HILLSIDE GROVE

LIFT STATION #1

DESIGN REPORT

FOR

Lennar Homes - Orlando
6750 Forum Drive, Suite 310
Orlando, FL 32821
(904) 431-6499

PREPARED BY:

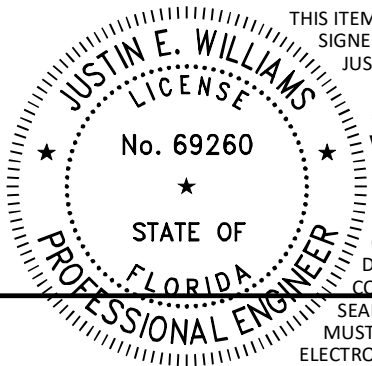
Connelly & Wicker, Inc.
10060 Skinner Lake Drive, Suite 500
Jacksonville, Florida 32246
Florida Registry: 3650 L.A. Number: LC26000311
Phone: (904) 265-3030 Fax: (904) 265-3031
www.cwieng.com

DATE: 10/7/2022

CWI Project No.: 21-04-0008

Table of Contents

		Pages
A	Cover Sheet	1
B	Index Sheet	2
C	Project Summary	3
D	Pump Station #1 Forcemain Calculations	4
E	Pump Station #1 Wetwell Calculations	5
F	Pump Station #1 Buoyancy Calculations	6
G	Pump Station #1 Pump Selection Data	7
H	Pump Station #1 WaterCAD Analysis (Manifold Condition)	
	Network Preview	8
	Junction Report	9
	Pipe Report	10
	Pump Report	11
	Pump Definition Detailed Reports	12 - 23
	Reservior Report	24
	System Head Curve Detailed Report	25 - 26
I	Pump Station #1 WaterCAD Analysis (Runout Condition)	
	Network Preview	27
	Junction Report	28
	Pipe Report	29
	Pump Definition Detailed Report	30 - 31
	Pump Report	32
	Reservior Report	33
	System Head Curve Detailed Report	34 - 35
J	Summary of Required vs Modeled Pump Station Flows	36
APPENDIX		37
Analysis of Existing Network Condition to Establish Manifold Pump Single Design Point Curve		
a.	Existing Network Condition Network Preview	38
b.	Head Condition Pump Report	39
Pump Station #1 Pump Data		
c.	Flygt Pump Data and Performance Curve	40 - 47
Information Provided by Griffey Engineering, Inc and St. Johns River Water Management District		
d.	Wastewater Network Diagram (provided by Griffey Engineering)	48
e.	Wastewater Master Plan Excerpts (Prepared by BESH, provided by Griffey Engineering)	49 - 57
f.	Venezia South Construction Plan Excerpts (From SJRWMD Website)	58 - 61
g.	Venezia North Construction Plans Excerpts (aka. Talichet, From SJRWMD Website)	62 - 64
h.	Town Hall Lift Station Details (Prepared and provided by Griffey Engineering)	65
i.	Lakeshore Lift Station Details (Prepared and provided by Griffey Engineering)	66



THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY JUSTIN E. WILLIAMS

Justin E Williams

Digitally signed by Justin E Williams
DN: cn=Justin E Williams, c=US, o=CONNELLY AND WICKER INC., ou=A01410C000001711228277500015D35, email=jwilliams@cwieng.com
Date: 2022.10.07 11:40:21 -04'00'

ON THE DATE ADJACENT TO THE SEAL. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

Prepared under the direction of

Justin E. Williams, P.E.
PE # 69260

GENERAL SITE DESCRIPTION

THE PROJECT

The proposed development is located within Lake County, Florida (Town of Howey in the Hills) within the Town of Howey in the Hills service area. The project is located west of State Road 19 (South Palm Avenue) and Taylor Memorial Cemetery, north of Revels Road, and south of Number 2 Road. The proposed development will be constructed in 4 phases and include up to 728 single family units. Lift Station #1 will serve up to 640 of the proposed residential units.

PUMP STATION

The pump station is located on the western side of the property and more specifically is located south of Road “K”, North of Road “C” and west of Road “A”. The effluent will pump through a 6” force main to Road A where the forcemain will increase to 10” and extend to Number 2 Road right of way where it will connect to an existing 10” force main, and will ultimately connect to an existing wastewater treatment facility. (Refer CWI 21-04-0008 Water and Sewer Plans for connection details).

EXISTING CONDITIONS MODELING DATA

The connection head condition was determined by modeling the existing wastewater system based on data provided by Griffey Engineering, Inc. to Connelly and Wicker on September 23rd, 2022, Construction Plans obtained from the SJRWMD and Lidar data for existing grades. Information obtained from those documents are the basis for the existing conditions modeling.

A summary of the peak flow requirements from each of the existing system pump stations and the anticipated flows modeled as part of these calculations is included.

DESIGN ANALYSIS

The modeling for this system was accomplished using Bentley OpenFlows WaterCad CONNECT Edition Update 3.

DESIGN OF SANITARY LIFT STATION

Connelly & Wicker, Inc.
Project Name: HILLSIDE GROVE
Project No: 21-04-0008
Date: October 7, 2022

COMPUTATION OF AVERAGE DAILY FLOW

Type of Development	Units	Average Flow (GPD)	/	Unit	G.P.D.	G.P.M.
Phase 1			/	Unit	0	0.00
Single Family Residential	245	300	/	Unit	73500	51.04
			/	Unit	0	0.00
Phase 2			/	Unit	0	0.00
Single Family Townhomes	146	300	/	Unit	43800	30.42
Phase 3 (Portion)			/	Unit	0	0.00
Single Family Residential	47	300	/	Unit	14100	9.79
Phase 4			/	Unit	0	0.00
Single Family Residential	202	300	/	Unit	60600	42.08
			/	Unit	0	0.00

Average Daily Flow = 192000 G.P.D. = 133.33 G.P.M.

Runout Peaking Factor = (Per CSM Section 17 Part 1.03.C) 3.00

Total Peak Flow = (A.D.F.)*(P.F.) = 400 G.P.M.

Use Total Peak Flow = Q = 400 G.P.M.

FORCE MAIN SIZE

Maximum Flow in Pipe = $Q(G.P.M.) * \left(\frac{1\ Cu.Ft.}{7.48\ Gal.}\right) * \left(\frac{1\ Min.}{60\ Sec.}\right)$ = 0.891 Cfs.

Pipe Diameter			Cross-Sectional Area		Flow (Cfs.)	Flow Velocity	
1. Use	4.27	Inch Pipe	0.099	Sq. Ft.	0.891	8.96	Ft/Sec.
2. Use	6.13	Inch Pipe	0.205	Sq. Ft.	0.891	4.35	Ft/Sec.
3. Use	8.04	Inch Pipe	0.353	Sq. Ft.	0.891	2.53	Ft/Sec.
4. Use	9.87	Inch Pipe	0.531	Sq. Ft.	0.891	1.68	Ft/Sec.
5. Use	11.73	Inch Pipe	0.750	Sq. Ft.	0.891	1.19	Ft/Sec.

Use Force Main of Diameter = 6.13 Inches

LIFT STATION FOR: HILLSIDE GROVE
PROJECT NO.: 21-04-0008

Connelly & Wicker, Inc.

DESIGN OF WET WELL

Use a cycle time (T) = 10 Minutes

Storage Required (Vr) = (T*Q) / 4 = 10 Min. * $\left(\frac{400 \text{ G.P.M.}}{4}\right)$ * $\left(\frac{1 \text{ Cu.Ft.}}{7.48 \text{ Gal.}}\right)$ = 133.69 Cu.Ft.

Storage Height Required for Each Size Wet Well

Diameter of Wet Well (Ft.)	4.00	5.00	6.00	8.00	10.00	12.00
Storage Height (Ft.)	10.64	6.81	4.73	2.66	1.70	1.18

Provide Wet Well Diameter = 8.00 Ft. Storage Height Required (Vr) = 2.66 Ft.

Provide Storage Height = 2.70 Ft. Actual Cycle Time = 10 Min.

Volume Provide (Vp) = 135.72 Cu.Ft.

Since Vr < Vp , Then, Adequate Storage is Provided

WET WELL INFORMATION

Refer To Construction Plans For Actual Pump Station Configuration

Wet Well Diameter = 8.00 Ft.
Wall Thickness (t) = 0.75 Ft.
Over Hang (L) = 1.00 Ft.

Top El. 88.40
Grade El. 87.90

Effluent El. (Force Main) 85.40

Control El. 69.60

Alarm El. 69.10

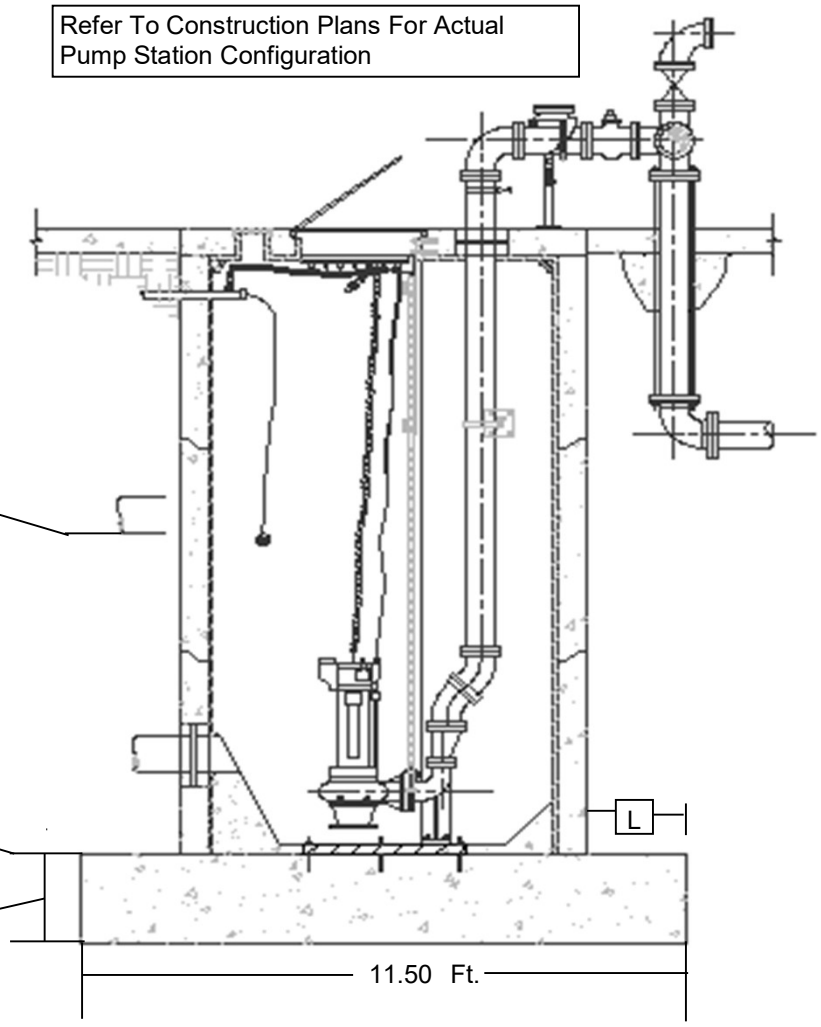
Lag Pump On El. 68.60

Lead Pump On El. 68.10

All Pumps Off El. 65.40

Bottom El. 63.40

Bottom Pad Thickness 1.00



LIFT STATION FOR: HILLSIDE GROVE
PROJECT NO.: 21-04-0008

Connelly & Wicker, Inc.

