

... Fire Protection by Computer Design

ABL FIRE PROTECTION  
RALEIGH, NORTH CAROLINA

Job Name : SOLEIL LOW ZONE STANDPIPE  
Building :  
Location : 4501 CREEDMOOR ROAD RALEIGH, NORTH CAROLINA  
System : LOW STANDPIP  
Contract :  
Data File : SOLEIL LOW ZONE STANDPIPE.WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - SOLEIL CENTER Date - 11-25-07  
 Location - 4501 CREEDMOOR ROAD RALEIGH, NORTH CAROLINA  
 Building - System No. - LOW STANDPIP  
 Contractor - Contract No. -  
 Calculated By - JSB Drawing No. - FP-5  
 Occupancy - RESIDENTIAL

S (X)NFPA 14 Number of Standpipes ( )1 ( )2 (X)3 ( )4 ( )  
 Y ( )Other  
 S ( )Specific Ruling Made by Date

E	Flow at Top Most Outlet	- 500	Gpm	System Type
M	Pres. at Top Most Outlet	- 125	Psi	(X) Wet ( ) Dry
	Flow For Ea. Additional Standpipe	- 250	Gpm	
D	Total Additional Flow	- 500	Gpm	
E	Elevation at Highest Outlet	- 204	Feet	
S	Hose Valve Connection	( )1 1/2" (X)2 1/2"		
I	Class Service	( )I ( )II (X)III		
G	Note:			
N				

Calculation	Gpm Required 1000	Psi Required 221.64	AT PUMP DISCHARGE
Summary	C-Factor Used:	Overhead 120	Underground 140

W	Water Flow Test:	Pump Data:	Tank or Reservoir:
A	Date of Test -		Cap.
T	Time of Test -	Rated Cap. 1000	Elev.
E	Static (Psi) - 106	@ Psi 180	
R	Residual (Psi) - 92	Elev. 17.5	Well
	Flow (Gpm) - 1470		Proof Flow Gpm
S	Elevation - 0		

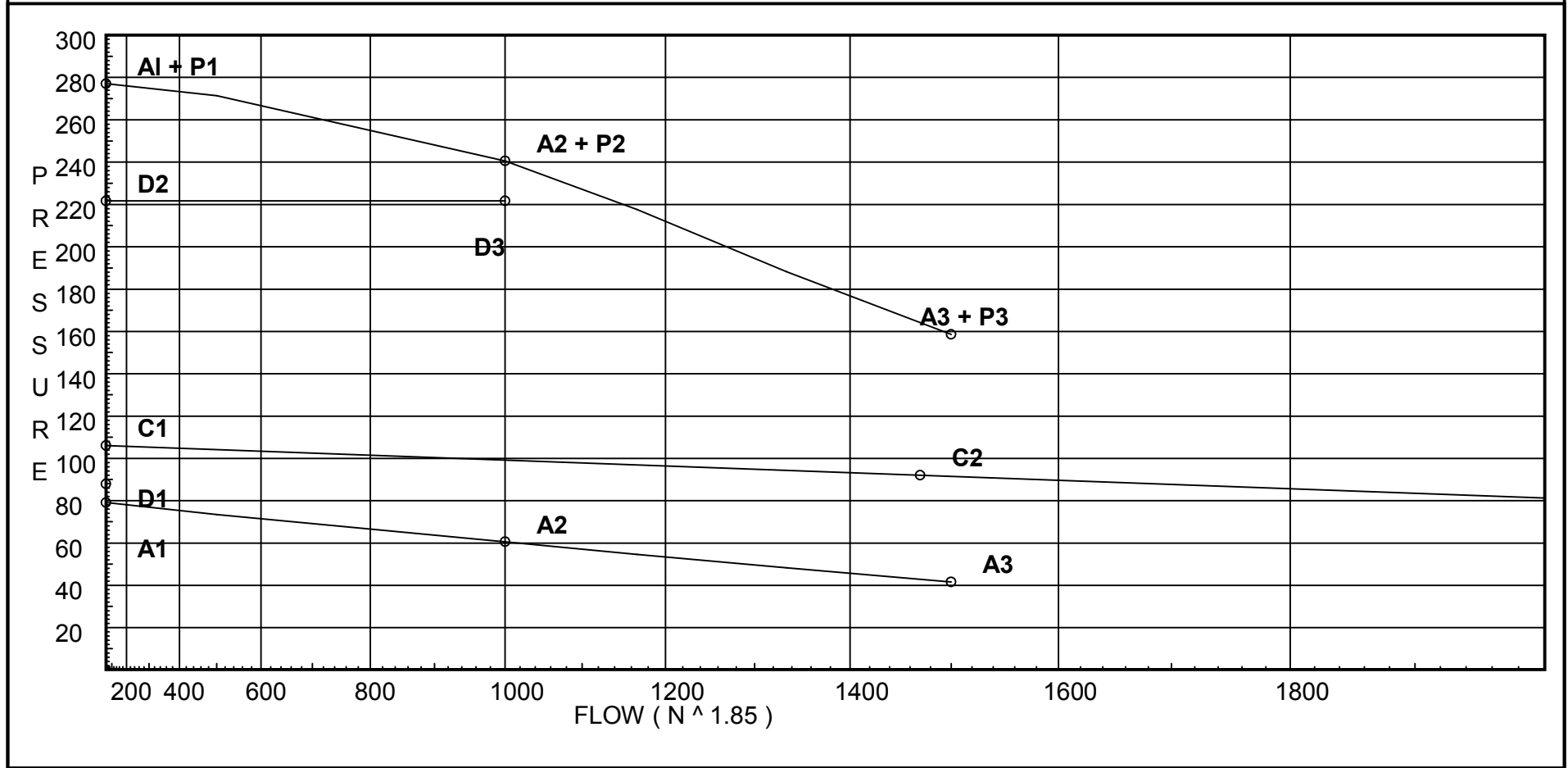
U  
 P Location:  
 P  
 L Source of Information:  
 Y

