	
545 to 544	21.03 21.03		-10.19 164.82	3 3.26		7.500 7.500	120 0.0257	26.274 0.0 0.193		Vel = 6.34	
544 to 543	21.03 21.03		-10.81 154.01	3 3.26		10.500 10.500	120 0.0228	26.467 0.0 0.239		Vel = 5.92	
543 to 542	21.03 21.03		-10.64 143.37	3 3.26		10.500 10.500	120 0.0199	26.706 0.0 0.209		Vel = 5.51	
542 to 541	21.03 21.03		-10.90 132.47	3 3.26		10.500 10.500	120 0.0171	26.915 0.0 0.180		Vel = 5.09	
541 to 540	21.03 21.03		-13.81 118.66	3 3.26		10.500 10.500	120 0.0140	27.095 0.0 0.147		Vel = 4.56	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
540 to 539	21.03 21.03		-12.25 106.41	3 3.26			10.500 10.500	120 0.0115	27.242 0.0 0.121		Vel = 4.09	
539 to 538	21.03 21.03		-10.86 95.55	3 3.26			10.500 10.500	120 0.0093	27.363 0.0 0.098		Vel = 3.67	
538 to 537	21.03 21.03		-9.59 85.96	3 3.26			10.500 10.500	120 0.0077	27.461 0.0 0.081		Vel = 3.30	
537 to 536	21.03 21.03		-8.43 77.53	3 3.26			10.500 10.500	120 0.0064	27.542 0.0 0.067		Vel = 2.98	
536 to 535	21.03 21.03		-7.35 70.18	3 3.26			10.500 10.500	120 0.0053	27.609 0.0 0.056		Vel = 2.70	
535 to 534	21.03 21.03		-6.35 63.83	3 3.26			10.500 10.500	120 0.0045	27.665 0.0 0.047		Vel = 2.45	
534 to 533	21.03 21.03		-5.37 58.46	3 3.26			10.500 10.500	120 0.0038	27.712 0.0 0.040		Vel = 2.25	
533 to 532	21.03 21.03		-4.42 54.04	3 3.26			8.000 8.000	120 0.0032	27.752 0.0 0.026		Vel = 2.08	
532 to 531	21.03 21.03		-16.51 37.53	3 3.26			8.000 8.000	120 0.0016	27.778 0.0 0.013		Vel = 1.44	
531 to 530	21.03 21.03		-13.70 23.83	3 3.26			9.000 9.000	120 0.0007	27.791 0.0 0.006		Vel = 0.92	
530 to 568	21.03 21.03		-12.14 11.69	3 3.26			9.000 9.000	120 0.0002	27.797 0.0 0.002		Vel = 0.45	
568 to 527	21.03 20.13		0.0 11.69	3 3.26	T	20.159	74.490 20.159 94.649	120 0.0002	27.799 0.390 0.018		Vel = 0.45	
527 to 528	20.13 20.06		0.0 11.69	3 3.26			6.000 6.000	120 0.0003	28.207 0.030 0.002		Vel = 0.45	
528 to 529	20.06 19.92		0.0 11.69	3 3.26			11.000 11.000	120 0.0001	28.239 0.061 0.001		Vel = 0.45	
529 to 564	19.92 19.78		0.0 11.69	3 3.26			12.000 12.000	120 0.0002	28.301 0.061 0.002		Vel = 0.45	
564 to 563	19.78 19.59		0.0 11.69	3 3.26	T	20.159	15.510 20.159 35.669	120 0.0002	28.364 0.082 0.008		Vel = 0.45	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
563 to 513	19.59 19.59		0.0 11.69	4 4.26			9.000 9.000	120 0	28.454 0.0			
513 to 514	19.59 19.59		12.14 23.83	4 4.26			9.000 9.000	120 0.0002	28.454 0.002		Vel = 0.26	
514 to 515	19.59 19.59		13.70 37.53	4 4.26			8.000 8.000	120 0.0004	28.456 0.003		Vel = 0.54	
515 to 516	19.59 18.76		16.51 54.04	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0009	28.459 0.359 0.032		Vel = 0.84	
516 to 517	18.76 18.76		4.42 58.46	4 4.26			10.500 10.500	120 0.0010	28.850 0.011		Vel = 1.22	
517 to 518	18.76 18.76		5.37 63.83	4 4.26			10.500 10.500	120 0.0012	28.861 0.013		Vel = 1.32	
518 to 519	18.76 18.76		6.35 70.18	4 4.26			10.500 10.500	120 0.0014	28.874 0.015		Vel = 1.44	
519 to 520	18.76 18.76		7.35 77.53	4 4.26			10.500 10.500	120 0.0017	28.889 0.018		Vel = 1.58	
520 to 521	18.76 18.76		8.43 85.96	4 4.26			10.500 10.500	120 0.0021	28.907 0.022		Vel = 1.75	
521 to 522	18.76 18.76		9.59 95.55	4 4.26			10.500 10.500	120 0.0026	28.929 0.027		Vel = 1.93	
522 to 523	18.76 18.76		10.86 106.41	4 4.26			10.500 10.500	120 0.0030	28.956 0.032		Vel = 2.15	
523 to 524	18.76 18.76		12.25 118.66	4 4.26			10.500 10.500	120 0.0038	28.988 0.040		Vel = 2.40	
524 to 525	18.76 18.76		13.81 132.47	4 4.26	T	26.334	8.500 26.334 34.834	120 0.0047	29.028 0.0 0.163		Vel = 2.67	
525 to 526	18.76 16.58		320.62 453.09	6 6.357	E	17.603	180.010 17.603 197.613	120 0.0065	29.191 0.944 1.279		Vel = 2.98	
526 to TR5	16.58 16.41		0.0 453.09	6 6.357	6E	105.616	412.050 105.616 517.666	120 0.0065	31.414 0.074 3.347		Vel = 4.58	
TR5 to BR5	16.41 2.830		0.0 453.09	6 6.357	T G	37.72 3.772	13.570 41.492 55.062	120 0.0065	34.835 5.882 0.356		Vel = 4.58	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
BR5 to BR4	2.830 2.83		0.0 453.09	6 6.357			1.833 1.833	120 0.0065	41.073 0.0 0.012		Vel = 4.58	
BR4 to BR3	2.83 2.83		0.0 453.09	4 4.26			1.250 1.250	120 0.0456	41.085 0.0 0.057		Vel = 10.20	
BR3 to 127	2.83 2.792		0.0 453.09	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0454	41.142 0.016 1.340		Vel = 10.20	
127 to 128	2.792 2		0.0 453.09	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0065	42.498 0.343 0.130		Vel = 4.58	
128 to PO	2 1.080		0.0 453.09	8 8.249	7E T S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0018	42.971 0.398 0.524		Vel = 2.72	
PO			0.0 453.09						43.893		K Factor = 68.39	
System Demand Pressure									43.893			
Safety Margin									77.021			
Continuation Pressure									120.914			
Pressure @ Pump Outlet									120.914			
Pressure From Pump Curve									-87.819			
Pressure @ Pump Inlet									33.095			
PI to FLG	1.080 -5		0.0 453.09	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0018	33.095 2.633 0.253		Vel = 2.72	
FLG to TEST	-5 -2		0.0 453.09	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0013	35.981 5.701 0.305		* * Fixed Loss = 7 Vel = 2.71	
TEST			250.00 703.09						41.987		Qa = 250.00 K Factor = 108.51	
587 to 589	20.35 20.2		1.68 1.68	1.5 1.682			13.000 13.000	120 0.0002	12.572 0.065 0.002		Vel = 0.24	
589 to 590	20.2 20.04	13.42	47.70 49.38	1.5 1.682			12.500 12.500	120 0.0695	12.639 0.069 0.869		K = K @ EQ03 Vel = 7.13	
590 to 584	20.04 19.59	13.44	49.51 98.89	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.2511	13.577 0.195 10.660		K = K @ EQ04 Vel = 14.28	
584 to 556	19.59 18.76		0.0 98.89	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.2512	24.432 0.359 2.695		Vel = 14.28	
556 to 557	18.76 18.76		67.74 166.63	4 4.26			9.000 9.000	120 0.0072	27.486 0.0 0.065		Vel = 3.75	
557 to 558	18.76 18.76		98.99 265.62	4 4.26			6.170 6.170	120 0.0169	27.551 0.0 0.104		Vel = 5.98	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
558 to 559	18.76 18.76		12.46 278.08	4 4.26			10.500 10.500	120 0.0184	27.655 0.0 0.193		Vel = 6.26	
559 to 560	18.76 18.76		10.19 288.27	4 4.26			10.500 10.500	120 0.0197	27.848 0.0 0.207		Vel = 6.49	
560 to 561	18.76 18.76		10.81 299.08	4 4.26			10.500 10.500	120 0.0210	28.055 0.0 0.221		Vel = 6.73	
561 to 562	18.76 18.76		10.64 309.72	4 4.26			10.500 10.500	120 0.0225	28.276 0.0 0.236		Vel = 6.97	
562 to 525	18.76 18.76		10.91 320.63	4 4.26	T	26.334	2.000 26.334 28.334	120 0.0240	28.512 0.0 0.679		Vel = 7.22	
525			0.0 320.63						29.191		K Factor = 59.34	
548 to 549	21.03 21.03		1.56 1.56	3 3.26			10.000 10.000	120 0	25.604 0.0 0.0		Vel = 0.06	
549 to 550	21.03 21.03		24.81 26.37	3 3.26			10.000 10.000	120 0.0009	25.604 0.0 0.009		Vel = 1.01	
550 to 551	21.03 21.03		-13.19 13.18	3 3.26			9.000 9.000	120 0.0002	25.613 0.0 0.002		Vel = 0.51	
551 to 552	21.03 19.59		0.0 13.18	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0060	25.615 0.624 0.807		Vel = 1.90	
552 to 553	19.59 18.76		0.0 13.18	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0061	27.046 0.359 0.065		Vel = 1.90	
553 to 554	18.76 18.76		0.0 13.18	4 4.26			9.000 9.000	120 0	27.470 0.0 0.0		Vel = 0.30	
554 to 555	18.76 18.76		13.19 26.37	4 4.26			10.000 10.000	120 0.0003	27.470 0.0 0.003		Vel = 0.59	
555 to 556	18.76 18.76		41.37 67.74	4 4.26			10.000 10.000	120 0.0013	27.473 0.0 0.013		Vel = 1.52	
556			0.0 67.74						27.486		K Factor = 12.92	
549 to 591	21.03 20.04		-24.81 -24.81	1.5 1.682	T	9.9	81.500 9.900 91.400	120 -0.0195	25.604 0.429 -1.778		Vel = 3.58	
591 to 585	20.04 19.59	13.44	66.18 41.37	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0501	24.255 0.195 2.126		K = K @ EQ04 Vel = 5.97	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
585 to 555	19.59 18.76		0.0 41.37	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0501	26.576 0.359 0.538		Vel = 5.97	
555			0.0 41.37						27.473		K Factor = 7.89	
550 to 586	21.03 19.59		13.20 13.2	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0060	25.613 0.624 0.809		Vel = 1.91	
586 to 554	19.59 18.76		0.0 13.2	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0061	27.046 0.359 0.065		Vel = 1.91	
554			0.0 13.20						27.470		K Factor = 2.52	
547 to 592	21.03 20.49		-94.60 -94.6	1.5 1.682	T	9.9	45.000 9.900 54.900	120 -0.2314	25.684 0.234 -12.702		Vel = 13.66	
592 to 593	20.49 20.35	13.39	48.66 -45.94	1.5 1.682			11.000 11.000	120 -0.0608	13.216 0.061 -0.669		K = K @ EQ01 Vel = 6.63	
593 to 594	20.35 20.2	13.4	47.59 1.65	1.5 1.682			13.000 13.000	120 0.0002	12.608 0.065 0.002		K = K @ EQ02 Vel = 0.24	
594 to 595	20.2 20.04	13.42	47.77 49.42	1.5 1.682			12.500 12.500	120 0.0696	12.675 0.069 0.870		K = K @ EQ03 Vel = 7.14	
595 to 583	20.04 19.59	13.44	49.58 99.0	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.2516	13.614 0.195 10.682		K = K @ EQ04 Vel = 14.29	
583 to 557	19.59 18.76		0.0 99.0	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.2517	24.491 0.359 2.701		Vel = 14.29	
557			0.0 99.00						27.551		K Factor = 18.86	
546 to 582	21.03 19.59		12.46 12.46	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0054	25.886 0.624 0.727		Vel = 1.80	
582 to 558	19.59 18.76		0.0 12.46	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0055	27.237 0.359 0.059		Vel = 1.80	
558			0.0 12.46						27.655		K Factor = 2.37	
545 to 581	21.03 19.59		10.20 10.2	1.5 1.682	T 3E	9.9 14.849	122.010 24.749 146.759	120 0.0038	26.274 0.624 0.551		Vel = 1.47	
581 to 559	19.59 18.76		0.0 10.2	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0037	27.449 0.359 0.040		Vel = 1.47	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
559			0.0 10.20						27.848		K Factor = 1.93	
544 to 580	21.03 19.59		10.81	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	26.467 0.624 0.560		Vel = 1.56	
580 to 560	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	27.651 0.359 0.045		Vel = 1.56	
560			0.0 10.81						28.055		K Factor = 2.04	
543 to 579	21.03 19.59		10.64	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	26.706 0.624 0.543		Vel = 1.54	
579 to 561	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	27.873 0.359 0.044		Vel = 1.54	
561			0.0 10.64						28.276		K Factor = 2.00	
542 to 578	21.03 19.59		10.90	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	26.915 0.624 0.568		Vel = 1.57	
578 to 562	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	28.107 0.359 0.046		Vel = 1.57	
562			0.0 10.90						28.512		K Factor = 2.04	
541 to 577	21.03 19.59		13.80	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	27.095 0.624 0.879		Vel = 1.99	
577 to 524	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	28.598 0.359 0.071		Vel = 1.99	
524			0.0 13.80						29.028		K Factor = 2.56	
540 to 576	21.03 19.59		12.26	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	27.242 0.624 0.706		Vel = 1.77	
576 to 523	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	28.572 0.359 0.057		Vel = 1.77	
523			0.0 12.26						28.988		K Factor = 2.28	
539 to 575	21.03 19.59		10.86	1.5	T E	9.9 4.95	119.010 14.850 133.860	120	27.363 0.624 0.564		Vel = 1.57	
575 to 522	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900 10.730	120	28.551 0.359 0.046		Vel = 1.57	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
522			0.0 10.86						28.956		K Factor = 2.02	
538 to 574	21.03 19.59		9.59 9.59	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0034	27.461 0.624 0.449		Vel = 1.38	
574 to 521	19.59 18.76		0.0 9.59	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0034	28.534 0.359 0.036		Vel = 1.38	
521			0.0 9.59						28.929		K Factor = 1.78	
537 to 573	21.03 19.59		8.43 8.43	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0026	27.542 0.624 0.353		Vel = 1.22	
573 to 520	19.59 18.76		0.0 8.43	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0027	28.519 0.359 0.029		Vel = 1.22	
520			0.0 8.43						28.907		K Factor = 1.57	
536 to 572	21.03 19.59		7.35 7.35	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0020	27.609 0.624 0.274		Vel = 1.06	
572 to 519	19.59 18.76		0.0 7.35	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0021	28.507 0.359 0.023		Vel = 1.06	
519			0.0 7.35						28.889		K Factor = 1.37	
535 to 604	21.03 20.2		6.34 6.34	1.5 1.682	T	9.9	68.500 9.900 78.400	120 0.0016	27.665 0.359 0.123		Vel = 0.92	
604 to 571	20.2 19.59		0.0 6.34	1.5 1.682	E	4.95	50.510 4.950 55.460	120 0.0016	28.147 0.264 0.086		Vel = 0.92	
571 to 518	19.59 18.76		0.0 6.34	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0017	28.497 0.359 0.018		Vel = 0.92	
518			0.0 6.34						28.874		K Factor = 1.18	
534 to 600	21.03 20.56		5.38 5.38	1.5 1.682	T	9.9	38.500 9.900 48.400	120 0.0011	27.712 0.204 0.055		Vel = 0.78	
600 to 601	20.56 20.47		0.0 5.38	1.5 1.682			8.000 8.000	120 0.0011	27.971 0.039 0.009		Vel = 0.78	
601 to 602	20.47 20.33		0.0 5.38	1.5 1.682			11.000 11.000	120 0.0011	28.019 0.061 0.012		Vel = 0.78	
602 to 603	20.33 20.2		0.0 5.38	1.5 1.682			11.000 11.000	120 0.0012	28.092 0.056 0.013		Vel = 0.78	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
603 to 570	20.2 19.59		0.0 5.38	1.5 1.682	E 9.9	4.95 50.510 4.950 55.460	120 0.0012	28.161 0.264 0.064		Vel = 0.78	
570 to 517	19.59 18.76		0.0 5.38	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0012	28.489 0.359 0.013		Vel = 0.78	
517			0.0 5.38					28.861		K Factor = 1.00	
533 to 597	21.03 20.56		4.42 4.42	1.5 1.682	T 9.9	38.500 9.900 48.400	120 0.0008	27.752 0.204 0.038		Vel = 0.64	
597 to 596	20.56 20.47		0.0 4.42	1.5 1.682		8.000 8.000	120 0.0008	27.994 0.039 0.006		Vel = 0.64	
596 to 598	20.47 20.33		0.0 4.42	1.5 1.682		11.000 11.000	120 0.0007	28.039 0.061 0.008		Vel = 0.64	
598 to 599	20.33 20.2		0.0 4.42	1.5 1.682		11.000 11.000	120 0.0009	28.108 0.056 0.010		Vel = 0.64	
599 to 569	20.2 19.59		0.0 4.42	1.5 1.682	E 4.95	50.510 4.950 55.460	120 0.0008	28.174 0.264 0.044		Vel = 0.64	
569 to 516	19.59 18.76		0.0 4.42	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0008	28.482 0.359 0.009		Vel = 0.64	
516			0.0 4.42					28.850		K Factor = 0.82	
532 to 515	21.03 19.59		16.51 16.51	3 3.26	2T 40.319	119.000 40.319 159.319	120 0.0004	27.778 0.624 0.057		Vel = 0.63	
515			0.0 16.51					28.459		K Factor = 3.09	
531 to 514	21.03 19.59		13.70 13.7	3 3.26	2T 40.319	119.000 40.319 159.319	120 0.0003	27.791 0.624 0.041		Vel = 0.53	
514			0.0 13.70					28.456		K Factor = 2.57	
530 to 565	21.03 20.19		12.14 12.14	3 3.26	T 20.159	69.490 20.159 89.649	120 0.0002	27.797 0.364 0.019		Vel = 0.47	
565 to 566	20.19 20.06		0.0 12.14	3 3.26		11.000 11.000	120 0.0002	28.180 0.056 0.002		Vel = 0.47	
566 to 567	20.06 19.92		0.0 12.14	3 3.26		11.000 11.000	120 0.0002	28.238 0.061 0.002		Vel = 0.47	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
567 to 605	19.92 19.78		0.0 12.14	3 3.26			12.000 12.000	120 0.0002	28.301 0.061 0.002		Vel = 0.47	
605 to 513	19.78 19.59		0.0 12.14	3 3.26	T	20.159	15.590 20.159 35.749	120 0.0002	28.364 0.082 0.008		Vel = 0.47	
513			0.0 12.14						28.454		K Factor = 2.28	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 16
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
588	548	45.000	590	584	37.500
547	592	45.000	595	583	37.500