VERIFY THE STABILITY OF THE WET WELL

Assume:

Submerged Unit Weight of Soil	=	60	Lbs. Per Cu.Ft.
Unit Weight of Fiberglass	=	110	Lbs. Per Cu.Ft.
Unit Weight of Concrete	=	150	Lbs. Per Cu.Ft.
Angle of Repose ϕ =		5	Degrees

Wet Well:

Outer Diameter of Wet Well (D_{WW})	=	9.50	Ft.
Diameter of Base	=	11.50	Ft.
Thickness of Top Cover	=	0.83	Ft.
Thickness of Walls (t)	=	0.75	Ft.
Thickness of Bottom Pad	=	1.00	Ft.
Depth of Wetwell below Grade (H)	=	24.50	Ft.
Width of Collar	=	1.00	Ft.
Depth of Collar (if any)	=	0.00	Ft.
Hatch Size	=	36" X 60"	

Assume Saturated Conditions

Ground Water Elevation	=	87.90	

SELF WEIGHT OF WET WELL

Self Weight of Slabs (Lbs.) = (Volume) * (Unit Weight)

Weight of Soil Acting on Wet Well* (Lbs.) = (V_s)*(Unit Weight) Based on Angle of Repose (ϕ)

$$V_S = \left(\pi * (H) * \left((L)^2 + 2\left(\frac{D_{WW}}{2}\right)(L) + \left(\frac{D_{WW}}{2}\right)(H)(\mathrm{Tan}(\phi)) + (L)(H)(\mathrm{Tan}(\phi)) + \left(\frac{((H)(\mathrm{Tan}(\phi)))^2}{3}\right) \right) \right)$$

	Volume (CF)	*	Unit Weight (lb/CF)	=	Force	Lbs.
Top Cover :	46.38	*	150	=	6957.33	Lbs.
Bottom Pad :	103.87	*	150	=	15580.34	Lbs.
Collar	0.00	*	150	=	0.00	Lbs.
Walls :	498.31	*	150	=	74745.85	Lbs.
Soil :	1874.69	*	60	=	112481.56	Lbs.
			Total Downward Force:		209765.08	Lbs.

UPLIFT FORCE

Uplift Force = (Volume Displaced) * (Unit Weight of Water)

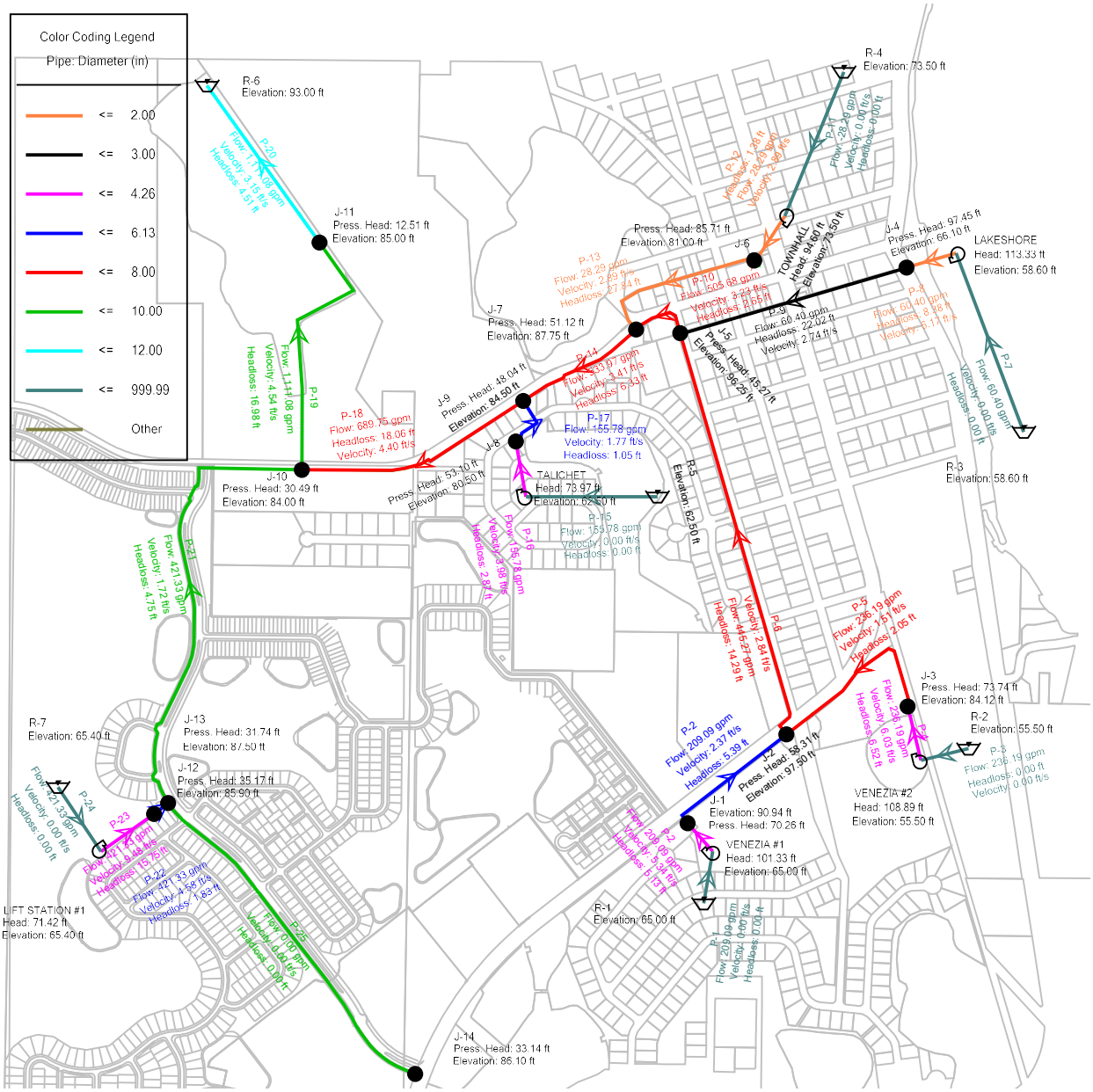
Uplift Force =	1840.48	*	62.4	=	114846.10	Lbs.

FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Downward Force}}{\text{Uplift Force}} = \frac{209765.08}{114846.10} = \mathbf{1.83}$$

Pump Information - Flygt					
Pump Type			2 Submersible Pumps		
Pump Model			NP 3153 HT 3~ 456		
Motor			N3153.660 21-15-4AA-W 15hp		
H.P. / Voltage / Phases / Amps			15 HP / 230V / 3 Phase / 32 A		
RPM			1755	R.P.M.	
Impeller Diameter			229	mm	
Discharge Pipe Size			4	Inches	
Force Main Size			4	Inches	
Design Point	400.00	GPM @	72.00	TDH	
Operating Point - Manifold Condition	421.33	GPM @	71.42	TDH	
Operating Point - Runout Condition	515.45	GPM @	65.78	TDH	

Scenario: Base (MANIFOLD CONDITIONS)



FlexTable: Junction Table (MANIFOLD CONDITIONS)

Label	Demand (gpm)	Elevation (ft)	Pressure (psi)	Pressure Head (ft)
J-1	0.00	90.94	30.4	70.26
J-2	0.00	97.50	25.2	58.31
J-3	0.00	84.12	31.9	73.74
J-4	0.00	66.10	42.2	97.45
J-5	0.00	96.25	19.6	45.27
J-6	0.00	81.00	37.1	85.71
J-7	0.00	87.75	22.1	51.12
J-8	0.00	80.50	23.0	53.10
J-9	0.00	84.50	20.8	48.04
J-10	0.00	84.00	13.2	30.49
J-11	0.00	85.00	5.4	12.51
J-12	0.00	85.90	15.2	35.17
J-13	0.00	87.50	13.7	31.74
J-14	0.00	86.10	14.3	33.14

FlexTable: Pipe Table (MANIFOLD CONDITIONS)

