Sprinkler System – Design Data

WATER TREATMENT PLANT
Fire Sprinkler Reports

for

US Navy

670 Seamans Neck Rd.
Seaford, NY 11783

Prepared By:

Thomas Kenny, P.E.

KG Mechanical

162 Milbar Blvd.

Farmingdale, NY 11735

631-777-2627

February 16, 2013

General Project Data Report

General Data

Project Title:	Water Treatment Plant	Project File Name:	373-Water Treatment Plant..fiw
Designed By:	Thomas Kenny, P.E.	Date:	February 16, 2013
Code Reference:	NFPA 13-2007	Approving Agency:	NCFM
Client Name:	US Navy	Phone:	
Address:	670 Seamans Neck Rd.	City, State Zip Code:	Seaford, NY 11783
Company Name:	KG Mechanical	Representative:	Ken Gordon
Company Address:	162 Milbar Blvd.	City And State:	Farmingdale, NY 11735
Phone:	631-777-2627		
Building Name:	Water Treatment Plant	Building Owner:	US Navy
Contact at Building:		Phone at Building:	
Address Of Building:	670 Seamans Neck Rd	City, State Zip Code:	Seaford, NY 11783

Project Data

Description Of Hazard:	Light Hazard		Sprinkler System Type:	Wet	
Design Area Of Water Application:	1950	ft²	Maximum Area Per Sprinkler:	130	ft²
Default Sprinkler K-Factor:	5.60	K	Default Pipe Material:	SCHED 40 WET STEEL	
Inside Hose Stream Allowance:	0.00	gpm	Outside Hose Stream Allowance:	250.00	gpm
In Rack Sprinkler Allowance:	0.00	gpm			

Sprinkler Specifications

Make:	Reliable		Model:	F1FR	
Size:	1/2"		Temperature Rating:	165	F

Water Supply Test Data

Source Of Information:					
Test Hydrant ID:			Date Of Test:		
Hydrant Elevation:	0	ft	Static Pressure:	65.00	psi
Test Flow Rate:	1060.00	gpm	Test Residual Pressure:	53.00	psi
Calculated System Flow Rate:	726.52	gpm	Calculated Inflow Residual Pressure:	42.74	psi
Available Residual Pressure At System Flow:	59.03	psi			

Calculation Project Data

Calculation Mode:	Demand				
HMD Minimum Residual Pressure:	7.00	psi	Minimum Desired Flow Density:	0.20	gpm/ft²
Number Of Active Nodes:	41				
Number Of Active Pipes:	40		Number Of Inactive Pipes:	0	
Number Of Active Sprinklers:	23		Number Of Inactive Sprinklers:	0	

Fire Sprinkler Output Data

Overall Pipe Output Data

Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
10	5.60	27.00	18.40	10.80	1.25	18.40	0.02934	8.75	0.257
20	5.60	25.00	19.33	11.92	1.380	18.40	-----	0.00	0.866
	SCHED 40 WET STEEL				120	3.95	0	8.75	1.123
20	5.60	25.00	19.33	11.92	1.25	19.33	0.11081	1.75	1.524
30	0.00	23.00	0.00	14.31	1.380	37.73	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	8.09	0	13.75	2.390
40	5.60	27.00	18.41	10.81	1.25	18.41	0.02938	8.75	0.257
50	5.60	25.00	19.35	11.93	1.380	18.41	-----	0.00	0.866
	SCHED 40 WET STEEL				120	3.95	0	8.75	1.123
30	0.00	23.00	0.00	14.31	3.00	0.00	0.00168	10.50	0.018
60	0.00	23.00	0.00	14.33	3.260	37.73	-----	0.00	0.000
	SCHED 10 WET STEEL				120	1.45	0	10.50	0.018
50	5.60	25.00	19.35	11.93	1.25	19.35	0.11096	1.75	1.526
60	0.00	23.00	0.00	14.33	1.380	37.76	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	8.10	0	13.75	2.392
70	5.60	27.00	18.46	10.87	1.25	18.46	0.02952	8.75	0.258
80	5.60	25.00	19.39	11.99	1.380	18.46	-----	0.00	0.866
	SCHED 40 WET STEEL				120	3.96	0	8.75	1.124
60	0.00	23.00	0.00	14.33	3.00	0.00	0.00608	10.50	0.064
90	0.00	23.00	0.00	14.39	3.260	75.49	-----	0.00	0.000
	SCHED 10 WET STEEL				120	2.90	0	10.50	0.064
80	5.60	25.00	19.39	11.99	1.25	19.39	0.11146	1.75	1.533
90	0.00	23.00	0.00	14.39	1.380	37.85	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	8.12	0	13.75	2.399
100	5.60	27.00	18.56	10.98	1.25	18.56	0.02982	8.75	0.261
110	5.60	25.00	19.49	12.11	1.380	18.56	-----	0.00	0.866
	SCHED 40 WET STEEL				120	3.98	0	8.75	1.127
90	0.00	23.00	0.00	14.39	3.00	0.00	0.01289	10.50	0.135
120	0.00	23.00	0.00	14.53	3.260	113.34	-----	0.00	0.000
	SCHED 10 WET STEEL				120	4.36	0	10.50	0.135
110	5.60	25.00	19.49	12.11	1.25	19.49	0.11254	1.75	1.547
120	0.00	23.00	0.00	14.53	1.380	38.05	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	8.16	0	13.75	2.413
130	5.60	27.00	18.73	11.19	1.25	18.73	0.03033	8.75	0.265
140	5.60	25.00	19.65	12.32	1.380	18.73	-----	0.00	0.866
	SCHED 40 WET STEEL				120	4.02	0	8.75	1.131