Flow		Safety		Pressure
Required		Margin		Differential
Left	11.000	702.515	77.267	-0.246
Area Calculated		703.093	77.021	0.000
Right	11.000	703.278	77.445	-0.424

Typical Distance Between Heads = 11.000
Split Point Used in Worst Area Peaked = 587



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS5 GR SALES 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

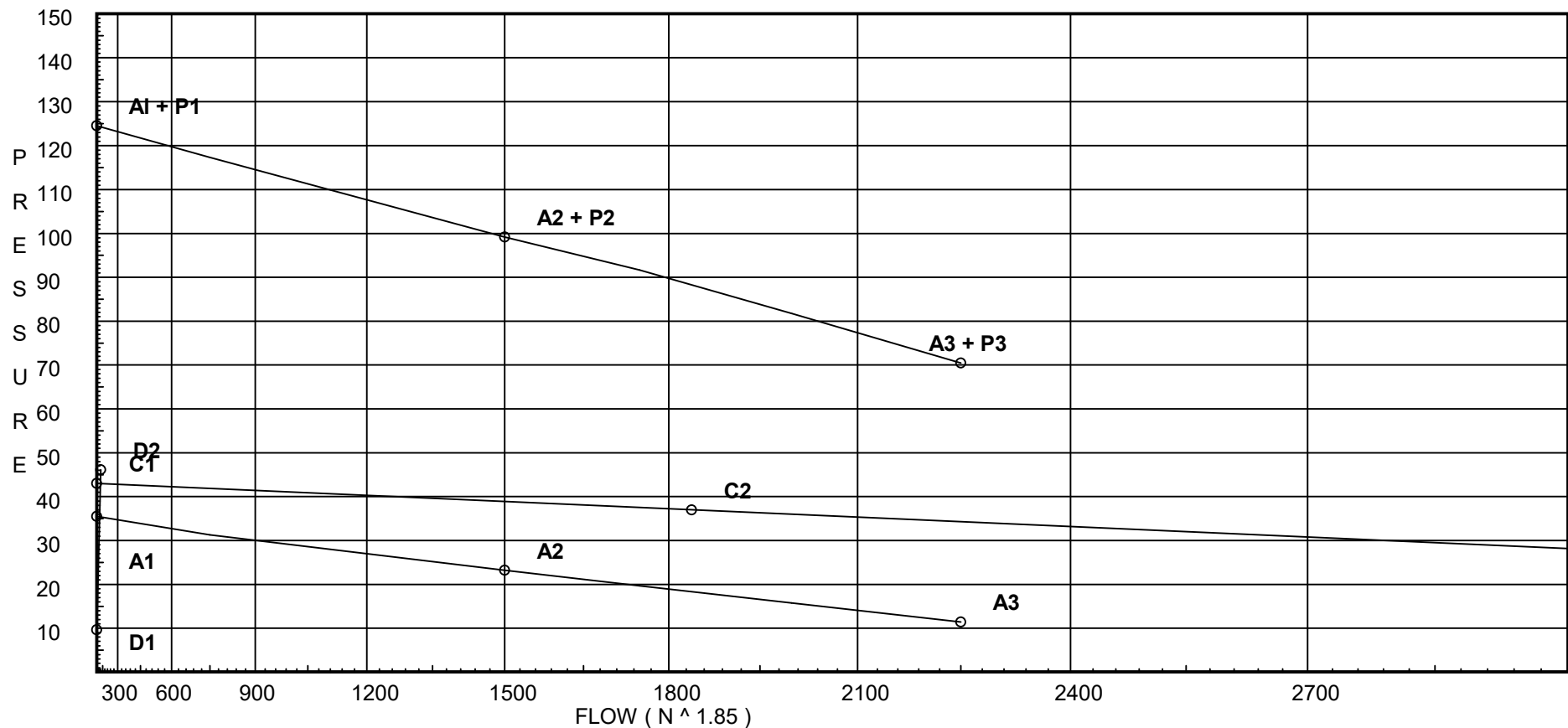
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.671
D2 - System Flow : 122.747
D2 - System Pressure : 46.164
Hose (Demand) :
D3 - System Demand : 122.747
Hose (Adj City) : 250
Safety Margin : 77.727



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.891	122.75	46.164
TEST	43.0	37	1839.0	42.687	372.75	42.687