Label	Diameter (in)	Length (User Defined) (ft)	Length (ft)	Material	Hazen-Williams C	Minor Loss Coefficient (Unified)	Flow (gpm)	Velocity (ft/s)	Headloss (Friction) (ft)	Headloss (Minor) (ft)	Headloss (ft)
P-1	999.00	1	1	PVC	120.0	0.000	209.09	0.00	0.00	0.00	0.00
P-2	4.00	28	28	PVC	120.0	9.430	209.09	5.34	0.95	4.18	5.13
P-2	6.00	0	927	PVC	110.0	2.580	209.09	2.37	5.16	0.23	5.39
P-3	999.00	1	1	PVC	120.0	0.000	236.19	0.00	0.00	0.00	0.00
P-4	4.00	28	28	PVC	120.0	9.430	236.19	6.03	1.19	5.33	6.52
P-5	8.00	0	1,310	PVC	120.0	3.770	236.19	1.51	1.92	0.13	2.05
P-6	8.00	0	2,771	PVC	120.0	9.340	445.27	2.84	13.12	1.17	14.29
P-7	999.00	1	1	PVC	120.0	0.000	60.40	0.00	0.00	0.00	0.00
P-8	2.00	28	28	PVC	120.0	9.430	60.40	6.17	2.80	5.58	8.38
P-9	3.00	0	1,548	PVC	120.0	4.170	60.40	2.74	21.54	0.49	22.02
P-10	8.00	0	411	PVC	120.0	1.190	505.68	3.23	2.46	0.19	2.65
P-11	999.00	1	1	PVC	120.0	0.000	-28.29	0.00	0.00	0.00	0.00
P-12	2.00	18	18	PVC	120.0	7.270	28.29	2.89	0.44	0.94	1.38
P-13	2.00	0	1,132	HDPE	120.0	0.000	28.29	2.89	27.84	0.00	27.84
P-14	8.00	0	884	PVC	120.0	2.580	533.97	3.41	5.86	0.47	6.33
P-15	999.00	1	1	PVC	120.0	0.000	155.78	0.00	0.00	0.00	0.00
P-16	4.00	28	28	PVC	120.0	9.430	155.78	3.98	0.55	2.32	2.87
P-17	6.00	0	362	PVC	120.0	1.190	155.78	1.77	0.99	0.06	1.05
P-18	8.00	0	1,578	PVC	120.0	4.170	689.75	4.40	16.80	1.26	18.06
P-19	10.00	0	1,779	PVC	120.0	4.770	1,111.08	4.54	15.45	1.53	16.98
P-20	12.00	0	1,262	PVC	120.0	0.000	1,111.08	3.15	4.51	0.00	4.51
P-21	10.00	0	3,027	PVC	120.0	8.490	421.33	1.72	4.36	0.39	4.75
P-22	6.13	0	117	PVC	120.0	0.000	421.33	4.58	1.83	0.00	1.83
P-23	4.26	28	28	PVC	120.0	9.430	421.33	9.48	2.56	13.18	15.75
P-24	999.00	1	1	PVC	120.0	0.000	421.33	0.00	0.00	0.00	0.00
P-25	10.00	0	2,429	PVC	120.0	3.900	0.00	0.00	0.00	0.00	0.00

FlexTable: Pump Table (MANIFOLD CONDITIONS)

Label	Pump Definition	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
LAKESHORE	LAKESHORE	58.60	58.60	171.93	60.40	113.33
LIFT STATION #1	Flygt Pump	65.40	65.40	136.82	421.33	71.42
TALICHET	TALICHET	62.50	62.50	136.47	155.78	73.97
TOWNHALL	TOWNHALL	73.50	73.50	168.10	28.29	94.60
VENEZIA #1	VENEZIA #1	65.00	65.00	166.33	209.09	101.33
VENEZIA #2	VENEZIA #2	55.50	55.50	164.39	236.19	108.89

Pump Definition Detailed Report: LAKESHORE (MANIFOLD CONDITIONS)

Element Details			
ID	173	Notes	
Label	LAKESHORE		

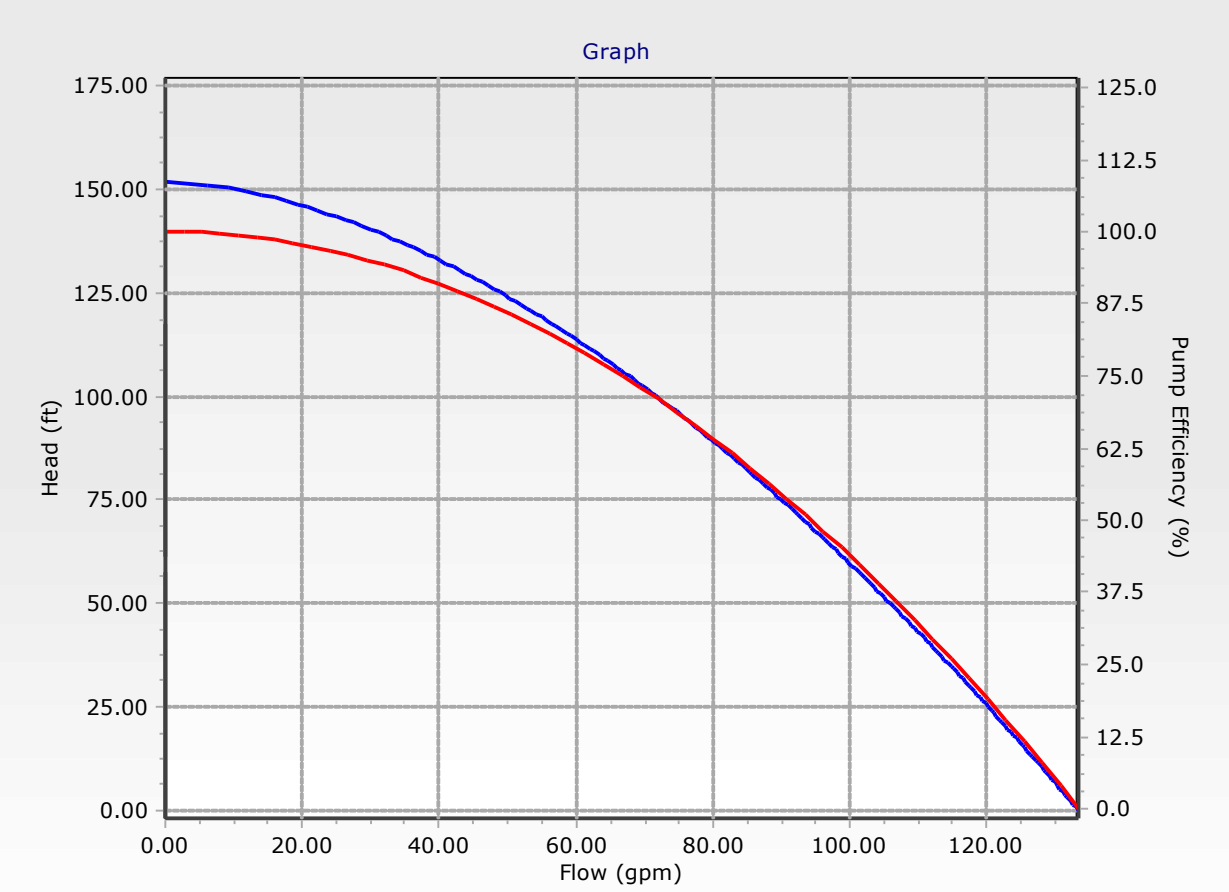
Pump Curve

Flow (gpm)	Head (ft)
0.00	157.00
3.00	155.00
9.00	150.00
17.00	145.00
24.00	140.00
32.00	135.00
39.00	130.00
47.00	125.00
53.00	120.00
61.00	115.00
65.00	110.00
69.00	105.00
73.00	100.00
77.00	95.00
81.00	90.00
84.00	85.00
87.50	80.00
90.00	75.00
93.00	70.00
97.00	65.00
99.00	60.00
102.50	55.00
105.00	50.00
108.00	45.00

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: LAKESHORE (MANIFOLD CONDITIONS)



Pump Definition Detailed Report: TALICHET (MANIFOLD CONDITIONS)

Element Details			
ID	183	Notes	
Label	TALICHET		

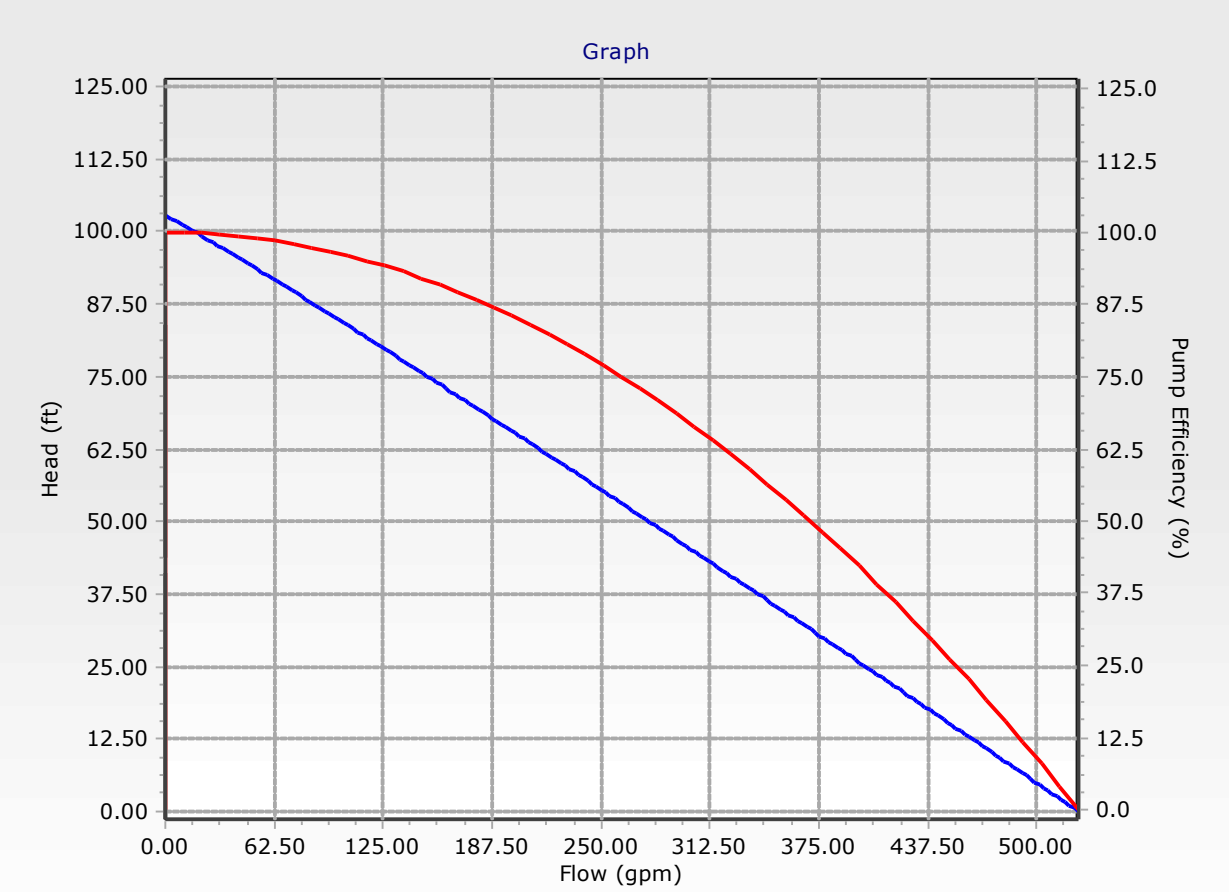
Pump Curve

Flow (gpm)	Head (ft)
0.04	104.92
18.66	100.40
37.27	96.18
55.88	92.18
74.50	88.34
93.11	84.65
111.73	81.08
130.34	77.63
148.95	74.27
167.57	70.98
186.18	67.73
204.79	64.49
223.41	61.22
242.02	57.88
260.63	54.44
279.25	50.89
297.86	47.22
316.47	43.43
335.09	39.54
353.00	35.56
372.31	31.51
390.93	27.40
409.54	23.22
428.15	18.97
446.77	14.65
480.45	6.91