Fire Sprinkler Output Data

Overall Pipe Output Data (cont'd)

Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
120	0.00	23.00	0.00	14.53	3.00	0.00	0.02202	10.50	0.231
150	0.00	23.00	0.00	14.76	3.260	151.39	-----	0.00	0.000
	SCHED 10 WET STEEL				120	5.82	0	10.50	0.231
140	5.60	25.00	19.65	12.32	1.25	19.65	0.11438	1.75	1.573
150	0.00	23.00	0.00	14.76	1.380	38.38	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	8.23	0	13.75	2.439
160	5.60	27.00	18.98	11.49	1.25	18.98	0.03109	8.75	0.272
170	5.60	25.00	19.90	12.63	1.380	18.98	-----	0.00	0.866
	SCHED 40 WET STEEL				120	4.07	0	8.75	1.138
150	0.00	23.00	0.00	14.76	3.00	0.00	0.03345	10.50	0.351
180	0.00	23.00	0.00	15.11	3.260	189.78	-----	0.00	0.000
	SCHED 10 WET STEEL				120	7.29	0	10.50	0.351
170	5.60	25.00	19.90	12.63	1.25	19.90	0.11716	1.75	1.611
180	0.00	23.00	0.00	15.11	1.380	38.89	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	8.34	0	13.75	2.477
190	5.60	27.00	20.84	13.86	1.25	20.84	0.03696	8.75	0.323
200	5.60	25.00	21.72	15.04	1.380	20.84	-----	0.00	0.866
	SCHED 40 WET STEEL				120	4.47	0	8.75	1.189
180	0.00	23.00	0.00	15.11	3.00	0.00	0.04722	39.33	2.707
210	0.00	23.00	0.00	17.81	3.260	228.66	2E	18.00	0.000
	SCHED 10 WET STEEL				120	8.79	0	57.33	2.707
200	5.60	25.00	21.72	15.04	1.25	21.72	0.13849	1.75	1.904
210	0.00	23.00	0.00	17.81	1.380	42.57	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	9.13	0	13.75	2.770
220	5.60	27.00	21.29	14.45	1.25	21.29	0.03843	8.75	0.336
230	5.60	25.00	22.15	15.65	1.380	21.29	-----	0.00	0.866
	SCHED 40 WET STEEL				120	4.57	0	8.75	1.202
210	0.00	23.00	0.00	17.81	3.00	0.00	0.06476	10.50	0.680
240	0.00	23.00	0.00	18.49	3.260	271.23	-----	0.00	0.000
	SCHED 10 WET STEEL				120	10.43	0	10.50	0.680
230	5.60	25.00	22.15	15.65	1.25	22.15	0.14381	1.75	1.977
240	0.00	23.00	0.00	18.49	1.380	43.44	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	9.32	0	13.75	2.843
250	5.60	27.00	21.86	15.23	1.25	21.86	0.04035	8.75	0.353
260	5.60	25.00	22.71	16.45	1.380	21.86	-----	0.00	0.866
	SCHED 40 WET STEEL				120	4.69	0	8.75	1.219