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>	
596	20.33	11.2	30.0	61.34	0.01	130
597	20.47		31.07			
533	21.03		36.63			
532	21.03		36.63			
531	21.03		36.64			
530	21.03		36.64			
568	21.03		36.64			
527	20.13		37.03			
528	20.06		37.06			
529	19.92		37.12			
564	19.78		37.18			
563	19.59		37.26			
513	19.59		37.26			
514	19.59		37.26			
515	19.59		37.26			
516	18.76		37.63			
517	18.76		37.65			
518	18.76		37.67			
519	18.76		37.69			
520	18.76		37.71			
521	18.76		37.73			
522	18.76		37.75			
523	18.76		37.77			
524	18.76		37.8			
525	18.76		37.88			
526	16.58		38.94			
TR5	16.41		39.31			
BR5	2.83		45.22			
BR4	2.83		45.22			
BR3	2.83		45.23			
127	2.792		45.36			
128	2.0		45.72			
PO	1.08		46.16			
PI	1.08		35.0			
FLG	-5.0		37.65			
TEST	-2.0		42.69	250.0		
598	20.2	11.2	30.06	61.4	0.01	130
599	20.06		31.32			
569	19.59		36.14			
534	21.03		36.65			
535	21.03		36.67			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
536	21.03		36.69		
537	21.03		36.71		
538	21.03		36.73		
539	21.03		36.75		
540	21.03		36.76		
541	21.03		36.78		
542	21.03		36.79		
543	21.03		36.8		
544	21.03		36.81		
545	21.03		36.81		
546	21.03		36.82		
547	21.03		36.82		
548	21.03		36.82		
549	21.03		36.82		
550	21.03		36.83		
551	21.03		36.83		
552	19.59		37.5		
553	18.76		37.86		
554	18.76		37.86		
555	18.76		37.86		
556	18.76		37.86		
557	18.76		37.86		
558	18.76		37.86		
559	18.76		37.86		
560	18.76		37.86		
561	18.76		37.87		
562	18.76		37.87		
600	20.47		36.9		
601	20.33		36.96		
602	20.2		37.02		
603	20.06		37.08		
570	19.59		37.29		
565	20.19		37.0		
566	20.06		37.06		
567	19.92		37.12		
605	19.78		37.18		
604	20.06		37.1		
571	19.59		37.31		
572	19.59		37.33		
573	19.59		37.35		
574	19.59		37.37		
575	19.59		37.39		
576	19.59		37.41		
577	19.59		37.43		
578	19.59		37.5		
579	19.59		37.5		
580	19.59		37.5		
581	19.59		37.5		
582	19.59		37.5		
592	20.49		37.08		
593	20.35		37.14		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
594	20.2		37.21		
595	20.04		37.28		
583	19.59		37.5		
588	20.49		37.08		
587	20.35		37.14		
589	20.2		37.21		
590	20.04		37.29		
584	19.59		37.5		
591	20.04		37.29		
585	19.59		37.5		
586	19.59		37.5		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
596 to 597	20.33 20.47	11.20	61.04	1.5			11.000	120	30.000 -0.061			
			61.04	1.682			11.000	0.1029	1.132	Vel =	8.81	
597 to 533	20.47 21.03		0.0	1.5	T	9.9	46.500 9.900	120	31.071 -0.243			
			61.04	1.682			56.400	0.1029	5.802	Vel =	8.81	
533 to 532	21.03 21.03		-43.24	3			8.000	120	36.630 0.0			
			17.8	3.26			8.000	0.0004	0.003	Vel =	0.68	
532 to 531	21.03 21.03		-5.44	3			8.000	120	36.633 0.0			
			12.36	3.26			8.000	0.0002	0.002	Vel =	0.48	
531 to 530	21.03 21.03		-4.51	3			9.000	120	36.635 0.0			
			7.85	3.26			9.000	0	0.0	Vel =	0.30	
530 to 568	21.03 21.03		-4.00	3			9.000	120	36.635 0.0			
			3.85	3.26			9.000	0.0001	0.001	Vel =	0.15	
568 to 527	21.03 20.13		0.0	3	T	20.159	74.490 20.159	120	36.636 0.390			
			3.85	3.26			94.649	0	0.002	Vel =	0.15	
527 to 528	20.13 20.06		0.0	3			6.000	120	37.028 0.030			
			3.85	3.26			6.000	0	0.0	Vel =	0.15	
528 to 529	20.06 19.92		0.0	3			11.000	120	37.058 0.061			
			3.85	3.26			11.000	0	0.0	Vel =	0.15	
529 to 564	19.92 19.78		0.0	3			12.000	120	37.119 0.061			
			3.85	3.26			12.000	0	0.0	Vel =	0.15	
564 to 563	19.78 19.59		0.0	3	T	20.159	15.510 20.159	120	37.180 0.082			
			3.85	3.26			35.669	0	0.001	Vel =	0.15	
563 to 513	19.59 19.59		0.0	4			9.000	120	37.263 0.0			
			3.85	4.26			9.000	0	0.0	Vel =	0.09	
513 to 514	19.59 19.59		4.00	4			9.000	120	37.263 0.0			
			7.85	4.26			9.000	0.0001	0.001	Vel =	0.18	
514 to 515	19.59 19.59		4.51	4			8.000	120	37.264 0.0			
			12.36	4.26			8.000	0	0.0	Vel =	0.28	
515 to 516	19.59 18.76		5.44	4	2E	26.334	8.830 26.334	120	37.264 0.359			
			17.8	4.26			35.164	0.0001	0.004	Vel =	0.40	
516 to 517	18.76 18.76		61.70	4			10.500	120	37.627 0.0			
			79.5	4.26			10.500	0.0018	0.019	Vel =	1.79	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
517 to 518	18.76 18.76		1.25 80.75	4 4.26			10.500 10.500	120 0.0019	37.646 0.0 0.020		Vel = 1.82	
518 to 519	18.76 18.76		1.13 81.88	4 4.26			10.500 10.500	120 0.0019	37.666 0.0 0.020		Vel = 1.84	
519 to 520	18.76 18.76		1.10 82.98	4 4.26			10.500 10.500	120 0.0020	37.686 0.0 0.021		Vel = 1.87	
520 to 521	18.76 18.76		1.18 84.16	4 4.26			10.500 10.500	120 0.0020	37.707 0.0 0.021		Vel = 1.89	
521 to 522	18.76 18.76		1.34 85.5	4 4.26			10.500 10.500	120 0.0021	37.728 0.0 0.022		Vel = 1.92	
522 to 523	18.76 18.76		1.58 87.08	4 4.26			10.500 10.500	120 0.0021	37.750 0.0 0.022		Vel = 1.96	
523 to 524	18.76 18.76		1.89 88.97	4 4.26			10.500 10.500	120 0.0023	37.772 0.0 0.024		Vel = 2.00	
524 to 525	18.76 18.76		2.25 91.22	4 4.26	T	26.334	8.500 26.334 34.834	120 0.0024	37.796 0.0 0.082		Vel = 2.05	
525 to 526	18.76 16.58		31.53 122.75	6 6.357	E	17.603	180.010 17.603 197.613	120 0.0006	37.878 0.944 0.114		Vel = 1.24	
526 to TR5	16.58 16.41		0.0 122.75	6 6.357	6E	105.616	412.050 105.616 517.666	120 0.0006	38.936 0.074 0.298		Vel = 1.24	
TR5 to BR5	16.41 2.830		0.0 122.75	6 6.357	T G	37.72 3.772	13.570 41.492 55.062	120 0.0006	39.308 5.882 0.032		Vel = 1.24	
BR5 to BR4	2.830 2.83		0.0 122.75	6 6.357			1.833 1.833	120 0.0005	45.222 0.0 0.001		Vel = 1.24	
BR4 to BR3	2.83 2.83		0.0 122.75	4 4.26			1.250 1.250	120 0.0040	45.223 0.0 0.005		Vel = 2.76	
BR3 to 127	2.83 2.792		0.0 122.75	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0041	45.228 0.016 0.120		Vel = 2.76	
127 to 128	2.792 2		0.0 122.75	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0006	45.364 0.343 0.011		Vel = 1.24	
128 to PO	2 1.080		0.0 122.75	8 8.249	7E T B	147.988 41.108 14.094	31.833 256.043 287.876	120 0.0002	45.718 0.398 0.048		Vel = 0.74	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
S 52.853												
PO			0.0 122.75						46.164		K Factor = 18.07	
System Demand Pressure									46.164			
Safety Margin									77.727			
Continuation Pressure									123.891			
Pressure @ Pump Outlet									123.891			
Pressure From Pump Curve									-88.895			
Pressure @ Pump Inlet									34.996			
PI	1.080		0.0	8	5E	105.706	28.750	120	34.996			
to					G	4.698	110.404		2.633			
FLG	-5		122.75	8.249			139.154	0.0002	0.023	Vel =	0.74	
FLG	-5		0.0	8	Zfh	0.0	169.140	140	37.652			
to					2E	56.936	56.936		5.008	* * Fixed Loss = 6.307		
TEST	-2		122.75	8.27			226.076	0.0001	0.027	Vel =	0.73	
										Qa = 250.00		
TEST			250.00 372.75						42.687	K Factor = 57.05		
596	20.33		0.31	1.5			11.000	120	30.000			
to									0.056			
598	20.2		0.31	1.682			11.000	0	0.0	Vel =	0.04	
598	20.2	11.20	61.40	1.5			11.500	120	30.056			
to									0.061			
599	20.06		61.71	1.682			11.500	0.1050	1.207	Vel =	8.91	
599	20.06		0.0	1.5	E	4.95	39.010	120	31.324			
to							4.950		0.204			
569	19.59		61.71	1.682			43.960	0.1050	4.614	Vel =	8.91	
569	19.59		0.0	1.5	T	9.9	0.830	120	36.142			
to							9.900		0.359			
516	18.76		61.71	1.682			10.730	0.1049	1.126	Vel =	8.91	
										0.0		
516			61.71						37.627	K Factor = 10.06		
533	21.03		43.24	3			10.500	120	36.630			
to									0.0			
534	21.03		43.24	3.26			10.500	0.0021	0.022	Vel =	1.66	
534	21.03		-1.24	3			10.500	120	36.652			
to									0.0			
535	21.03		42.0	3.26			10.500	0.0021	0.022	Vel =	1.61	
535	21.03		-1.13	3			10.500	120	36.674			
to									0.0			
536	21.03		40.87	3.26			10.500	0.0019	0.020	Vel =	1.57	
536	21.03		-1.10	3			10.500	120	36.694			
to									0.0			
537	21.03		39.77	3.26			10.500	0.0019	0.020	Vel =	1.53	
537	21.03		-1.18	3			10.500	120	36.714			
to									0.0			
538	21.03		38.59	3.26			10.500	0.0017	0.018	Vel =	1.48	
538	21.03		-1.34	3			10.500	120	36.732			
to									0.0			
539	21.03		37.25	3.26			10.500	0.0017	0.018	Vel =	1.43	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
539 to 540	21.03 21.03		-1.59 35.66	3 3.26			10.500 10.500	120 0.0014	36.750 0.0 0.015		Vel = 1.37	
540 to 541	21.03 21.03		-1.88 33.78	3 3.26			10.500 10.500	120 0.0014	36.765 0.0 0.015		Vel = 1.30	
541 to 542	21.03 21.03		-2.25 31.53	3 3.26			10.500 10.500	120 0.0011	36.780 0.0 0.012		Vel = 1.21	
542 to 543	21.03 21.03		-3.92 27.61	3 3.26			10.500 10.500	120 0.0010	36.792 0.0 0.010		Vel = 1.06	
543 to 544	21.03 21.03		-3.63 23.98	3 3.26			10.500 10.500	120 0.0008	36.802 0.0 0.008		Vel = 0.92	
544 to 545	21.03 21.03		-3.38 20.6	3 3.26			7.500 7.500	120 0.0005	36.810 0.0 0.004		Vel = 0.79	
545 to 546	21.03 21.03		-3.08 17.52	3 3.26			13.500 13.500	120 0.0004	36.814 0.0 0.006		Vel = 0.67	
546 to 547	21.03 21.03		-3.04 14.48	3 3.26			6.170 6.170	120 0.0002	36.820 0.0 0.001		Vel = 0.56	
547 to 548	21.03 21.03		-2.98 11.5	3 3.26			9.000 9.000	120 0.0002	36.821 0.0 0.002		Vel = 0.44	
548 to 549	21.03 21.03		-2.92 8.58	3 3.26			10.000 10.000	120 0.0001	36.823 0.0 0.001		Vel = 0.33	
549 to 550	21.03 21.03		-2.87 5.71	3 3.26			10.000 10.000	120 0.0001	36.824 0.0 0.001		Vel = 0.22	
550 to 551	21.03 21.03		-2.86 2.85	3 3.26			9.000 9.000	120 0	36.825 0.0 0.0		Vel = 0.11	
551 to 552	21.03 19.59		0.0 2.85	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0004	36.825 0.624 0.047		Vel = 0.41	
552 to 553	19.59 18.76		0.0 2.85	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0004	37.496 0.359 0.004		Vel = 0.41	
553 to 554	18.76 18.76		0.0 2.85	4 4.26			9.000 9.000	120 0	37.859 0.0 0.0		Vel = 0.06	
554 to 555	18.76 18.76		2.86 5.71	4 4.26			10.000 10.000	120 0.0001	37.859 0.0 0.001		Vel = 0.13	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
555 to 556	18.76 18.76		2.87 8.58	4 4.26			10.000 10.000	120 0	37.860 0.0			
										Vel =	0.19	
556 to 557	18.76 18.76		2.92 11.5	4 4.26			9.000 9.000	120 0	37.860 0.0			
										Vel =	0.26	
557 to 558	18.76 18.76		2.98 14.48	4 4.26			6.170 6.170	120 0.0002	37.860 0.0			
										Vel =	0.33	
558 to 559	18.76 18.76		3.04 17.52	4 4.26			10.500 10.500	120 0.0001	37.861 0.0			
										Vel =	0.39	
559 to 560	18.76 18.76		3.08 20.6	4 4.26			10.500 10.500	120 0.0002	37.862 0.0			
										Vel =	0.46	
560 to 561	18.76 18.76		3.38 23.98	4 4.26			10.500 10.500	120 0.0002	37.864 0.0			
										Vel =	0.54	
561 to 562	18.76 18.76		3.63 27.61	4 4.26			10.500 10.500	120 0.0002	37.866 0.0			
										Vel =	0.62	
562 to 525	18.76 18.76		3.92 31.53	4 4.26	T	26.334	2.000 26.334 28.334	120 0.0004	37.868 0.0 0.010			
										Vel =	0.71	
525			0.0 31.53						37.878		K Factor =	5.12
534 to 600	21.03 20.47		1.25 1.25	1.5 1.682	T	9.9	46.500 9.900 56.400	120 0.0001	36.652 0.243 0.004			
										Vel =	0.18	
600 to 601	20.47 20.33		0.0 1.25	1.5 1.682			11.000 11.000	120 0.0001	36.899 0.061 0.001			
										Vel =	0.18	
601 to 602	20.33 20.2		0.0 1.25	1.5 1.682			11.000 11.000	120 0.0001	36.961 0.056 0.001			
										Vel =	0.18	
602 to 603	20.2 20.06		0.0 1.25	1.5 1.682			11.500 11.500	120 0	37.018 0.061 0.0			
										Vel =	0.18	
603 to 570	20.06 19.59		0.0 1.25	1.5 1.682	E	4.95	39.010 4.950 43.960	120 0.0001	37.079 0.204 0.003			
										Vel =	0.18	
570 to 517	19.59 18.76		0.0 1.25	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0001	37.286 0.359 0.001			
										Vel =	0.18	
517			0.0 1.25						37.646		K Factor =	0.20
532 to 515	21.03 19.59		5.44 5.44	3 3.26	2T	40.319	119.000 40.319 159.319	120 0	36.633 0.624 0.007			
										Vel =	0.21	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
515			0.0 5.44					37.264		K Factor = 0.89	
531 to 514	21.03 19.59		4.51 4.51	3 3.26	2T 40.319	119.000 40.319 159.319	120 0	36.635 0.624 0.005		Vel = 0.17	
514			0.0 4.51					37.264		K Factor = 0.74	
530 to 565	21.03 20.19		4.00 4.0	3 3.26	T 20.159	69.490 20.159 89.649	120 0	36.635 0.364 0.003		Vel = 0.15	
565 to 566	20.19 20.06		0.0 4.0	3 3.26		11.000 11.000	120 0	37.002 0.056 0.0		Vel = 0.15	
566 to 567	20.06 19.92		0.0 4.0	3 3.26		11.000 11.000	120 0	37.058 0.061 0.0		Vel = 0.15	
567 to 605	19.92 19.78		0.0 4.0	3 3.26		12.000 12.000	120 0	37.119 0.061 0.0		Vel = 0.15	
605 to 513	19.78 19.59		0.0 4.0	3 3.26	T 20.159	15.590 20.159 35.749	120 0	37.180 0.082 0.001		Vel = 0.15	
513			0.0 4.00					37.263		K Factor = 0.66	
535 to 604	21.03 20.06		1.13 1.13	1.5 1.682	T 9.9	80.000 9.900 89.900	120 0.0001	36.674 0.420 0.006		Vel = 0.16	
604 to 571	20.06 19.59		0.0 1.13	1.5 1.682	E 4.95	39.010 4.950 43.960	120 0	37.100 0.204 0.002		Vel = 0.16	
571 to 518	19.59 18.76		0.0 1.13	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0001	37.306 0.359 0.001		Vel = 0.16	
518			0.0 1.13					37.666		K Factor = 0.18	
536 to 572	21.03 19.59		1.10 1.1	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0001	36.694 0.624 0.008		Vel = 0.16	
572 to 519	19.59 18.76		0.0 1.1	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0001	37.326 0.359 0.001		Vel = 0.16	
519			0.0 1.10					37.686		K Factor = 0.18	
537 to 573	21.03 19.59		1.18 1.18	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0001	36.714 0.624 0.009		Vel = 0.17	
573 to 520	19.59 18.76		0.0 1.18	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0001	37.347 0.359 0.001		Vel = 0.17	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
520			0.0 1.18						37.707		K Factor = 0.19	
538 to 574	21.03 19.59		1.34 1.34	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0001	36.732 0.624 0.012		Vel = 0.19	
574 to 521	19.59 18.76		0.0 1.34	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0001	37.368 0.359 0.001		Vel = 0.19	
521			0.0 1.34						37.728		K Factor = 0.22	
539 to 575	21.03 19.59		1.58 1.58	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0001	36.750 0.624 0.015		Vel = 0.23	
575 to 522	19.59 18.76		0.0 1.58	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0002	37.389 0.359 0.002		Vel = 0.23	
522			0.0 1.58						37.750		K Factor = 0.26	
540 to 576	21.03 19.59		1.89 1.89	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0002	36.765 0.624 0.022		Vel = 0.27	
576 to 523	19.59 18.76		0.0 1.89	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0002	37.411 0.359 0.002		Vel = 0.27	
523			0.0 1.89						37.772		K Factor = 0.31	
541 to 577	21.03 19.59		2.25 2.25	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0002	36.780 0.624 0.030		Vel = 0.32	
577 to 524	19.59 18.76		0.0 2.25	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0003	37.434 0.359 0.003		Vel = 0.32	
524			0.0 2.25						37.796		K Factor = 0.37	
542 to 578	21.03 19.59		3.92 3.92	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0006	36.792 0.624 0.086		Vel = 0.57	
578 to 562	19.59 18.76		0.0 3.92	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0007	37.502 0.359 0.007		Vel = 0.57	
562			0.0 3.92						37.868		K Factor = 0.64	
543 to 579	21.03 19.59		3.62 3.62	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0006	36.802 0.624 0.074		Vel = 0.52	
579 to 561	19.59 18.76		0.0 3.62	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0007	37.500 0.359 0.007		Vel = 0.52	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
561			0.0 3.62						37.866		K Factor = 0.59	
544 to 580	21.03 19.59		3.38 3.38	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0005	36.810 0.624 0.065		Vel = 0.49	
580 to 560	19.59 18.76		0.0 3.38	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0006	37.499 0.359 0.006		Vel = 0.49	
560			0.0 3.38						37.864		K Factor = 0.55	
545 to 581	21.03 19.59		3.08 3.08	1.5 1.682	T 3E	9.9 14.849	122.010 24.749 146.759	120 0.0004	36.814 0.624 0.060		Vel = 0.44	
581 to 559	19.59 18.76		0.0 3.08	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	37.498 0.359 0.005		Vel = 0.44	
559			0.0 3.08						37.862		K Factor = 0.50	
546 to 582	21.03 19.59		3.04 3.04	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0004	36.820 0.624 0.053		Vel = 0.44	
582 to 558	19.59 18.76		0.0 3.04	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	37.497 0.359 0.005		Vel = 0.44	
558			0.0 3.04						37.861		K Factor = 0.49	
547 to 592	21.03 20.49		2.98 2.98	1.5 1.682	T	9.9	45.000 9.900 54.900	120 0.0004	36.821 0.234 0.021		Vel = 0.43	
592 to 593	20.49 20.35		0.0 2.98	1.5 1.682			11.000 11.000	120 0.0004	37.076 0.061 0.004		Vel = 0.43	
593 to 594	20.35 20.2		0.0 2.98	1.5 1.682			13.000 13.000	120 0.0004	37.141 0.065 0.005		Vel = 0.43	
594 to 595	20.2 20.04		0.0 2.98	1.5 1.682			12.500 12.500	120 0.0004	37.211 0.069 0.005		Vel = 0.43	
595 to 583	20.04 19.59		0.0 2.98	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0004	37.285 0.195 0.017		Vel = 0.43	
583 to 557	19.59 18.76		0.0 2.98	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0004	37.497 0.359 0.004		Vel = 0.43	
557			0.0 2.98						37.860		K Factor = 0.48	
548 to 588	21.03 20.49		2.92 2.92	1.5 1.682	T	9.9	45.000 9.900 54.900	120 0.0004	36.823 0.234 0.020		Vel = 0.42	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
588 to 587	20.49 20.35		0.0 2.92	1.5 1.682			11.000 11.000	120 0.0004	37.077 0.061 0.004		Vel = 0.42	
587 to 589	20.35 20.2		0.0 2.92	1.5 1.682			13.000 13.000	120 0.0004	37.142 0.065 0.005		Vel = 0.42	
589 to 590	20.2 20.04		0.0 2.92	1.5 1.682			12.500 12.500	120 0.0004	37.212 0.069 0.005		Vel = 0.42	
590 to 584	20.04 19.59		0.0 2.92	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0004	37.286 0.195 0.015		Vel = 0.42	
584 to 556	19.59 18.76		0.0 2.92	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	37.496 0.359 0.005		Vel = 0.42	
556			0.0 2.92						37.860		K Factor = 0.47	
549 to 591	21.03 20.04		2.88 2.88	1.5 1.682	T	9.9	81.500 9.900 91.400	120 0.0004	36.824 0.429 0.033		Vel = 0.42	
591 to 585	20.04 19.59		0.0 2.88	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0004	37.286 0.195 0.015		Vel = 0.42	
585 to 555	19.59 18.76		0.0 2.88	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	37.496 0.359 0.005		Vel = 0.42	
555			0.0 2.88						37.860		K Factor = 0.47	
550 to 586	21.03 19.59		2.86 2.86	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0004	36.825 0.624 0.047		Vel = 0.41	
586 to 554	19.59 18.76		0.0 2.86	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0004	37.496 0.359 0.004		Vel = 0.41	
554			0.0 2.86						37.859		K Factor = 0.46	