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: TALICHET (MANIFOLD CONDITIONS)



Pump Definition Detailed Report: TOWNHALL (MANIFOLD CONDITIONS)

Element Details			
ID	178	Notes	
Label	TOWNHALL		

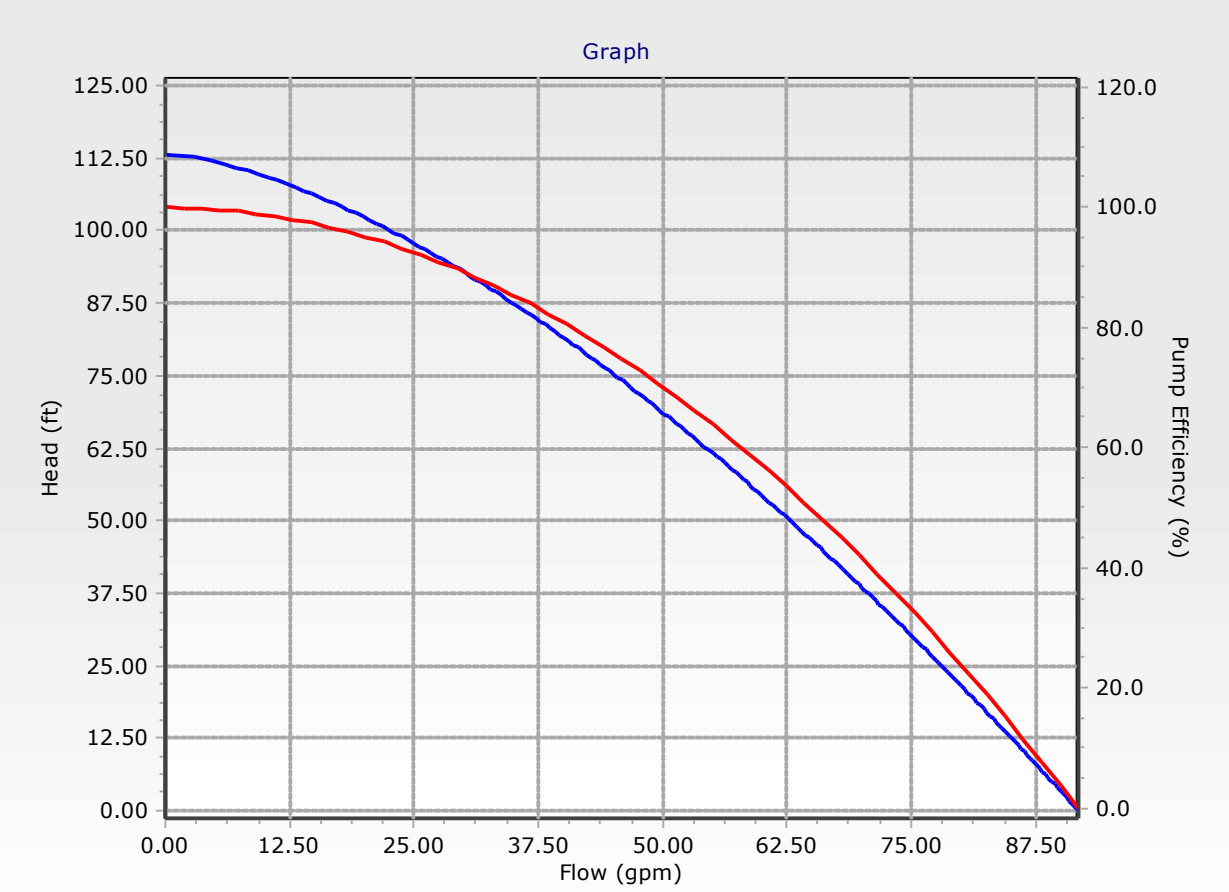
Pump Curve

Flow (gpm)	Head (ft)
0.00	114.20
5.60	111.00
11.40	108.00
15.90	105.00
20.00	102.00
23.80	99.00
27.10	96.00
30.10	93.00
33.00	90.00
35.60	87.00
38.10	84.00
40.50	81.00
42.90	78.00
45.00	75.00
47.70	72.00
49.50	69.00
51.80	66.00

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: TOWNHALL (MANIFOLD CONDITIONS)



Pump Definition Detailed Report: VENEZIA #1 (MANIFOLD CONDITIONS)

Element Details

ID	59	Notes	
Label	VENEZIA #1		

Pump Definition Type

Pump Definition Type	Design Point (1 Point)	Design Head	87.00 ft
Shutoff Flow	0.00 gpm	Maximum Operating Flow	0.00 gpm
Shutoff Head	0.00 ft	Maximum Operating Head	0.00 ft
Design Flow	294.00 gpm		

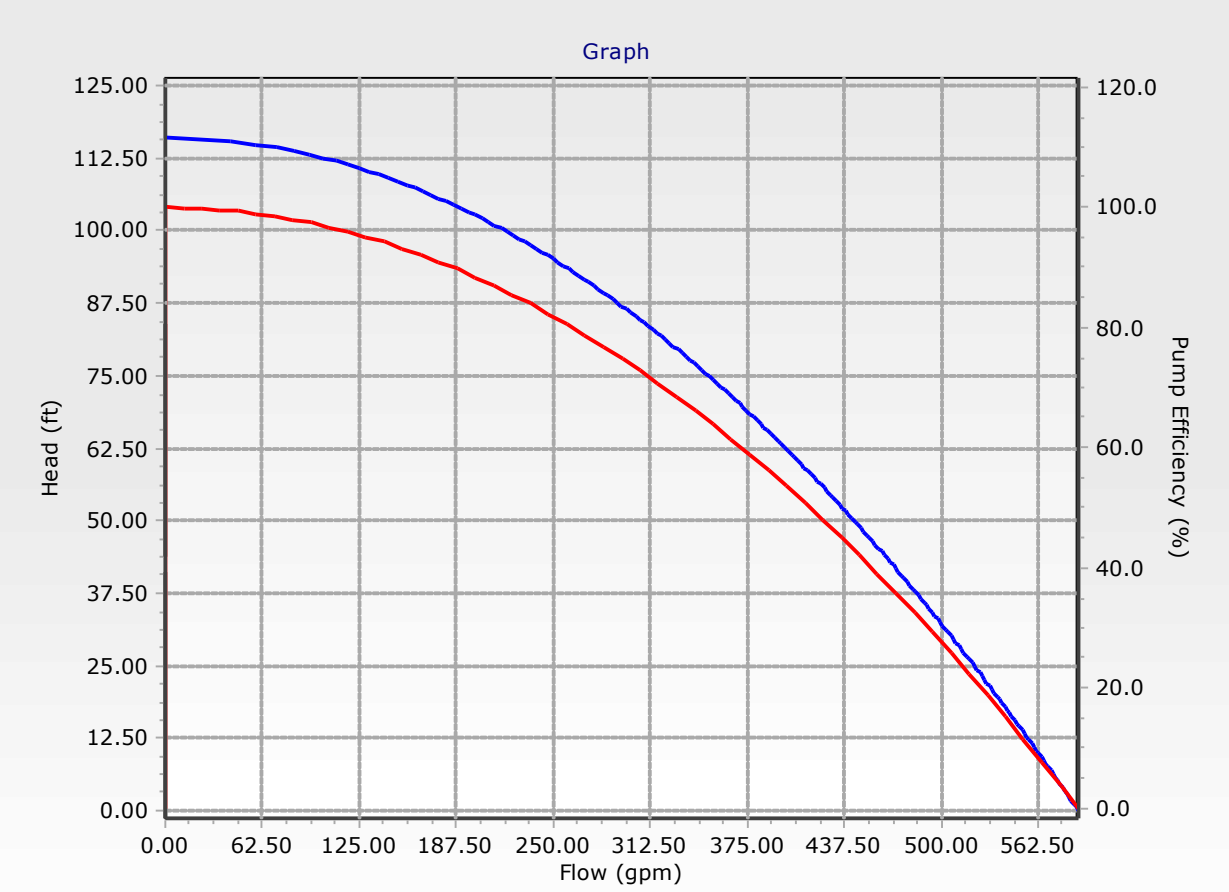
Pump Efficiency Type

Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)

Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: VENEZIA #1 (MANIFOLD CONDITIONS)



Pump Definition Detailed Report: VENEZIA #2 (MANIFOLD CONDITIONS)

Element Details

ID	163	Notes	
Label	VENEZIA #2		

Pump Definition Type

Pump Definition Type	Design Point (1 Point)	Design Head	94.00 ft
Shutoff Flow	0.00 gpm	Maximum Operating Flow	0.00 gpm
Shutoff Head	0.00 ft	Maximum Operating Head	0.00 ft
Design Flow	326.00 gpm		