Fire Sprinkler Output Data

Overall Pipe Output Data (cont'd)

Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
240	0.00	23.00	0.00	18.49	3.00	0.00	0.08524	10.50	0.895
270	0.00	23.00	0.00	19.39	3.260	314.67	-----	0.00	0.000
	SCHED 10 WET STEEL				120	12.10	0	10.50	0.895
260	5.60	25.00	22.71	16.45	1.25	22.71	0.15079	1.75	2.073
270	0.00	23.00	0.00	19.39	1.380	44.57	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	9.56	0	13.75	2.939
280	5.60	27.00	22.56	16.23	1.25	22.56	0.04279	8.75	0.374
290	5.60	25.00	23.41	17.47	1.380	22.56	-----	0.00	0.866
	SCHED 40 WET STEEL				120	4.84	0	8.75	1.240
270	0.00	23.00	0.00	19.39	3.00	0.00	0.10892	10.50	1.144
300	0.00	23.00	0.00	20.53	3.260	359.24	-----	0.00	0.000
	SCHED 10 WET STEEL				120	13.81	0	10.50	1.144
290	5.60	25.00	23.41	17.47	1.25	23.41	0.15967	1.75	2.196
300	0.00	23.00	0.00	20.53	1.380	45.97	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	9.86	0	13.75	3.062
300	0.00	23.00	0.00	20.53	3.00	0.00	0.13610	9.00	1.225
310	0.00	23.00	0.00	21.76	3.260	405.21	-----	0.00	0.000
	SCHED 10 WET STEEL				120	15.58	0	9.00	1.225
310	0.00	23.00	0.00	21.76	3.00	0.00	0.00547	1.50	0.008
340	0.00	23.00	0.00	21.75	3.260	71.31	-----	0.00	0.000
	SCHED 10 WET STEEL				120	2.74	0	1.50	0.008
320	5.60	27.00	23.29	17.30	1.25	23.29	0.04538	8.75	0.397
330	5.60	25.00	24.12	18.56	1.380	23.29	-----	0.00	0.866
	SCHED 40 WET STEEL				120	5.00	0	8.75	1.263
330	5.60	25.00	24.12	18.56	1.25	24.12	0.16909	1.75	2.325
340	0.00	23.00	0.00	21.75	1.380	47.41	2ET	12.00	0.866
	SCHED 40 WET STEEL				120	10.17	0	13.75	3.191
340	0.00	23.00	0.00	21.75	3.00	0.00	0.00072	10.50	0.008
370	0.00	23.00	0.00	21.74	3.260	23.90	-----	0.00	0.000
	SCHED 10 WET STEEL				120	0.92	0	10.50	0.008
350	5.60	23.00	23.90	18.21	1.00	23.90	0.18100	8.75	1.584
360	0.00	25.00	0.00	18.93	1.049	23.90	-----	0.00	-0.866
	SCHED 40 WET STEEL				120	8.87	0	8.75	0.718
360	0.00	25.00	0.00	18.93	1.00	0.00	0.18100	1.75	1.946
370	0.00	23.00	0.00	21.74	1.049	23.90	2ET	9.00	0.866
	SCHED 40 WET STEEL				120	8.87	0	10.75	2.812