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS5 GR SALES 9.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

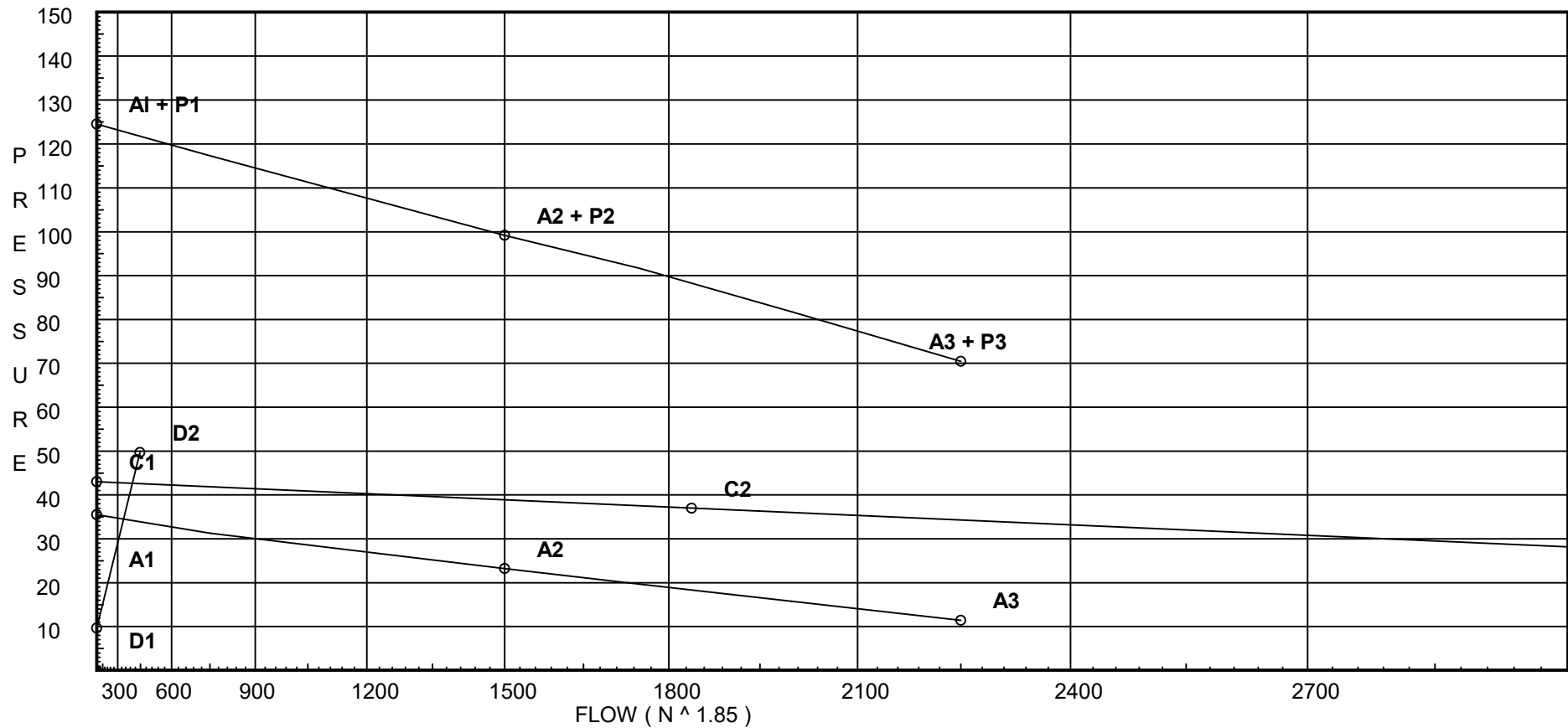
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.671
D2 - System Flow : 446.013
D2 - System Pressure : 49.706
Hose (Demand) :
D3 - System Demand : 446.013
Hose (Adj City) : 250
Safety Margin : 71.276



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			120.982	446.01	49.706
TEST	43.0	37	1839.0	42.006	696.01	42.006