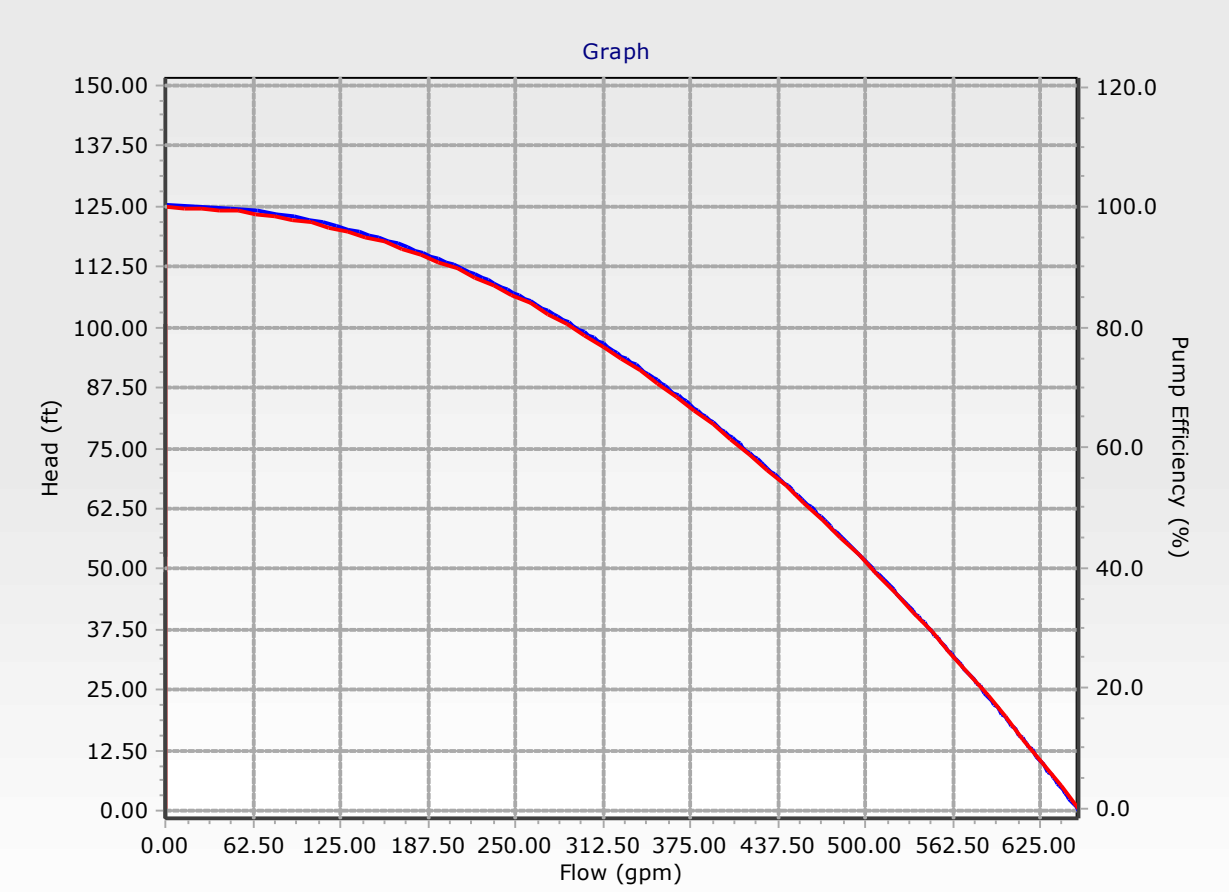
Pump Efficiency Type

Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)

Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: VENEZIA #2 (MANIFOLD CONDITIONS)



Pump Definition Detailed Report: Flygt Pump (MANIFOLD CONDITIONS)

Element Details			
ID	86	Notes	
Label	Flygt Pump		

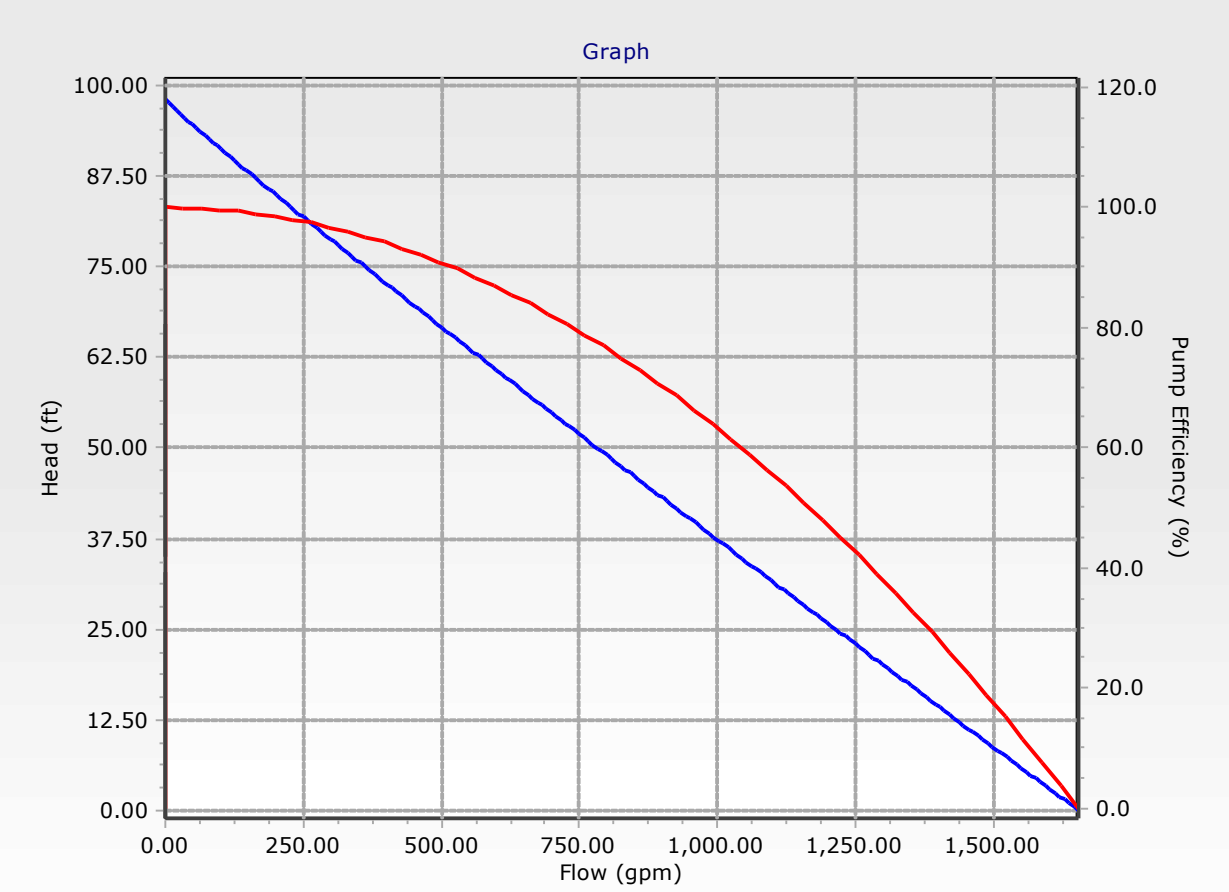
Pump Curve

Flow (gpm)	Head (ft)
0.10	98.68
48.71	95.04
97.33	91.49
145.95	88.07
194.57	84.78
243.19	81.63
291.80	78.62
340.42	75.72
389.04	72.91
437.66	70.16
486.28	67.45
534.90	64.75
583.51	62.05
632.13	59.34
680.75	56.59
729.37	53.81
777.99	50.99
826.61	48.12
875.22	45.19
923.84	42.17
972.46	39.08
1,021.08	35.89
1,069.70	32.64
1,132.07	28.43

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Flygt Pump (MANIFOLD CONDITIONS)



FlexTable: Reservoir Table (MANIFOLD CONDITIONS)

Label	Elevation (ft)	Flow (Out net) (gpm)
R-1	65.00	209.09
R-2	55.50	236.19
R-3	58.60	60.40
R-4	73.50	28.29
R-5	62.50	155.78
R-6	93.00	-1,111.08
R-7	65.40	421.33

System Head Curve Detailed Report - System Head Curve - 1 (MANIFOLD CONDITIONS)

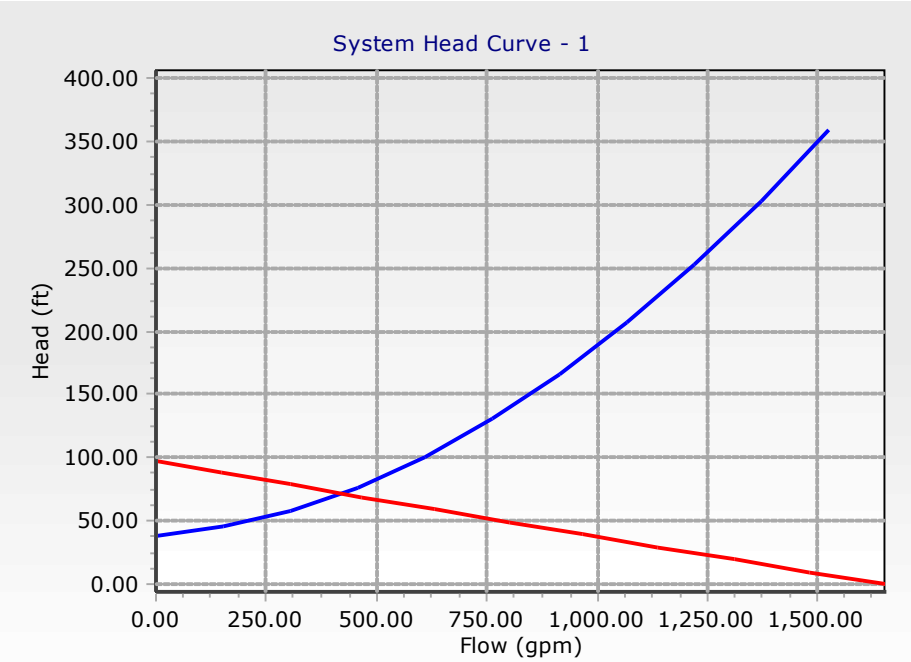
Element Details

Label	System Head Curve - 1	Number of Intervals	10
Pump	LIFT STATION #1	Specify vertical axis limits	False
Maximum Flow	1,523.97 gpm		