# Water Supply Curve (C)

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<b>City Water Supply:</b> C1 - Static Pressure : 106 C2 - Residual Pressure: 92 C2 - Residual Flow : 1470  <b>City Water Adjusted to Pump Inlet for Pf - Elev - Hose Flow</b> A1 - Adjusted Static: 79.127 A2 - Adj Resid : 60.611 @ 1000 A3 - Adj Resid : 41.562 @ 1500	<b>Pump Data:</b> P1 - Pump Churn Pressure : 198 P2 - Pump Rated Pressure : 180 P2 - Pump Rated Flow : 1000 P3 - Pump Pressure @ Max Flow : 117 P3 - Pump Max Flow : 1500 City Residual Flow @ 0 = 4390.85 City Residual Flow @ 20 = 3921.60 City Water @ 150% of Pump = 91.47	<b>Demand:</b> D1 - Elevation : 87.919 D2 - System Flow : D2 - System Pressure : 221.640 Hose ( Adj City ) : 720 Hose ( Demand ) : 1000 D3 - System Demand : 1000 Safety Margin : 18.971
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# Fittings Used Summary

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Fitting Legend																					
Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
B	Generic Butterfly Valve	0	0	0	0	0	0	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E	90' Standard Elbow	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	Generic Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
S	Generic Swing Check Valve	4	5	5	7	9	11	14	16	19	22	27	32	45	55	65	76	87	98	109	130
T	90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
Zaf	Ames 3000SS	Fitting generates a Fixed Loss Based on Flow																			
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

Pressure / Flow Summary - STANDARD

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Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
STD3	204.0		125.0	na	500.0			
STD4	204.0		126.56	na	250.0			
STD5	184.0		135.26	na	250.0			
LZT	24.5		204.9	na				
CON	17.5		209.53	na				
LZD	17.5		221.64	na				
LZS	17.5		60.61	na				
RED	17.5		62.4	na				
MF4	3.0		69.22	na				
DI	1.0		80.54	na				
HDI	-3.0		83.15	na				
HD2	-3.0		84.23	na	720.0			
POC	1.0		87.28	na				

The maximum velocity is 10.11 and it occurs in the pipe between nodes LZT and CON

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	***** Notes *****
STD3	500.00	6.357	2T 75.44	172.000	125.000		Qa = 500
to		120	1B 12.573	105.616	77.742		
LZT	500.0	0.0078	1E 17.603	277.616	2.154		Vel = 5.05
	0.0						
	500.00				204.896		K Factor = 34.93
STD4	250.00	6.357	2T 75.44	172.000	126.557		Qa = 250
to		120	1B 12.573	105.616	77.742		
LZT	250.0	0.0022	1E 17.603	277.616	0.597		Vel = 2.53
	0.0						
	250.00				204.896		K Factor = 17.47
STD5	250.00	6.357	2T 75.44	152.000	135.262		Qa = 250
to		120	1B 12.573	105.616	69.079		
LZT	250.0	0.0022	1E 17.603	257.616	0.555		Vel = 2.53
LZT	750.00	6.357	1T 37.72	7.000	204.896		
to		120	1B 12.573	50.293	3.032		
CON	1000.0	0.0280	0.0	57.293	1.603		Vel = 10.11
CON	0.0	6.357	1S 40.235	5.000	209.531		
to		120	1E 17.603	70.411	10.000		* Fixed loss = 10
LZD	1000.0	0.0280	1B 12.573	75.411	2.109		Vel = 10.11
	0.0						
	1000.00				221.640		K Factor = 67.17
System Demand Pressure					221.640		
Safety Margin					18.971		
Continuation Pressure					240.611		
Pressure @ Pump Outlet					240.611		
Pressure From Pump Curve					-179.999		
Pressure @ Pump Inlet					60.612		
LZS	0.0	6.357	1E 17.603	5.000	60.612		
to		120	1G 3.772	59.095	0.0		
RED	1000.0	0.0280	1T 37.72	64.095	1.793		Vel = 10.11
RED	0.0	8.249	1B 14.094	12.500	62.405		
to		120	1T 41.108	55.202	6.280		
MF4	1000.0	0.0079	0.0	67.702	0.532		Vel = 6.00
MF4	0.0	8.249	1Zai 0.0	1.000	69.217		
to		120	1E 21.141	21.141	11.152		* Fixed loss = 10.286
DI	1000.0	0.0079	0.0	22.141	0.174		Vel = 6.00
DI	0.0	8.27	1F 14.234	45.000	80.543		
to		140	1G 6.326	104.382	1.732		
HDI	1000.0	0.0058	1T 55.354	149.382	0.873		Vel = 5.97
			1E 28.468				
HDI	0.0	10.28	2F 33.148	420.000	83.148		
to		140	1T 75.336	116.018	0.0		
HD2	1000.0	0.0020	1G 7.534	536.018	1.086		Vel = 3.87

Hyd. Ref. Point	Qa  Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****  Notes *****
HD2	720.00	10.28	1F 16.574	131.000	84.234		Qa = 720
to		140	2G 15.067	31.641	2.148		* Fixed loss = 3.88
POC	1720.0	0.0055	1Zaf 0.0	162.641	0.898		Vel = 6.65
	0.0						
	1720.00				87.280		K Factor = 184.11