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>	
596	20.33	11.2	18.0	47.52	0.01	130
597	20.47	11.2	18.63	48.34	0.01	130
533	21.03		31.57			
532	21.03		31.6			
531	21.03		31.62			
530	21.03		31.63			
568	21.03		31.63			
527	20.13		32.04			
528	20.06		32.08			
529	19.92		32.14			
564	19.78		32.2			
563	19.59		32.3			
513	19.59		32.3			
514	19.59		32.3			
515	19.59		32.3			
516	18.76		32.7			
517	18.76		32.77			
518	18.76		32.94			
519	18.76		33.15			
520	18.76		33.37			
521	18.76		33.59			
522	18.76		33.83			
523	18.76		34.07			
524	18.76		34.32			
525	18.76		35.21			
526	16.58		37.39			
TR5	16.41		40.72			
BR5	2.83		46.95			
BR4	2.83		46.96			
BR3	2.83		47.01			
127	2.792		48.33			
128	2.0		48.8			
PO	1.08		49.71			
PI	1.08		33.13			
FLG	-5.0		36.01			
TEST	-2.0		42.01	250.0		
598	20.2	11.2	18.06	47.59	0.01	130
599	20.06	11.2	18.89	48.67	0.01	130
569	19.59		29.74			
534	21.03		31.58			
535	21.03		31.75			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes	
536	21.03		31.99			
537	21.03		32.22			
538	21.03		32.43			
539	21.03		32.62			
540	21.03		32.8			
541	21.03		32.96			
542	21.03		33.1			
543	21.03		33.21			
544	21.03		33.29			
545	21.03		33.34			
546	21.03		33.4			
547	21.03		33.42			
548	21.03		33.44			
549	21.03		33.45			
550	21.03		33.45			
551	21.03		33.45			
552	19.59		34.6			
553	18.76		35.01			
554	18.76		35.01			
555	18.76		35.01			
556	18.76		35.01			
557	18.76		35.02			
558	18.76		35.02			
559	18.76		35.03			
560	18.76		35.05			
561	18.76		35.07			
562	18.76		35.1			
600	20.47	11.2	18.65	48.37	0.01	130
601	20.33	11.2	18.02	47.55	0.01	130
602	20.2	11.2	18.08	47.62	0.01	130
603	20.06	11.2	18.91	48.71	0.01	130
570	19.59		29.8			
565	20.19		32.02			
566	20.06		32.08			
567	19.92		32.14			
605	19.78		32.2			
604	20.06	11.2	30.28	61.63	0.01	130
571	19.59		32.17			
572	19.59		32.78			
573	19.59		32.99			
574	19.59		33.22			
575	19.59		33.45			
576	19.59		33.69			
577	19.59		33.94			
578	19.59		34.67			
579	19.59		34.65			
580	19.59		34.63			
581	19.59		34.63			
582	19.59		34.61			
592	20.49		33.88			
593	20.35		33.99			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
594	20.2		34.11		
595	20.04		34.24		
583	19.59		34.61		
588	20.49		33.89		
587	20.35		34.0		
589	20.2		34.12		
590	20.04		34.24		
584	19.59		34.61		
591	20.04		34.24		
585	19.59		34.6		
586	19.59		34.6		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
596 to 597	20.33 20.47	11.20	46.78 46.78	1.5 1.682			11.000 11.000	120 0.0629	18.000 -0.061 0.692		Vel = 6.75	
597 to 533	20.47 21.03	11.20	48.34 95.12	1.5 1.682	T	9.9	46.500 9.900 56.400	120 0.2337	18.631 -0.243 13.182		Vel = 13.73	
533 to 532	21.03 21.03		-33.20 61.92	3 3.26			8.000 8.000	120 0.0042	31.570 0.0 0.034		Vel = 2.38	
532 to 531	21.03 21.03		-18.92 43.0	3 3.26			8.000 8.000	120 0.0021	31.604 0.0 0.017		Vel = 1.65	
531 to 530	21.03 21.03		-15.69 27.31	3 3.26			9.000 9.000	120 0.0010	31.621 0.0 0.009		Vel = 1.05	
530 to 568	21.03 21.03		-13.91 13.4	3 3.26			9.000 9.000	120 0.0002	31.630 0.0 0.002		Vel = 0.52	
568 to 527	21.03 20.13		0.0 13.4	3 3.26	T	20.159	74.490 20.159 94.649	120 0.0002	31.632 0.390 0.023		Vel = 0.52	
527 to 528	20.13 20.06		0.0 13.4	3 3.26			6.000 6.000	120 0.0003	32.045 0.030 0.002		Vel = 0.52	
528 to 529	20.06 19.92		0.0 13.4	3 3.26			11.000 11.000	120 0.0002	32.077 0.061 0.002		Vel = 0.52	
529 to 564	19.92 19.78		0.0 13.4	3 3.26			12.000 12.000	120 0.0002	32.140 0.061 0.003		Vel = 0.52	
564 to 563	19.78 19.59		0.0 13.4	3 3.26	T	20.159	15.510 20.159 35.669	120 0.0003	32.204 0.082 0.009		Vel = 0.52	
563 to 513	19.59 19.59		0.0 13.4	4 4.26			9.000 9.000	120 0.0001	32.295 0.0 0.001		Vel = 0.30	
513 to 514	19.59 19.59		13.91 27.31	4 4.26			9.000 9.000	120 0.0002	32.296 0.0 0.002		Vel = 0.61	
514 to 515	19.59 19.59		15.69 43.0	4 4.26			8.000 8.000	120 0.0006	32.298 0.0 0.005		Vel = 0.97	
515 to 516	19.59 18.76		18.92 61.92	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0011	32.303 0.359 0.040		Vel = 1.39	
516 to 517	18.76 18.76		97.00 158.92	4 4.26			10.500 10.500	120 0.0066	32.702 0.0 0.069		Vel = 3.58	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
517 to 518	18.76 18.76		97.17 256.09	4 4.26		10.500 10.500	120 0.0158	32.771 0.0 0.166		Vel = 5.76	
518 to 519	18.76 18.76		35.74 291.83	4 4.26		10.500 10.500	120 0.0201	32.937 0.0 0.211		Vel = 6.57	
519 to 520	18.76 18.76		5.48 297.31	4 4.26		10.500 10.500	120 0.0209	33.148 0.0 0.219		Vel = 6.69	
520 to 521	18.76 18.76		5.39 302.7	4 4.26		10.500 10.500	120 0.0215	33.367 0.0 0.226		Vel = 6.81	
521 to 522	18.76 18.76		5.69 308.39	4 4.26		10.500 10.500	120 0.0223	33.593 0.0 0.234		Vel = 6.94	
522 to 523	18.76 18.76		6.34 314.73	4 4.26		10.500 10.500	120 0.0231	33.827 0.0 0.243		Vel = 7.08	
523 to 524	18.76 18.76		7.27 322.0	4 4.26		10.500 10.500	120 0.0242	34.070 0.0 0.254		Vel = 7.25	
524 to 525	18.76 18.76		8.46 330.46	4 4.26	T 26.334	8.500 26.334 34.834	120 0.0253	34.324 0.0 0.883		Vel = 7.44	
525 to 526	18.76 16.58		115.55 446.01	6 6.357	E 17.603	180.010 17.603 197.613	120 0.0063	35.207 0.944 1.241		Vel = 4.51	
526 to TR5	16.58 16.41		0.0 446.01	6 6.357	6E 105.616	412.050 105.616 517.666	120 0.0063	37.392 0.074 3.252		Vel = 4.51	
TR5 to BR5	16.41 2.830		0.0 446.01	6 6.357	T 37.72 G 3.772	13.570 41.492 55.062	120 0.0063	40.718 5.882 0.346		Vel = 4.51	
BR5 to BR4	2.830 2.83		0.0 446.01	6 6.357		1.833 1.833	120 0.0060	46.946 0.0 0.011		Vel = 4.51	
BR4 to BR3	2.83 2.83		0.0 446.01	4 4.26		1.250 1.250	120 0.0440	46.957 0.0 0.055		Vel = 10.04	
BR3 to 127	2.83 2.792		0.0 446.01	4 4.26	T 26.334	3.170 26.334 29.504	120 0.0442	47.012 0.016 1.303		Vel = 10.04	
127 to 128	2.792 2		0.0 446.01	6 6.357	E 17.603	2.375 17.603 19.978	120 0.0063	48.331 0.343 0.125		Vel = 4.51	
128 to PO	2 1.080		0.0 446.01	8 8.249	7E 147.988 T 41.108 B 14.094	31.833 256.043 287.876	120 0.0018	48.799 0.398 0.509		Vel = 2.68	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
S						52.853						
PO			0.0 446.01						49.706		K Factor = 63.26	
System Demand Pressure									49.706			
Safety Margin									71.276			
Continuation Pressure									120.982			
Pressure @ Pump Outlet									120.982			
Pressure From Pump Curve									-87.853			
Pressure @ Pump Inlet									33.129			
PI to FLG	1.080 -5		0.0 446.01	8 8.249	5E G	105.706 4.698	28.750 110.404	120	33.129 2.633			
									0.0018	0.246	Vel =	2.68
FLG to TEST	-5 -2		0.0 446.01	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936	140	36.008 5.701		* * Fixed Loss = 7	
									0.0013	0.296	Vel =	2.66
											Qa = 250.00	
TEST			250.00 696.01						42.005		K Factor = 107.39	
596 to 598	20.33 20.2		0.74	1.5			11.000	120	18.000 0.056			
									0.0001	0.001	Vel =	0.11
598 to 599	20.2 20.06	11.20	47.59	1.5			11.500	120	18.057 0.061			
									0.0667	0.767	Vel =	6.98
599 to 569	20.06 19.59	11.20	48.67	1.5	E	4.95	39.010 4.950	120	18.885 0.204			
									0.2423	10.653	Vel =	14.01
569 to 516	19.59 18.76		0.0	1.5	T	9.9	0.830 9.900	120	29.742 0.359			
									0.2424	2.601	Vel =	14.01
516			0.0 97.00						32.702		K Factor = 16.96	
533 to 534	21.03 21.03		33.20	3			10.500	120	31.570 0.0			
									0.0013	0.014	Vel =	1.28
534 to 535	21.03 21.03		95.09	3			10.500	120	31.584 0.0			
									0.0162	0.170	Vel =	4.93
535 to 536	21.03 21.03		128.29	3			10.500	120	31.754 0.0			
									0.0228	0.239	Vel =	5.93
536 to 537	21.03 21.03		-5.48	3			10.500	120	31.993 0.0			
									0.0213	0.224	Vel =	5.72
537 to 538	21.03 21.03		-5.39	3			10.500	120	32.217 0.0			
									0.0199	0.209	Vel =	5.51
538 to 539	21.03 21.03		-5.69	3			10.500	120	32.426 0.0			
									0.0184	0.193	Vel =	5.29