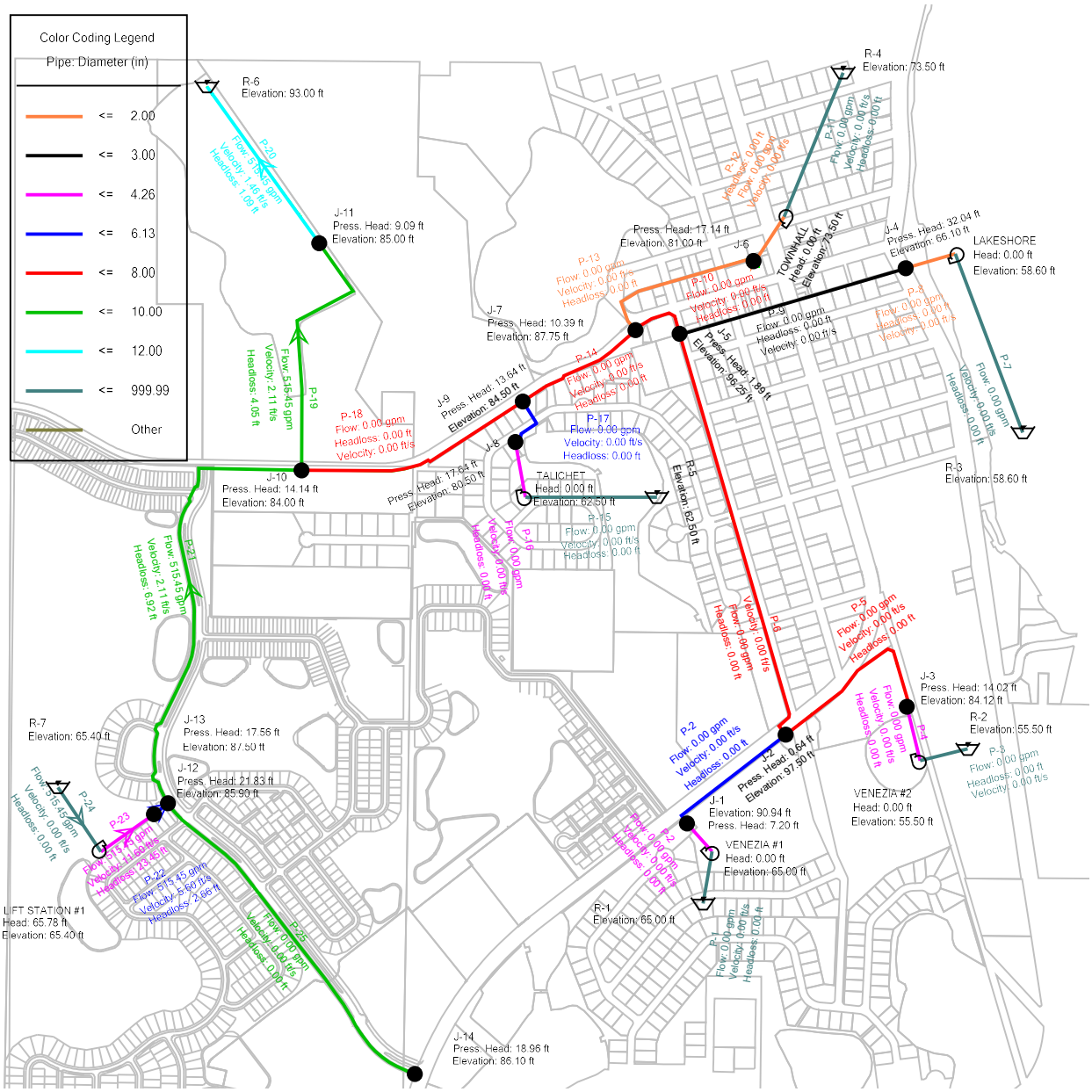
Time (hours)
0.000

System Head Curve @ 0.000 hours Flow (gpm)	System Head Curve @ 0.000 hours Head (ft)	Flygt Pump Flow (gpm)	Flygt Pump Head (ft)
0.00	38.24	1,654.66	0.00
152.40	44.89	1,481.54	9.80
304.79	57.70	1,309.36	19.60
457.19	76.31	1,138.23	29.41
609.59	100.58	968.29	39.21
761.99	130.38	799.75	49.01
914.38	165.63	632.85	58.81
1,066.78	206.24	468.00	68.62
1,219.18	252.13	305.88	78.42
1,371.57	303.23	147.84	88.22
1,523.97	359.46	0.00	98.02

System Head Curve Detailed Report - System Head Curve - 1 (MANIFOLD CONDITIONS)



Scenario: Base (RUNOUT CONDITIONS)



FlexTable: Junction Table (RUNOUT CONDITIONS)

Label	Demand (gpm)	Elevation (ft)	Pressure (psi)	Pressure Head (ft)
J-1	0.00	90.94	3.1	7.20
J-2	0.00	97.50	0.3	0.64
J-3	0.00	84.12	6.1	14.02
J-4	0.00	66.10	13.9	32.04
J-5	0.00	96.25	0.8	1.89
J-6	0.00	81.00	7.4	17.14
J-7	0.00	87.75	4.5	10.39
J-8	0.00	80.50	7.6	17.64
J-9	0.00	84.50	5.9	13.64
J-10	0.00	84.00	6.1	14.14
J-11	0.00	85.00	3.9	9.09
J-12	0.00	85.90	9.4	21.83
J-13	0.00	87.50	7.6	17.56
J-14	0.00	86.10	8.2	18.96

FlexTable: Pipe Table (RUNOUT CONDITIONS)

Label	Diameter (in)	Length (User Defined) (ft)	Length (ft)	Material	Hazen-Williams C	Minor Loss Coefficient (Unified)	Flow (gpm)	Velocity (ft/s)	Headloss (Friction) (ft)	Headloss (Minor) (ft)	Headloss (ft)
P-1	999.00	1	1	PVC	120.0	0.000	0.00	0.00	0.00	0.00	0.00
P-2	4.00	28	28	PVC	120.0	9.430	0.00	0.00	0.00	0.00	0.00
P-2	6.00	0	927	PVC	110.0	2.580	0.00	0.00	0.00	0.00	0.00
P-3	999.00	1	1	PVC	120.0	0.000	0.00	0.00	0.00	0.00	0.00
P-4	4.00	28	28	PVC	120.0	9.430	0.00	0.00	0.00	0.00	0.00
P-5	8.00	0	1,310	PVC	120.0	3.770	0.00	0.00	0.00	0.00	0.00
P-6	8.00	0	2,771	PVC	120.0	9.340	0.00	0.00	0.00	0.00	0.00
P-7	999.00	1	1	PVC	120.0	0.000	0.00	0.00	0.00	0.00	0.00
P-8	2.00	28	28	PVC	120.0	9.430	0.00	0.00	0.00	0.00	0.00
P-9	3.00	0	1,548	PVC	120.0	4.170	0.00	0.00	0.00	0.00	0.00
P-10	8.00	0	411	PVC	120.0	1.190	0.00	0.00	0.00	0.00	0.00
P-11	999.00	1	1	PVC	120.0	0.000	0.00	0.00	0.00	0.00	0.00
P-12	2.00	18	18	PVC	120.0	7.270	0.00	0.00	0.00	0.00	0.00
P-13	2.00	0	1,132	HDPE	120.0	0.000	0.00	0.00	0.00	0.00	0.00
P-14	8.00	0	884	PVC	120.0	2.580	0.00	0.00	0.00	0.00	0.00
P-15	999.00	1	1	PVC	120.0	0.000	0.00	0.00	0.00	0.00	0.00
P-16	4.00	28	28	PVC	120.0	9.430	0.00	0.00	0.00	0.00	0.00
P-17	6.00	0	362	PVC	120.0	1.190	0.00	0.00	0.00	0.00	0.00
P-18	8.00	0	1,578	PVC	120.0	4.170	0.00	0.00	0.00	0.00	0.00
P-19	10.00	0	1,779	PVC	120.0	4.770	515.45	2.11	3.73	0.33	4.05
P-20	12.00	0	1,262	PVC	120.0	0.000	515.45	1.46	1.09	0.00	1.09
P-21	10.00	0	3,027	PVC	120.0	8.490	515.45	2.11	6.34	0.58	6.92
P-22	6.13	0	117	PVC	120.0	0.000	515.45	5.60	2.66	0.00	2.66
P-23	4.26	28	28	PVC	120.0	9.430	515.45	11.60	3.72	19.73	23.45
P-24	999.00	1	1	PVC	120.0	0.000	515.45	0.00	0.00	0.00	0.00
P-25	10.00	0	2,429	PVC	120.0	3.900	0.00	0.00	0.00	0.00	0.00

Pump Definition Detailed Report: Flygt Pump (RUNOUT CONDITIONS)