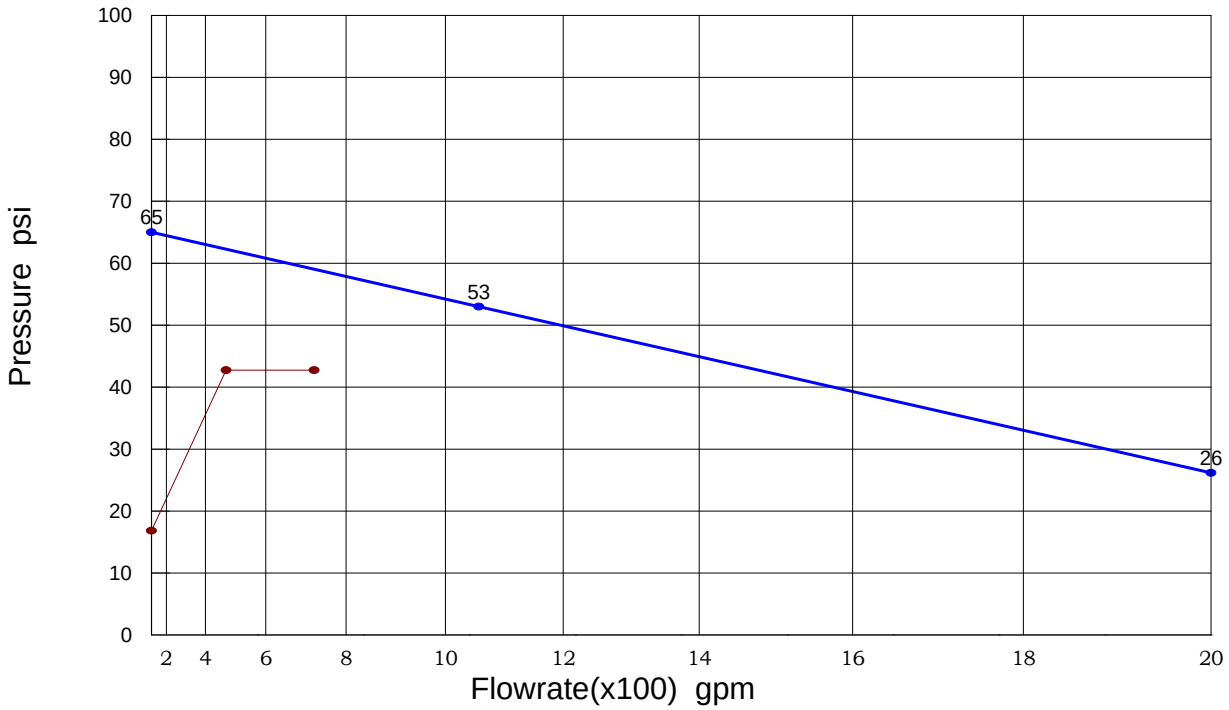
Fire Sprinkler Output Data

Overall Pipe Output Data (cont'd)

Beg. End. Node	Nodal KFactor (K)	Elevation (feet)	Spk/Hose Discharge (gpm)	Residual Pressure (psi)	Nom. Dia. Inside Dia. C-Value	q (gpm) Q (gpm) Velocity (fps)	F. L./ft (psi/ft) Fittings Type-Grp	Pipe-Len. Fit-Len. Tot-Len. (ft)	PF-(psi) PE-(psi) PT-(psi)
310	0.00	23.00	0.00	21.76	4.00	0.00	0.04992	28.00	3.544
900	0.00	0.00	0.00	35.26	4.260	476.52	2E	43.00	9.959
	SCHED 10 WET STEEL				120	10.73	0	71.00	13.503
900	Backflo Prev	0.00		35.26		476.53			
910	6.00 psi	0.00		41.29					
910	0.00	0.00	0.00	41.29	4.00	0.00	0.06573	3.00	0.854
920	0.00	0.00	0.00	42.14	4.026	476.52	E	10.00	0.000
	SCHED 40 WET STEEL				120	12.01	0	13.00	0.854
920	0.00	0.00	0.00	42.14	6.00	0.00	0.00893	20.00	0.599
999	0.00	0.00	0.00	42.74	6.065	476.52	ETG	47.00	0.000
	SCHED 40 WET STEEL				120	5.29	0	67.00	0.599

Fire Sprinkler Output Data

Hydraulic Supply/Demand Graph



Supply Curve Data

Static Pressure: 65 psi
Test Residual Pressure: 53 psi
Test Flow Rate: 1060 gpm

Demand Curve Data

Calculated Residual Pressure: 42.74 psi
Calculated Flow Rate: 726.52 gpm
Exterior Hose Flow: 250.00 gpm
Excess Available Residual Pressure At Calculated Flow: 16.3 psi
Pressure Required For First Sprinkler Downstream From Inflow Node To Flow: 16.83 psi