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
539 to 540	21.03 21.03		-6.33 131.29	3 3.26		10.500 10.500	120 0.0170	32.619 0.0 0.178		Vel = 5.05	
540 to 541	21.03 21.03		-7.28 124.01	3 3.26		10.500 10.500	120 0.0151	32.797 0.0 0.159		Vel = 4.77	
541 to 542	21.03 21.03		-8.46 115.55	3 3.26		10.500 10.500	120 0.0134	32.956 0.0 0.141		Vel = 4.44	
542 to 543	21.03 21.03		-14.37 101.18	3 3.26		10.500 10.500	120 0.0104	33.097 0.0 0.109		Vel = 3.89	
543 to 544	21.03 21.03		-13.28 87.9	3 3.26		10.500 10.500	120 0.0081	33.206 0.0 0.085		Vel = 3.38	
544 to 545	21.03 21.03		-12.38 75.52	3 3.26		7.500 7.500	120 0.0060	33.291 0.0 0.045		Vel = 2.90	
545 to 546	21.03 21.03		-11.30 64.22	3 3.26		13.500 13.500	120 0.0045	33.336 0.0 0.061		Vel = 2.47	
546 to 547	21.03 21.03		-11.15 53.07	3 3.26		6.170 6.170	120 0.0032	33.397 0.0 0.020		Vel = 2.04	
547 to 548	21.03 21.03		-10.92 42.15	3 3.26		9.000 9.000	120 0.0020	33.417 0.0 0.018		Vel = 1.62	
548 to 549	21.03 21.03		-10.69 31.46	3 3.26		10.000 10.000	120 0.0012	33.435 0.0 0.012		Vel = 1.21	
549 to 550	21.03 21.03		-10.54 20.92	3 3.26		10.000 10.000	120 0.0006	33.447 0.0 0.006		Vel = 0.80	
550 to 551	21.03 21.03		-10.47 10.45	3 3.26		9.000 9.000	120 0.0001	33.453 0.0 0.001		Vel = 0.40	
551 to 552	21.03 19.59		0.0 10.45	1.5 1.682	T E	9.9 4.95 119.000 14.850 133.850	120 0.0039	33.454 0.624 0.526		Vel = 1.51	
552 to 553	19.59 18.76		0.0 10.45	1.5 1.682	T	9.9 0.830 9.900 10.730	120 0.0040	34.604 0.359 0.043		Vel = 1.51	
553 to 554	18.76 18.76		0.0 10.45	4 4.26		9.000 9.000	120 0	35.006 0.0 0.0		Vel = 0.24	
554 to 555	18.76 18.76		10.47 20.92	4 4.26		10.000 10.000	120 0.0002	35.006 0.0 0.002		Vel = 0.47	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
555 to 556	18.76 18.76		10.54 31.46	4 4.26			10.000 10.000	120 0.0003	35.008 0.0 0.003		Vel = 0.71	
556 to 557	18.76 18.76		10.69 42.15	4 4.26			9.000 9.000	120 0.0006	35.011 0.0 0.005		Vel = 0.95	
557 to 558	18.76 18.76		10.92 53.07	4 4.26			6.170 6.170	120 0.0008	35.016 0.0 0.005		Vel = 1.19	
558 to 559	18.76 18.76		11.15 64.22	4 4.26			10.500 10.500	120 0.0012	35.021 0.0 0.013		Vel = 1.45	
559 to 560	18.76 18.76		11.30 75.52	4 4.26			10.500 10.500	120 0.0016	35.034 0.0 0.017		Vel = 1.70	
560 to 561	18.76 18.76		12.38 87.9	4 4.26			10.500 10.500	120 0.0022	35.051 0.0 0.023		Vel = 1.98	
561 to 562	18.76 18.76		13.28 101.18	4 4.26			10.500 10.500	120 0.0029	35.074 0.0 0.030		Vel = 2.28	
562 to 525	18.76 18.76		14.37 115.55	4 4.26	T	26.334	2.000 26.334 28.334	120 0.0036	35.104 0.0 0.103		Vel = 2.60	
525			0.0 115.55						35.207		K Factor = 19.47	
534 to 600	21.03 20.47		-95.09 -95.09	1.5 1.682	T	9.9	46.500 9.900 56.400	120 -0.2336	31.584 0.243 -13.174		Vel = 13.73	
600 to 601	20.47 20.33	11.20	48.37 -46.72	1.5 1.682			11.000 11.000	120 -0.0627	18.653 0.061 -0.690		Vel = 6.75	
601 to 602	20.33 20.2	11.20	47.55 0.83	1.5 1.682			11.000 11.000	120 0.0001	18.024 0.056 0.001		Vel = 0.12	
602 to 603	20.2 20.06	11.20	47.63 48.46	1.5 1.682			11.500 11.500	120 0.0670	18.081 0.061 0.771		Vel = 7.00	
603 to 570	20.06 19.59	11.20	48.70 97.16	1.5 1.682	E	4.95	39.010 4.950 43.960	120 0.2431	18.913 0.204 10.686		Vel = 14.03	
570 to 517	19.59 18.76		0.0 97.16	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.2432	29.803 0.359 2.609		Vel = 14.03	
517			0.0 97.16						32.771		K Factor = 16.97	
532 to 515	21.03 19.59		18.92 18.92	3 3.26	2T	40.319	119.000 40.319 159.319	120 0.0005	31.604 0.624 0.075		Vel = 0.73	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
515			0.0 18.92					32.303		K Factor = 3.33	
531 to 514	21.03 19.59		15.70 15.7	3 3.26	2T 40.319	119.000 40.319 159.319	120 0.0003	31.621 0.624 0.053		Vel = 0.60	
514			0.0 15.70					32.298		K Factor = 2.76	
530 to 565	21.03 20.19		13.91 13.91	3 3.26	T 20.159	69.490 20.159 89.649	120 0.0003	31.630 0.364 0.023		Vel = 0.53	
565 to 566	20.19 20.06		0.0 13.91	3 3.26		11.000 11.000	120 0.0003	32.017 0.056 0.003		Vel = 0.53	
566 to 567	20.06 19.92		0.0 13.91	3 3.26		11.000 11.000	120 0.0003	32.076 0.061 0.003		Vel = 0.53	
567 to 605	19.92 19.78		0.0 13.91	3 3.26		12.000 12.000	120 0.0002	32.140 0.061 0.003		Vel = 0.53	
605 to 513	19.78 19.59		0.0 13.91	3 3.26	T 20.159	15.590 20.159 35.749	120 0.0003	32.204 0.082 0.010		Vel = 0.53	
513			0.0 13.91					32.296		K Factor = 2.45	
535 to 604	21.03 20.06		-25.89 -25.89	1.5 1.682	T 9.9	80.000 9.900 89.900	120 -0.0210	31.754 0.420 -1.891		Vel = 3.74	
604 to 571	20.06 19.59	11.20	61.64 35.75	1.5 1.682	E 4.95	39.010 4.950 43.960	120 0.0382	30.283 0.204 1.680		Vel = 5.16	
571 to 518	19.59 18.76		0.0 35.75	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0383	32.167 0.359 0.411		Vel = 5.16	
518			0.0 35.75					32.937		K Factor = 6.23	
536 to 572	21.03 19.59		5.47 5.47	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0012	31.993 0.624 0.159		Vel = 0.79	
572 to 519	19.59 18.76		0.0 5.47	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0012	32.776 0.359 0.013		Vel = 0.79	
519			0.0 5.47					33.148		K Factor = 0.95	
537 to 573	21.03 19.59		5.39 5.39	1.5 1.682	T E 4.95	119.010 14.850 133.860	120 0.0012	32.217 0.624 0.154		Vel = 0.78	
573 to 520	19.59 18.76		0.0 5.39	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0012	32.995 0.359 0.013		Vel = 0.78	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
520			0.0 5.39						33.367		K Factor = 0.93	
538 to 574	21.03 19.59		5.69 5.69	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0013	32.426 0.624 0.170		Vel = 0.82	
574 to 521	19.59 18.76		0.0 5.69	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0013	33.220 0.359 0.014		Vel = 0.82	
521			0.0 5.69						33.593		K Factor = 0.98	
539 to 575	21.03 19.59		6.33 6.33	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0016	32.619 0.624 0.208		Vel = 0.91	
575 to 522	19.59 18.76		0.0 6.33	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0016	33.451 0.359 0.017		Vel = 0.91	
522			0.0 6.33						33.827		K Factor = 1.09	
540 to 576	21.03 19.59		7.27 7.27	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0020	32.797 0.624 0.269		Vel = 1.05	
576 to 523	19.59 18.76		0.0 7.27	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0020	33.690 0.359 0.021		Vel = 1.05	
523			0.0 7.27						34.070		K Factor = 1.25	
541 to 577	21.03 19.59		8.46 8.46	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0027	32.956 0.624 0.356		Vel = 1.22	
577 to 524	19.59 18.76		0.0 8.46	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0027	33.936 0.359 0.029		Vel = 1.22	
524			0.0 8.46						34.324		K Factor = 1.44	
542 to 578	21.03 19.59		14.37 14.37	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0071	33.097 0.624 0.948		Vel = 2.07	
578 to 562	19.59 18.76		0.0 14.37	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0071	34.669 0.359 0.076		Vel = 2.07	
562			0.0 14.37						35.104		K Factor = 2.43	
543 to 579	21.03 19.59		13.28 13.28	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0061	33.206 0.624 0.819		Vel = 1.92	
579 to 561	19.59 18.76		0.0 13.28	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0062	34.649 0.359 0.066		Vel = 1.92	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
561			0.0 13.28						35.074		K Factor = 2.24	
544 to 580	21.03 19.59		12.38 12.38	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0054	33.291 0.624 0.719		Vel = 1.79	
580 to 560	19.59 18.76		0.0 12.38	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0054	34.634 0.359 0.058		Vel = 1.79	
560			0.0 12.38						35.051		K Factor = 2.09	
545 to 581	21.03 19.59		11.30 11.3	1.5 1.682	T 3E	9.9 14.849	122.010 24.749 146.759	120 0.0045	33.336 0.624 0.666		Vel = 1.63	
581 to 559	19.59 18.76		0.0 11.3	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0046	34.626 0.359 0.049		Vel = 1.63	
559			0.0 11.30						35.034		K Factor = 1.91	
546 to 582	21.03 19.59		11.15 11.15	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0044	33.397 0.624 0.593		Vel = 1.61	
582 to 558	19.59 18.76		0.0 11.15	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0045	34.614 0.359 0.048		Vel = 1.61	
558			0.0 11.15						35.021		K Factor = 1.88	
547 to 592	21.03 20.49		10.92 10.92	1.5 1.682	T	9.9	45.000 9.900 54.900	120 0.0042	33.417 0.234 0.233		Vel = 1.58	
592 to 593	20.49 20.35		0.0 10.92	1.5 1.682			11.000 11.000	120 0.0043	33.884 0.061 0.047		Vel = 1.58	
593 to 594	20.35 20.2		0.0 10.92	1.5 1.682			13.000 13.000	120 0.0042	33.992 0.065 0.055		Vel = 1.58	
594 to 595	20.2 20.04		0.0 10.92	1.5 1.682			12.500 12.500	120 0.0043	34.112 0.069 0.054		Vel = 1.58	
595 to 583	20.04 19.59		0.0 10.92	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0043	34.235 0.195 0.181		Vel = 1.58	
583 to 557	19.59 18.76		0.0 10.92	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0043	34.611 0.359 0.046		Vel = 1.58	
557			0.0 10.92						35.016		K Factor = 1.85	
548 to 588	21.03 20.49		10.69 10.69	1.5 1.682	T	9.9	45.000 9.900 54.900	120 0.0041	33.435 0.234 0.225		Vel = 1.54	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
588 to 587	20.49 20.35		0.0 10.69	1.5 1.682			11.000 11.000	120 0.0041	33.894 0.061 0.045		Vel = 1.54	
587 to 589	20.35 20.2		0.0 10.69	1.5 1.682			13.000 13.000	120 0.0041	34.000 0.065 0.053		Vel = 1.54	
589 to 590	20.2 20.04		0.0 10.69	1.5 1.682			12.500 12.500	120 0.0041	34.118 0.069 0.051		Vel = 1.54	
590 to 584	20.04 19.59		0.0 10.69	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0041	34.238 0.195 0.174		Vel = 1.54	
584 to 556	19.59 18.76		0.0 10.69	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0042	34.607 0.359 0.045		Vel = 1.54	
556			0.0 10.69						35.011		K Factor = 1.81	
549 to 591	21.03 20.04		10.54 10.54	1.5 1.682	T	9.9	81.500 9.900 91.400	120 0.0040	33.447 0.429 0.365		Vel = 1.52	
591 to 585	20.04 19.59		0.0 10.54	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0040	34.241 0.195 0.169		Vel = 1.52	
585 to 555	19.59 18.76		0.0 10.54	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0041	34.605 0.359 0.044		Vel = 1.52	
555			0.0 10.54						35.008		K Factor = 1.78	
550 to 586	21.03 19.59		10.47 10.47	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0039	33.453 0.624 0.527		Vel = 1.51	
586 to 554	19.59 18.76		0.0 10.47	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0040	34.604 0.359 0.043		Vel = 1.51	
554			0.0 10.47						35.006		K Factor = 1.77	

AutoPeaking Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

Auto Peaking Summary - List of Pipes for Area Calculated

Left			Right		
Side			Side		
From	To	Length	From	To	Length
597	533	46.500	599	569	39.010
603	570	39.010	534	600	46.500
604	571	39.010	535	604	80.000

Flow		Safety	Pressure
Required		Margin	Differential
Left	11.000	696.161	71.590
Area Calculated		696.013	71.276
Right	11.000	695.620	71.643

Typical Distance Between Heads = 11.000
Split Point Used in Worst Area Peaked = 596



Engineering & Consulting

ENGINEERS | CONSULTANTS | ANALYSTS | ASSESSORS

Telgian E&C
900 Circle 75 Pkwy.
Ste 680
Atlanta, GA 30339
770.432.3882

Job Name : WM 2403 PUYALLUP WA
Building :
Location :
System :
Contract :
Data File : SYS5 GR STOCK 2.WXF

Water Supply Curve

Telgian E&C
WM 2403 PUYALLUP WA

Page 1
Date 050124

City Water Supply:

C1 - Static Pressure : 43
C2 - Residual Pressure: 37
C2 - Residual Flow : 1839

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

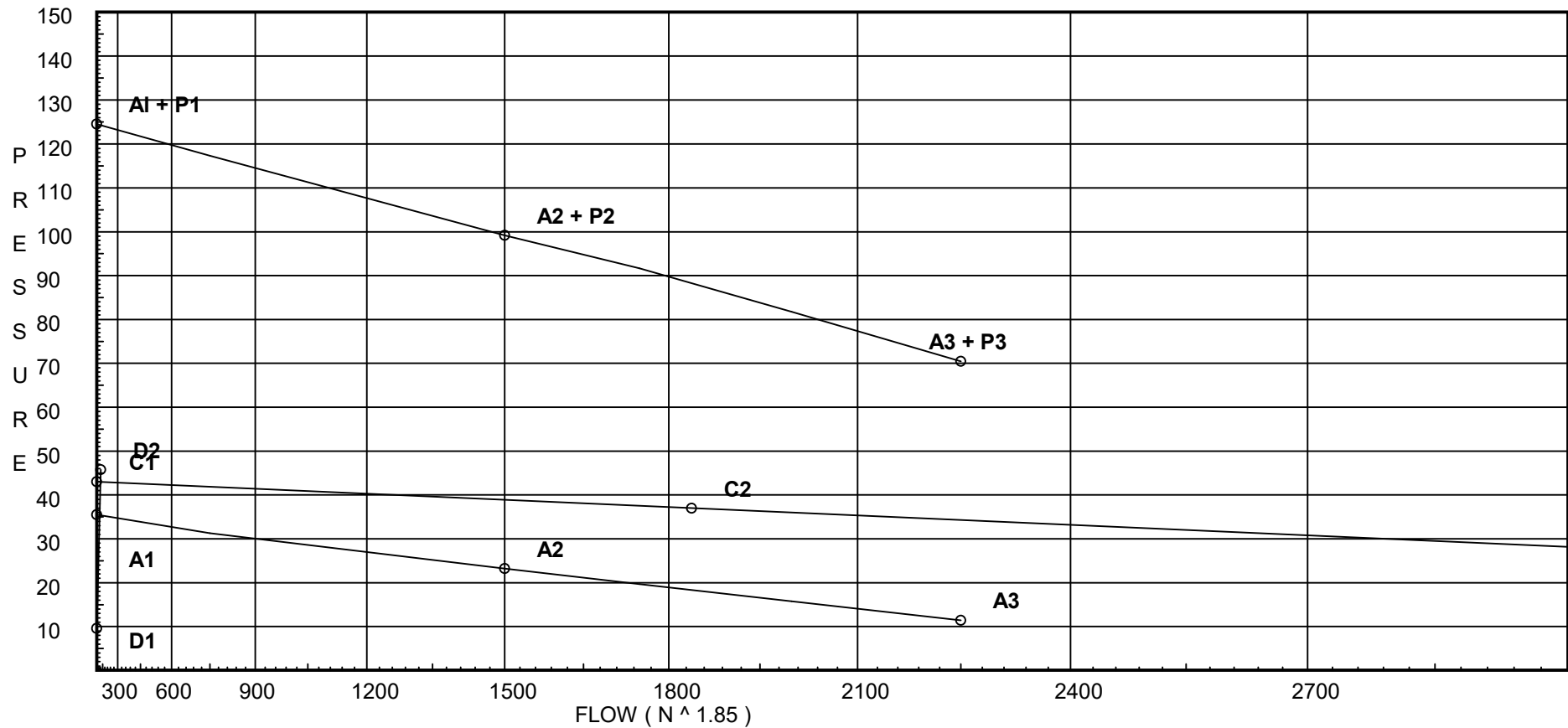
A1 - Adjusted Static: 35.516
A2 - Adj Resid : 23.203 @ 1500
A3 - Adj Resid : 11.437 @ 2250

Pump Data:

P1 - Pump Churn Pressure : 89
P2 - Pump Rated Pressure : 76
P2 - Pump Rated Flow : 1500
P3 - Pump Pressure @ Max Flow : 59
P3 - Pump Max Flow : 2250
City Residual Flow @ 0 = 5332.31
City Residual Flow @ 20 = 3802.14
City Water @ 150% of Pump = 34.29

Demand:

D1 - Elevation : 9.576
D2 - System Flow : 122.716
D2 - System Pressure : 45.800
Hose (Demand) :
D3 - System Demand : 122.716
Hose (Adj City) : 250
Safety Margin : 78.091



Fittings Used Summary

Telgian E&C
WM 2403 PUYALLUP WA

Page 2
Date 050124

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
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
Zfh	Febco 806YD	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

Telgian E&C
WM 2403 PUYALLUP WA

Page 3
Date 050124

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>
PO	See Information on Pump Curve			123.891	122.72	45.8
TEST	43.0	37	1839.0	42.687	372.72	42.687

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>	
SP01	20.54	11.2	30.0	61.34	0.01	130
EQ01	19.79		36.28			
SP05	20.86	11.2	30.0	61.34	0.01	130
EQ05	20.11		36.28			
SP03	20.79	11.2	30.0	61.34	0.01	130
EQ03	20.04		36.28			
SP02	20.65	11.2	30.0	61.34	0.01	130
EQ02	19.9		36.28			
SP04	20.92	11.2	30.0	61.34	0.01	130
EQ04	20.17		36.28			
527	20.11	10.19	36.28	61.34	K=K @ EQ05	
568	21.03		36.17			
530	21.03		36.19			
531	21.03		36.22			
532	21.03		36.23			
533	21.03		36.26			
534	21.03		36.28			
535	21.03		36.3			
536	21.03		36.33			
537	21.03		36.35			
538	21.03		36.37			
539	21.03		36.38			
540	21.03		36.4			
541	21.03		36.42			
542	21.03		36.43			
543	21.03		36.44			
544	21.03		36.45			
545	21.03		36.45			
546	21.03		36.46			
547	21.03		36.46			
548	21.03		36.46			
549	21.03		36.46			
550	21.03		36.46			
551	21.03		36.46			
552	19.59		37.13			
553	18.76		37.5			
554	18.76		37.5			
555	18.76		37.5			
556	18.76		37.5			
557	18.76		37.5			
558	18.76		37.5			

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 4
Date 050124

NODE ANALYSIS (cont.)