Element Details			
ID	86	Notes	
Label	Flygt Pump		

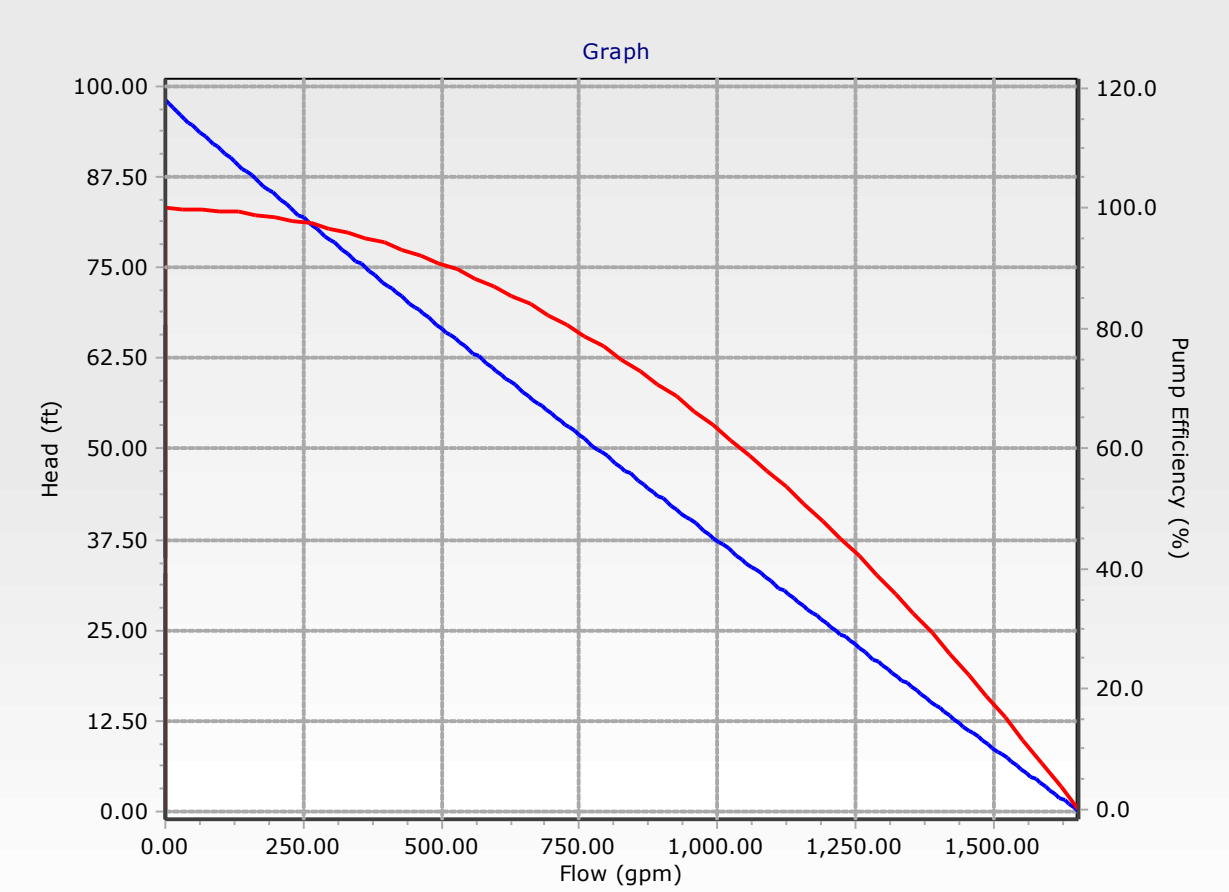
Pump Curve

Flow (gpm)	Head (ft)
0.10	98.68
48.71	95.04
97.33	91.49
145.95	88.07
194.57	84.78
243.19	81.63
291.80	78.62
340.42	75.72
389.04	72.91
437.66	70.16
486.28	67.45
534.90	64.75
583.51	62.05
632.13	59.34
680.75	56.59
729.37	53.81
777.99	50.99
826.61	48.12
875.22	45.19
923.84	42.17
972.46	39.08
1,021.08	35.89
1,069.70	32.64
1,132.07	28.43

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0.00 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Flygt Pump (RUNOUT CONDITIONS)



FlexTable: Pump Table (RUNOUT CONDITIONS)

Label	Pump Definition	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
LAKESHORE	LAKESHORE	58.60	58.60	98.14	0.00	0.00
LIFT STATION #1	Flygt Pump	65.40	65.40	131.18	515.45	65.78
TALICHET	TALICHET	62.50	62.50	98.14	0.00	0.00
TOWNHALL	TOWNHALL	73.50	73.50	98.14	0.00	0.00
VENEZIA #1	VENEZIA #1	65.00	65.00	98.14	0.00	0.00
VENEZIA #2	VENEZIA #2	55.50	55.50	98.14	0.00	0.00

FlexTable: Reservoir Table (RUNOUT CONDITIONS)

Label	Elevation (ft)	Flow (Out net) (gpm)
R-1	65.00	0.00
R-2	55.50	0.00
R-3	58.60	0.00
R-4	73.50	0.00
R-5	62.50	0.00
R-6	93.00	-515.45
R-7	65.40	515.45

System Head Curve Detailed Report - System Head Curve - 1 (RUNOUT CONDITIONS)

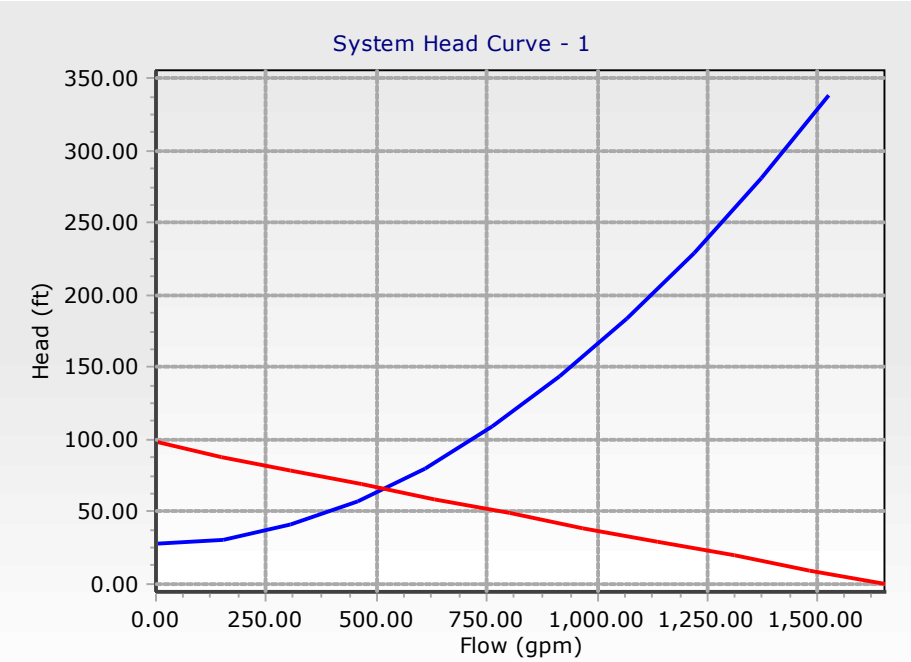
Element Details

Label	System Head Curve - 1	Number of Intervals	10
Pump	LIFT STATION #1	Specify vertical axis limits	False
Maximum Flow	1,523.97 gpm		

Time (hours)
0.000

System Head Curve @ 0.000 hours Flow (gpm)	System Head Curve @ 0.000 hours Head (ft)	Flygt Pump Flow (gpm)	Flygt Pump Head (ft)
0.00	27.60	1,654.66	0.00
152.40	31.24	1,481.54	9.80
304.79	41.45	1,309.36	19.60
457.19	57.89	1,138.23	29.41
609.59	80.40	968.29	39.21
761.99	108.88	799.75	49.01
914.38	143.26	632.85	58.81
1,066.78	183.47	468.00	68.62
1,219.18	229.46	305.88	78.42
1,371.57	281.18	147.84	88.22
1,523.97	338.61	0.00	98.02

System Head Curve Detailed Report - System Head Curve - 1 (RUNOUT CONDITIONS)



SUMMARY OF REQUIRED VS MODELED FLOWS

Connelly & Wicker, Inc.
Project Name: HILLSIDE GROVE
Project No: 21-04-0008
Date: October 6, 2022

COMPUTATION OF EXISTING SYSTEM FLOWS

Talichet Pump Station	Quantity	ADF	Unit	ADF (GPD)	ADF (GPM)	Peaking Factor	Peak Flow (GPM)
Single Family Residential	93	300	/ Unit	27900	19.4	3.72	72.1
* Data taken from Construction Plans for Venezia North Subdivision obtained from the SJRWMD							

SUMMARY OF EXISTING PUMP STATION REQUIRED VS MODELED FLOWS

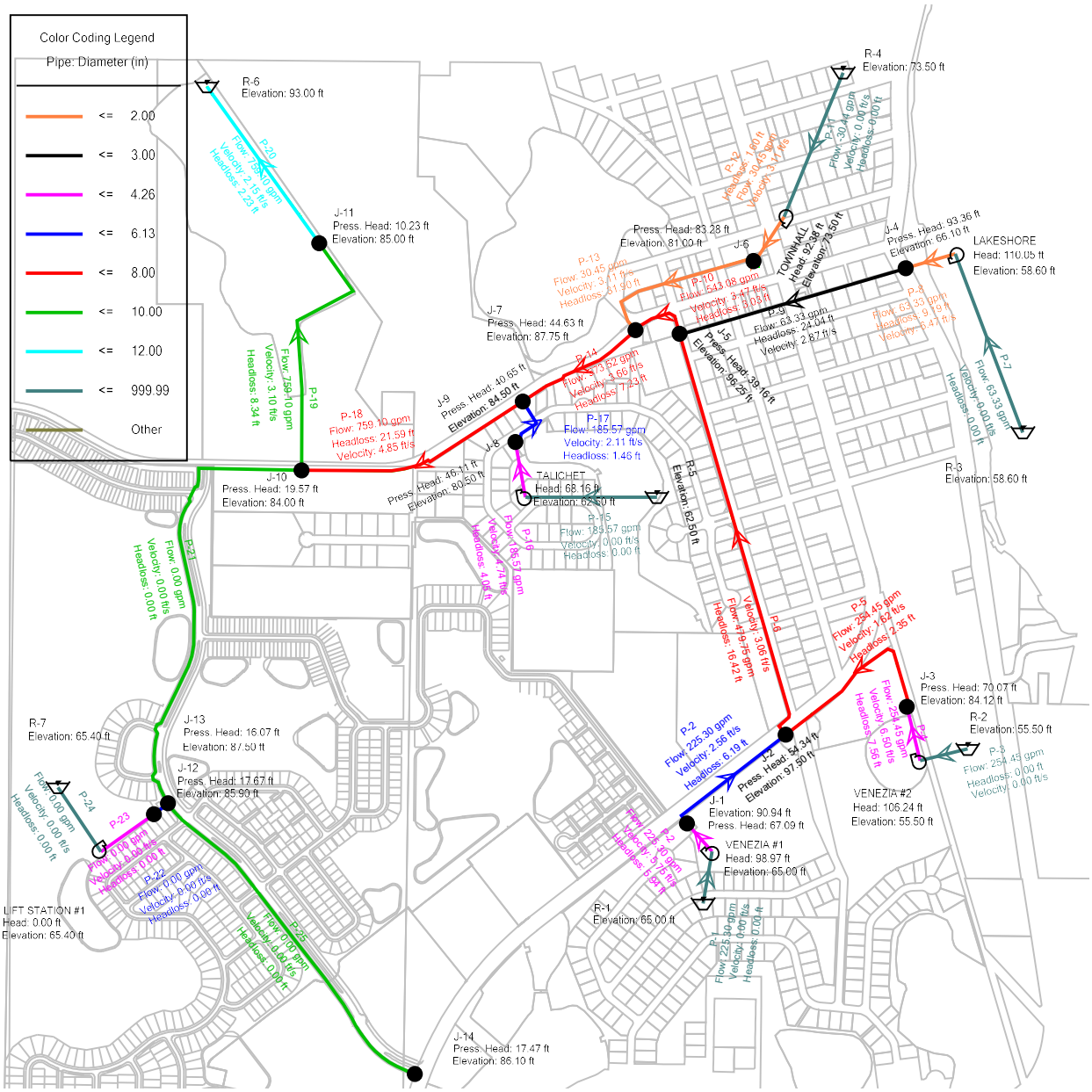
Pump Station Name	Required Peak Flow (GPM)	Peak Flow at Manifold Condition per Watercad Modeling (GPM)
Venezia Pump Station #1	133	209
* Data taken from Howey-In-The-Hills Wastewater Master Plan dated October 2018		
Venezia Pump Station #2	204	236
* Data taken from Howey-In-The-Hills Wastewater Master Plan dated October 2018		
Talichet Pump Station	72	156
* Data calculated above		
Lakeshore Pump Station	59	60
* Data taken Pump Station Engineering Plan provided by Griffey Engineering, Inc.		
Townhall Pump Station	26	28
* Data taken Pump Station Engineering Plan provided by Griffey Engineering, Inc.		