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
559	18.76		37.5		
560	18.76		37.5		
561	18.76		37.5		
562	18.76		37.51		
525	18.76		37.51		
526	16.58		38.57		
TR5	16.41		38.94		
BR5	2.83		44.86		
BR4	2.83		44.86		
BR3	2.83		44.86		
127	2.792		45.0		
128	2.0		45.36		
PO	1.08		45.8		
PI	1.08		35.0		
FLG	-5.0		37.65		
TEST	-2.0		42.69	250.0	
528	20.04	10.19	36.31	61.37	K=K @ EQ03
529	19.9		36.43		
564	19.79		36.52		
563	19.59		36.81		
513	19.59		36.82		
514	19.59		36.84		
515	19.59		36.85		
516	18.76		37.27		
517	18.76		37.29		
518	18.76		37.31		
519	18.76		37.33		
520	18.76		37.35		
521	18.76		37.37		
522	18.76		37.39		
523	18.76		37.41		
524	18.76		37.43		
565	20.17		36.57		
566	20.04		36.63		
567	19.9		36.69		
605	19.79		36.74		
606	19.79		36.75		
597	20.47		36.51		
596	20.33		36.57		
598	20.2		36.63		
599	20.06		36.7		
569	19.59		36.91		
600	20.47		36.53		
601	20.33		36.6		
602	20.2		36.65		
603	20.06		36.72		
570	19.59		36.93		
604	20.06		36.74		
571	19.59		36.94		
572	19.59		36.97		
573	19.59		36.98		

Flow Summary - NFPA

Telgian E&C
WM 2403 PUYALLUP WA

Page 5
Date 050124

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>
574	19.59		37.01		
575	19.59		37.03		
576	19.59		37.05		
577	19.59		37.07		
578	19.59		37.14		
579	19.59		37.14		
580	19.59		37.14		
581	19.59		37.13		
582	19.59		37.13		
592	20.49		36.71		
593	20.35		36.78		
594	20.2		36.85		
595	20.04		36.92		
583	19.59		37.13		
588	20.49		36.71		
587	20.35		36.78		
589	20.2		36.85		
590	20.04		36.92		
584	19.59		37.13		
591	20.04		36.92		
585	19.59		37.13		
586	19.59		37.13		

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 6
Date 050124

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	*****
SP01 to EQ01	20.54 19.79	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950			Vel = 22.77
EQ01			0.0 61.34					36.275		K Factor = 10.18	
SP05 to EQ05	20.86 20.11	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950			Vel = 22.77
EQ05			0.0 61.34					36.275		K Factor = 10.18	
SP03 to EQ03	20.79 20.04	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950			Vel = 22.77
EQ03			0.0 61.34					36.275		K Factor = 10.18	
SP02 to EQ02	20.65 19.9	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950			Vel = 22.77
EQ02			0.0 61.34					36.275		K Factor = 10.18	
SP04 to EQ04	20.92 20.17	11.20	61.34 61.34	1 1.049	T 5.0	0.750 5.000 5.750	120 1.0348	30.000 0.325 5.950			Vel = 22.77
EQ04			0.0 61.34					36.275		K Factor = 10.18	
527 to 568	20.11 21.03	10.19	51.61 51.61	3 3.26	T 20.159	76.160 20.159 96.319	120 0.0030	36.275 -0.398 0.289		K = K @ EQ05	Vel = 1.98
568 to 530	21.03 21.03		0.0 51.61	3 3.26		9.000 9.000	120 0.0030	36.166 0.0 0.027			Vel = 1.98
530 to 531	21.03 21.03		-5.45 46.16	3 3.26		9.000 9.000	120 0.0024	36.193 0.0 0.022			Vel = 1.77
531 to 532	21.03 21.03		-1.55 44.61	3 3.26		8.000 8.000	120 0.0024	36.215 0.0 0.019			Vel = 1.71
532 to 533	21.03 21.03		3.66 48.27	3 3.26		8.000 8.000	120 0.0026	36.234 0.0 0.021			Vel = 1.86
533 to 534	21.03 21.03		-2.20 46.07	3 3.26		10.500 10.500	120 0.0024	36.255 0.0 0.025			Vel = 1.77
534 to 535	21.03 21.03		-1.88 44.19	3 3.26		10.500 10.500	120 0.0023	36.280 0.0 0.024			Vel = 1.70
535 to 536	21.03 21.03		-1.67 42.52	3 3.26		10.500 10.500	120 0.0021	36.304 0.0 0.022			Vel = 1.63

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 7
Date 050124

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	*****
536 to 537	21.03 21.03		-1.53 40.99	3 3.26			10.500 10.500	120 0.0020	36.326 0.0 0.021		Vel = 1.58	
537 to 538	21.03 21.03		-1.50 39.49	3 3.26			10.500 10.500	120 0.0018	36.347 0.0 0.019		Vel = 1.52	
538 to 539	21.03 21.03		-1.58 37.91	3 3.26			10.500 10.500	120 0.0017	36.366 0.0 0.018		Vel = 1.46	
539 to 540	21.03 21.03		-1.75 36.16	3 3.26			10.500 10.500	120 0.0015	36.384 0.0 0.016		Vel = 1.39	
540 to 541	21.03 21.03		-2.01 34.15	3 3.26			10.500 10.500	120 0.0014	36.400 0.0 0.015		Vel = 1.31	
541 to 542	21.03 21.03		-2.34 31.81	3 3.26			10.500 10.500	120 0.0012	36.415 0.0 0.013		Vel = 1.22	
542 to 543	21.03 21.03		-3.95 27.86	3 3.26			10.500 10.500	120 0.0010	36.428 0.0 0.010		Vel = 1.07	
543 to 544	21.03 21.03		-3.66 24.2	3 3.26			10.500 10.500	120 0.0008	36.438 0.0 0.008		Vel = 0.93	
544 to 545	21.03 21.03		-3.41 20.79	3 3.26			7.500 7.500	120 0.0005	36.446 0.0 0.004		Vel = 0.80	
545 to 546	21.03 21.03		-3.11 17.68	3 3.26			13.500 13.500	120 0.0004	36.450 0.0 0.005		Vel = 0.68	
546 to 547	21.03 21.03		-3.07 14.61	3 3.26			6.170 6.170	120 0.0003	36.455 0.0 0.002		Vel = 0.56	
547 to 548	21.03 21.03		-3.01 11.6	3 3.26			9.000 9.000	120 0.0002	36.457 0.0 0.002		Vel = 0.45	
548 to 549	21.03 21.03		-2.94 8.66	3 3.26			10.000 10.000	120 0.0001	36.459 0.0 0.001		Vel = 0.33	
549 to 550	21.03 21.03		-2.90 5.76	3 3.26			10.000 10.000	120 0	36.460 0.0 0.0		Vel = 0.22	
550 to 551	21.03 21.03		-2.88 2.88	3 3.26			9.000 9.000	120 0	36.460 0.0 0.0		Vel = 0.11	
551 to 552	21.03 19.59		0.0 2.88	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0004	36.460 0.624 0.048		Vel = 0.42	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 8
Date 050124

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	*****
552 to 553	19.59 18.76		0.0 2.88	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	37.132 0.359 0.005	Vel =	0.42
553 to 554	18.76 18.76		0.0 2.88	4 4.26			9.000 9.000	120 0	37.496 0.0 0.0	Vel =	0.06
554 to 555	18.76 18.76		2.88 5.76	4 4.26			10.000 10.000	120 0	37.496 0.0 0.0	Vel =	0.13
555 to 556	18.76 18.76		2.90 8.66	4 4.26			10.000 10.000	120 0	37.496 0.0 0.0	Vel =	0.19
556 to 557	18.76 18.76		2.94 11.6	4 4.26			9.000 9.000	120 0.0001	37.496 0.0 0.001	Vel =	0.26
557 to 558	18.76 18.76		3.01 14.61	4 4.26			6.170 6.170	120 0	37.497 0.0 0.0	Vel =	0.33
558 to 559	18.76 18.76		3.07 17.68	4 4.26			10.500 10.500	120 0.0001	37.497 0.0 0.001	Vel =	0.40
559 to 560	18.76 18.76		3.11 20.79	4 4.26			10.500 10.500	120 0.0002	37.498 0.0 0.002	Vel =	0.47
560 to 561	18.76 18.76		3.41 24.2	4 4.26			10.500 10.500	120 0.0002	37.500 0.0 0.002	Vel =	0.54
561 to 562	18.76 18.76		3.66 27.86	4 4.26			10.500 10.500	120 0.0003	37.502 0.0 0.003	Vel =	0.63
562 to 525	18.76 18.76		3.95 31.81	4 4.26	T	26.334	2.000 26.334 28.334	120 0.0003	37.505 0.0 0.009	Vel =	0.72
525 to 526	18.76 16.58		90.91 122.72	6 6.357	E	17.603	180.010 17.603 197.613	120 0.0006	37.514 0.944 0.115	Vel =	1.24
526 to TR5	16.58 16.41		0.0 122.72	6 6.357	6E	105.616	412.050 105.616 517.666	120 0.0006	38.573 0.074 0.298	Vel =	1.24
TR5 to BR5	16.41 2.830		0.0 122.72	6 6.357	T G	37.72 3.772	13.570 41.492 55.062	120 0.0006	38.945 5.882 0.031	Vel =	1.24
BR5 to BR4	2.830 2.83		0.0 122.72	6 6.357			1.833 1.833	120 0.0005	44.858 0.0 0.001	Vel =	1.24
BR4 to BR3	2.83 2.83		0.0 122.72	4 4.26			1.250 1.250	120 0.0040	44.859 0.0 0.005	Vel =	2.76

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 9
Date 050124

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	*****
BR3 to 127	2.83 2.792		0.0 122.72	4 4.26	T	26.334	3.170 26.334 29.504	120 0.0041	44.864 0.016 0.120			
127 to 128	2.792 2		0.0 122.72	6 6.357	E	17.603	2.375 17.603 19.978	120 0.0006	45.000 0.343 0.012		Vel = 2.76	
128 to PO	2 1.080		0.0 122.72	8 8.249	7E T B S	147.988 41.108 14.094 52.853	31.833 256.043 287.876	120 0.0002	45.355 0.398 0.047		Vel = 1.24	
PO			0.0 122.72						45.800		K Factor = 18.13	
System Demand Pressure									45.800			
Safety Margin									78.091			
Continuation Pressure									123.891			
Pressure @ Pump Outlet									123.891			
Pressure From Pump Curve									-88.894			
Pressure @ Pump Inlet									34.997			
PI to FLG	1.080 -5		0.0 122.72	8 8.249	5E G	105.706 4.698	28.750 110.404 139.154	120 0.0002	34.997 2.633 0.022		Vel = 0.74	
FLG to TEST	-5 -2		0.0 122.72	8 8.27	Zfh 2E	0.0 56.936	169.140 56.936 226.076	140 0.0001	37.652 5.007 0.028		* * Fixed Loss = 6.307 Vel = 0.73	
TEST			250.00 372.72						42.687		Qa = 250.00 K Factor = 57.05	
527 to 528	20.11 20.04		9.73 9.73	3 3.26			6.000 6.000	120 0.0002	36.275 0.030 0.001		Vel = 0.37	
528 to 529	20.04 19.9	10.19	61.37 71.1	3 3.26			11.000 11.000	120 0.0055	36.306 0.061 0.060		K = K @ EQ03 Vel = 2.73	
529 to 564	19.9 19.79		0.0 71.1	3 3.26			9.000 9.000	120 0.0053	36.427 0.048 0.048		Vel = 2.73	
564 to 563	19.79 19.59		0.0 71.1	3 3.26	T	20.159	16.840 20.159 36.999	120 0.0054	36.523 0.087 0.201		Vel = 2.73	
563 to 513	19.59 19.59		0.0 71.1	4 4.26			9.000 9.000	120 0.0014	36.811 0.0 0.013		Vel = 1.60	
513 to 514	19.59 19.59		5.46 76.56	4 4.26			9.000 9.000	120 0.0018	36.824 0.0 0.016		Vel = 1.72	
514 to 515	19.59 19.59		1.54 78.1	4 4.26			8.000 8.000	120 0.0018	36.840 0.0 0.014		Vel = 1.76	
515 to 516	19.59 18.76		-3.66 74.44	4 4.26	2E	26.334	8.830 26.334 35.164	120 0.0016	36.854 0.359 0.057		Vel = 1.68	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 10
Date 050124

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	*****
516 to 517	18.76 18.76		2.20 76.64	4 4.26			10.500 10.500	120 0.0016	37.270 0.0 0.017		Vel = 1.73	
517 to 518	18.76 18.76		1.89 78.53	4 4.26			10.500 10.500	120 0.0018	37.287 0.0 0.019		Vel = 1.77	
518 to 519	18.76 18.76		1.66 80.19	4 4.26			10.500 10.500	120 0.0018	37.306 0.0 0.019		Vel = 1.81	
519 to 520	18.76 18.76		1.53 81.72	4 4.26			10.500 10.500	120 0.0020	37.325 0.0 0.021		Vel = 1.84	
520 to 521	18.76 18.76		1.51 83.23	4 4.26			10.500 10.500	120 0.0019	37.346 0.0 0.020		Vel = 1.87	
521 to 522	18.76 18.76		1.58 84.81	4 4.26			10.500 10.500	120 0.0021	37.366 0.0 0.022		Vel = 1.91	
522 to 523	18.76 18.76		1.75 86.56	4 4.26			10.500 10.500	120 0.0021	37.388 0.0 0.022		Vel = 1.95	
523 to 524	18.76 18.76		2.01 88.57	4 4.26			10.500 10.500	120 0.0022	37.410 0.0 0.023		Vel = 1.99	
524 to 525	18.76 18.76		2.33 90.9	4 4.26	T	26.334	8.500 26.334 34.834	120 0.0023	37.433 0.0 0.081		Vel = 2.05	
525			0.0 90.90						37.514		K Factor = 14.84	
530 to 565	21.03 20.17		5.45 5.45	3 3.26	T	20.159	71.160 20.159 91.319	120 0.0001	36.193 0.372 0.005		Vel = 0.21	
565 to 566	20.17 20.04		0.0 5.45	3 3.26			11.000 11.000	120 0.0001	36.570 0.056 0.001		Vel = 0.21	
566 to 567	20.04 19.9		0.0 5.45	3 3.26			11.000 11.000	120 0	36.627 0.061 0.0		Vel = 0.21	
567 to 605	19.9 19.79		0.0 5.45	3 3.26			9.000 9.000	120 0	36.688 0.048 0.0		Vel = 0.21	
605 to 513	19.79 19.59		0.0 5.45	3 3.26	T	20.159	16.930 20.159 37.089	120 0	36.736 0.087 0.001		Vel = 0.21	
513			0.0 5.45						36.824		K Factor = 0.90	
531 to 606	21.03 19.79		1.55 1.55	3 3.26	T	20.159	102.160 20.159 122.319	120 0	36.215 0.537 0.001		Vel = 0.06	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 11
Date 050124

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	*****
606 to 514	19.79 19.59		0.0 1.55	3 3.26	T 20.159	16.840 20.159 36.999	120 0	36.753 0.087 0.0		Vel = 0.06	
514			0.0 1.55					36.840		K Factor = 0.26	
515 to 532	19.59 21.03		3.66 3.66	3 3.26	2T 40.319	119.000 40.319 159.319	120 0	36.854 -0.624 0.004		Vel = 0.14	
532			0.0 3.66					36.234		K Factor = 0.61	
533 to 597	21.03 20.47		2.20 2.2	1.5 1.682	T 9.9	46.500 9.900 56.400	120 0.0002	36.255 0.243 0.012		Vel = 0.32	
597 to 596	20.47 20.33		0.0 2.2	1.5 1.682		11.000 11.000	120 0.0002	36.510 0.061 0.002		Vel = 0.32	
596 to 598	20.33 20.2		0.0 2.2	1.5 1.682		11.000 11.000	120 0.0002	36.573 0.056 0.002		Vel = 0.32	
598 to 599	20.2 20.06		0.0 2.2	1.5 1.682		11.500 11.500	120 0.0003	36.631 0.061 0.003		Vel = 0.32	
599 to 569	20.06 19.59		0.0 2.2	1.5 1.682	E 4.95	39.010 4.950 43.960	120 0.0002	36.695 0.204 0.009		Vel = 0.32	
569 to 516	19.59 18.76		0.0 2.2	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0003	36.908 0.359 0.003		Vel = 0.32	
516			0.0 2.20					37.270		K Factor = 0.36	
534 to 600	21.03 20.47		1.89 1.89	1.5 1.682	T 9.9	46.500 9.900 56.400	120 0.0002	36.280 0.243 0.009		Vel = 0.27	
600 to 601	20.47 20.33		0.0 1.89	1.5 1.682		11.000 11.000	120 0.0002	36.532 0.061 0.002		Vel = 0.27	
601 to 602	20.33 20.2		0.0 1.89	1.5 1.682		11.000 11.000	120 0.0002	36.595 0.056 0.002		Vel = 0.27	
602 to 603	20.2 20.06		0.0 1.89	1.5 1.682		11.500 11.500	120 0.0001	36.653 0.061 0.001		Vel = 0.27	
603 to 570	20.06 19.59		0.0 1.89	1.5 1.682	E 4.95	39.010 4.950 43.960	120 0.0002	36.715 0.204 0.007		Vel = 0.27	
570 to 517	19.59 18.76		0.0 1.89	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0002	36.926 0.359 0.002		Vel = 0.27	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 12
Date 050124

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	*****
517			0.0 1.89						37.287		K Factor = 0.31	
535 to 604	21.03 20.06		1.66 1.66	1.5 1.682	T	9.9	80.000 9.900 89.900	120 0.0001	36.304 0.420 0.012		Vel = 0.24	
604 to 571	20.06 19.59		0.0 1.66	1.5 1.682	E	4.95	39.010 4.950 43.960	120 0.0001	36.736 0.204 0.005		Vel = 0.24	
571 to 518	19.59 18.76		0.0 1.66	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0002	36.945 0.359 0.002		Vel = 0.24	
518			0.0 1.66						37.306		K Factor = 0.27	
536 to 572	21.03 19.59		1.53 1.53	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0001	36.326 0.624 0.015		Vel = 0.22	
572 to 519	19.59 18.76		0.0 1.53	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0001	36.965 0.359 0.001		Vel = 0.22	
519			0.0 1.53						37.325		K Factor = 0.25	
537 to 573	21.03 19.59		1.50 1.5	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0001	36.347 0.624 0.014		Vel = 0.22	
573 to 520	19.59 18.76		0.0 1.5	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0002	36.985 0.359 0.002		Vel = 0.22	
520			0.0 1.50						37.346		K Factor = 0.25	
538 to 574	21.03 19.59		1.58 1.58	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0001	36.366 0.624 0.016		Vel = 0.23	
574 to 521	19.59 18.76		0.0 1.58	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0001	37.006 0.359 0.001		Vel = 0.23	
521			0.0 1.58						37.366		K Factor = 0.26	
539 to 575	21.03 19.59		1.75 1.75	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0001	36.384 0.624 0.019		Vel = 0.25	
575 to 522	19.59 18.76		0.0 1.75	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0002	37.027 0.359 0.002		Vel = 0.25	
522			0.0 1.75						37.388		K Factor = 0.29	
540 to 576	21.03 19.59		2.01 2.01	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0002	36.400 0.624 0.025		Vel = 0.29	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 13
Date 050124

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	*****
576 to 523	19.59 18.76		0.0 2.01	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0002	37.049 0.359 0.002		Vel = 0.29	
523			0.0 2.01						37.410		K Factor = 0.33	
541 to 577	21.03 19.59		2.33 2.33	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0002	36.415 0.624 0.032		Vel = 0.34	
577 to 524	19.59 18.76		0.0 2.33	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0003	37.071 0.359 0.003		Vel = 0.34	
524			0.0 2.33						37.433		K Factor = 0.38	
542 to 578	21.03 19.59		3.96 3.96	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0006	36.428 0.624 0.086		Vel = 0.57	
578 to 562	19.59 18.76		0.0 3.96	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0007	37.138 0.359 0.008		Vel = 0.57	
562			0.0 3.96						37.505		K Factor = 0.65	
543 to 579	21.03 19.59		3.66 3.66	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0006	36.438 0.624 0.075		Vel = 0.53	
579 to 561	19.59 18.76		0.0 3.66	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0006	37.137 0.359 0.006		Vel = 0.53	
561			0.0 3.66						37.502		K Factor = 0.60	
544 to 580	21.03 19.59		3.41 3.41	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0005	36.446 0.624 0.065		Vel = 0.49	
580 to 560	19.59 18.76		0.0 3.41	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0006	37.135 0.359 0.006		Vel = 0.49	
560			0.0 3.41						37.500		K Factor = 0.56	
545 to 581	21.03 19.59		3.11 3.11	1.5 1.682	T 3E	9.9 14.849	122.010 24.749 146.759	120 0.0004	36.450 0.624 0.060		Vel = 0.45	
581 to 559	19.59 18.76		0.0 3.11	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0005	37.134 0.359 0.005		Vel = 0.45	
559			0.0 3.11						37.498		K Factor = 0.51	
546 to 582	21.03 19.59		3.07 3.07	1.5 1.682	T E	9.9 4.95	119.010 14.850 133.860	120 0.0004	36.455 0.624 0.055		Vel = 0.44	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 14
Date 050124

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	*****
582 to 558	19.59 18.76		0.0 3.07	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0004	37.134 0.359 0.004		Vel = 0.44	
558			0.0 3.07					37.497		K Factor = 0.50	
547 to 592	21.03 20.49		3.01 3.01	1.5 1.682	T 9.9	45.000 9.900 54.900	120 0.0004	36.457 0.234 0.021		Vel = 0.43	
592 to 593	20.49 20.35		0.0 3.01	1.5 1.682		11.000 11.000	120 0.0004	36.712 0.061 0.004		Vel = 0.43	
593 to 594	20.35 20.2		0.0 3.01	1.5 1.682		13.000 13.000	120 0.0004	36.777 0.065 0.005		Vel = 0.43	
594 to 595	20.2 20.04		0.0 3.01	1.5 1.682		12.500 12.500	120 0.0005	36.847 0.069 0.006		Vel = 0.43	
595 to 583	20.04 19.59		0.0 3.01	1.5 1.682	E 4.95	37.500 4.950 42.450	120 0.0004	36.922 0.195 0.016		Vel = 0.43	
583 to 557	19.59 18.76		0.0 3.01	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0005	37.133 0.359 0.005		Vel = 0.43	
557			0.0 3.01					37.497		K Factor = 0.49	
548 to 588	21.03 20.49		2.94 2.94	1.5 1.682	T 9.9	45.000 9.900 54.900	120 0.0004	36.459 0.234 0.020		Vel = 0.42	
588 to 587	20.49 20.35		0.0 2.94	1.5 1.682		11.000 11.000	120 0.0004	36.713 0.061 0.004		Vel = 0.42	
587 to 589	20.35 20.2		0.0 2.94	1.5 1.682		13.000 13.000	120 0.0004	36.778 0.065 0.005		Vel = 0.42	
589 to 590	20.2 20.04		0.0 2.94	1.5 1.682		12.500 12.500	120 0.0004	36.848 0.069 0.005		Vel = 0.42	
590 to 584	20.04 19.59		0.0 2.94	1.5 1.682	E 4.95	37.500 4.950 42.450	120 0.0004	36.922 0.195 0.016		Vel = 0.42	
584 to 556	19.59 18.76		0.0 2.94	1.5 1.682	T 9.9	0.830 9.900 10.730	120 0.0004	37.133 0.359 0.004		Vel = 0.42	
556			0.0 2.94					37.496		K Factor = 0.48	
549 to 591	21.03 20.04		2.90 2.9	1.5 1.682	T 9.9	81.500 9.900 91.400	120 0.0004	36.460 0.429 0.033		Vel = 0.42	

Final Calculations : Hazen-Williams

Telgian E&C
WM 2403 PUYALLUP WA

Page 15
Date 050124

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	*****
591 to 585	20.04 19.59		0.0 2.9	1.5 1.682	E	4.95	37.500 4.950 42.450	120 0.0004	36.922 0.195 0.016		Vel = 0.42	
585 to 555	19.59 18.76		0.0 2.9	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0004	37.133 0.359 0.004		Vel = 0.42	
555			0.0 2.90						37.496		K Factor = 0.47	
550 to 586	21.03 19.59		2.88 2.88	1.5 1.682	T E	9.9 4.95	119.000 14.850 133.850	120 0.0004	36.460 0.624 0.049		Vel = 0.42	
586 to 554	19.59 18.76		0.0 2.88	1.5 1.682	T	9.9	0.830 9.900 10.730	120 0.0004	37.133 0.359 0.004		Vel = 0.42	
554			0.0 2.88						37.496		K Factor = 0.47	