HILLSIDE GROVE PUMP STATION REQUIRED VS PROVIDED FLOWS

Pump Station Name	Required Peak Flow (GPM)	Flow at Manifold Condition per Watercad Modeling (GPM)	Flow at Runout Condition per Watercad Modeling (GPM)
Pump Station #1	400	421	515

APPENDIX

Scenario: Base (EXISTING NETWORK CONDITIONS)



FlexTable: Pump Table (EXISTING NETWORK CONDITIONS)

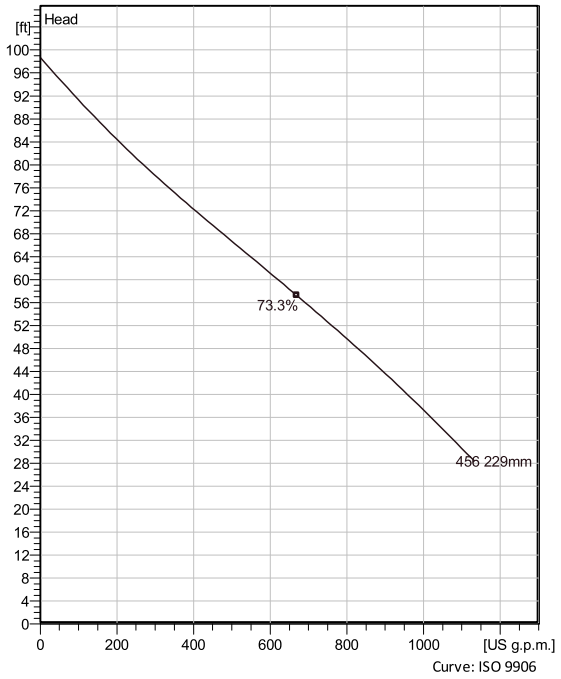
Label	Pump Definition	Elevation (ft)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
LAKESHORE	LAKESHORE	58.60	58.60	168.65	63.33	110.05
LIFT STATION #1	Flygt Pump	65.40	65.40	103.57	0.00	0.00
TALICHET	TALICHET	62.50	62.50	130.66	185.57	68.16
TOWNHALL	TOWNHALL	73.50	73.50	165.88	30.45	92.38
VENEZIA #1	VENEZIA #1	65.00	65.00	163.97	225.30	98.97
VENEZIA #2	VENEZIA #2	55.50	55.50	161.74	254.45	106.24

NP 3153 HT 3~ 456

Patented self cleaning semi-open channel impeller, ideal for pumping in waste water applications. Modular based design with high adaptation grade.

Technical specification

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.43 lb/ft³,1.6888E-5 ft²/s



Curve: ISO 9906

Configuration

Motor number
N3153.660 21-15-4AA-W 15hp

Installation type
P - Semi permanent, Wet

Impeller diameter
229 mm

Discharge diameter
4 inch

Pump information

Impeller diameter
229 mm

Discharge diameter
4 inch

Inlet diameter
150 mm

Maximum operating speed
1755 rpm

Number of blades
2

Max. fluid temperature
40 °C

Materials

Impeller
Stainless steel

Project		**Created by**	Garrett Queener		
Block	0	**Created on**	10/7/2022	**Last update**	10/7/2022

NP 3153 HT 3~ 456

Technical specification

Motor - General

Motor number N3153.660 21-15-4AA-W 15hp	**Phases** 3~	**Rated speed** 1755 rpm	**Rated power** 15 hp
ATEX approved No	**Number of poles** 4	**Rated current** 39 A	**Stator variant** 5
Frequency 60 Hz	**Rated voltage** 230 V	**Insulation class** H	**Type of Duty** S1
Version code 660			

Motor - Technical

Power factor - 1/1 Load 0.82	**Motor efficiency - 1/1 Load** 87.8 %	**Total moment of inertia** 1.76 lb ft²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.77	**Motor efficiency - 3/4 Load** 88.7 %	**Starting current, direct starting** 228 A	
Power factor - 1/2 Load 0.65	**Motor efficiency - 1/2 Load** 88.3 %	**Starting current, star-delta** 76 A	

Project		**Created by**	Garrett Queener		
Block	0	**Created on**	10/7/2022	**Last update**	10/7/2022

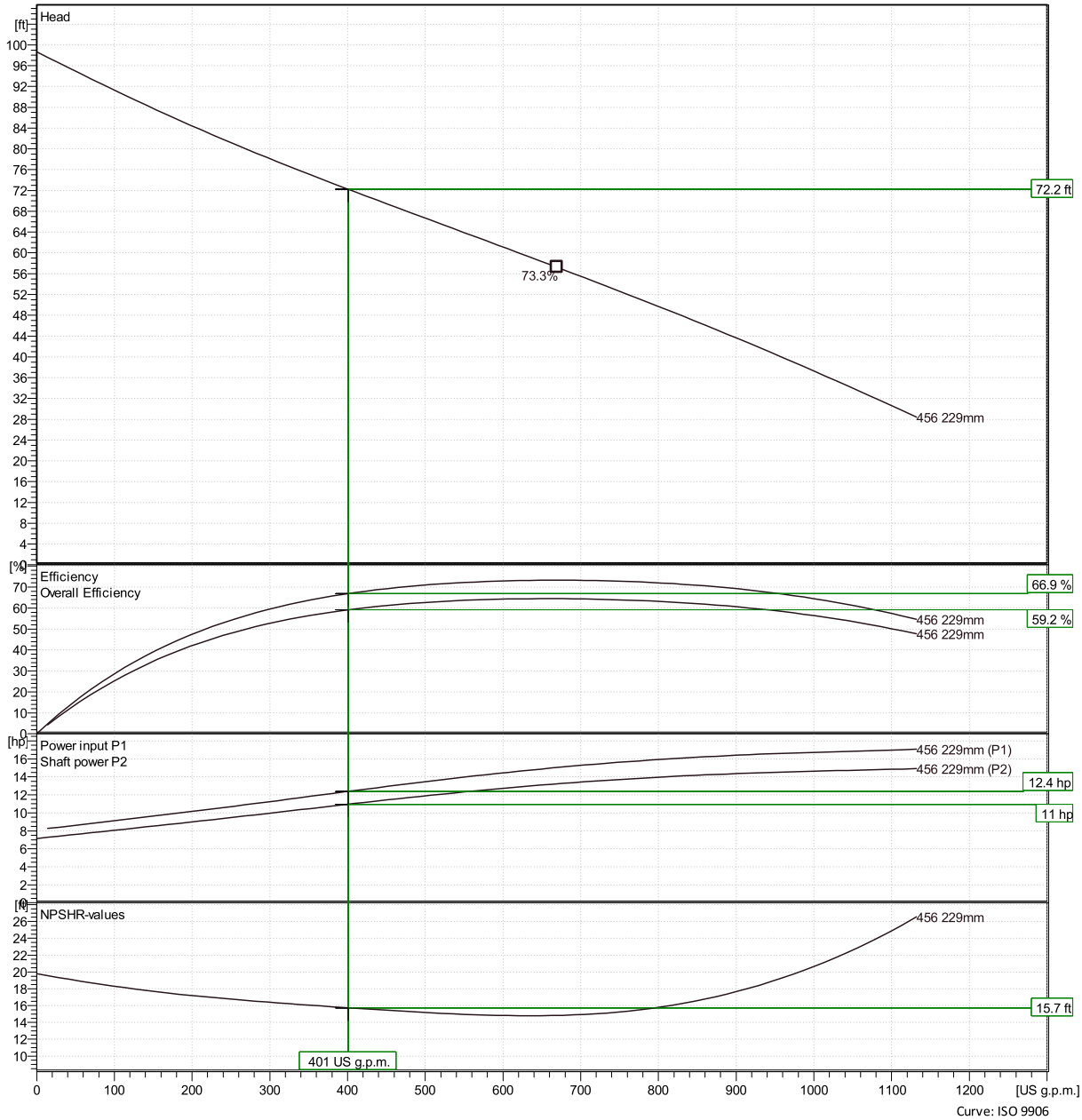
NP 3153 HT 3~ 456

Performance curve

Duty point

Flow	Head
401 US g.p.m.	72.2 ft

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.43 lb/ft³,1.6888E-5 ft²/s



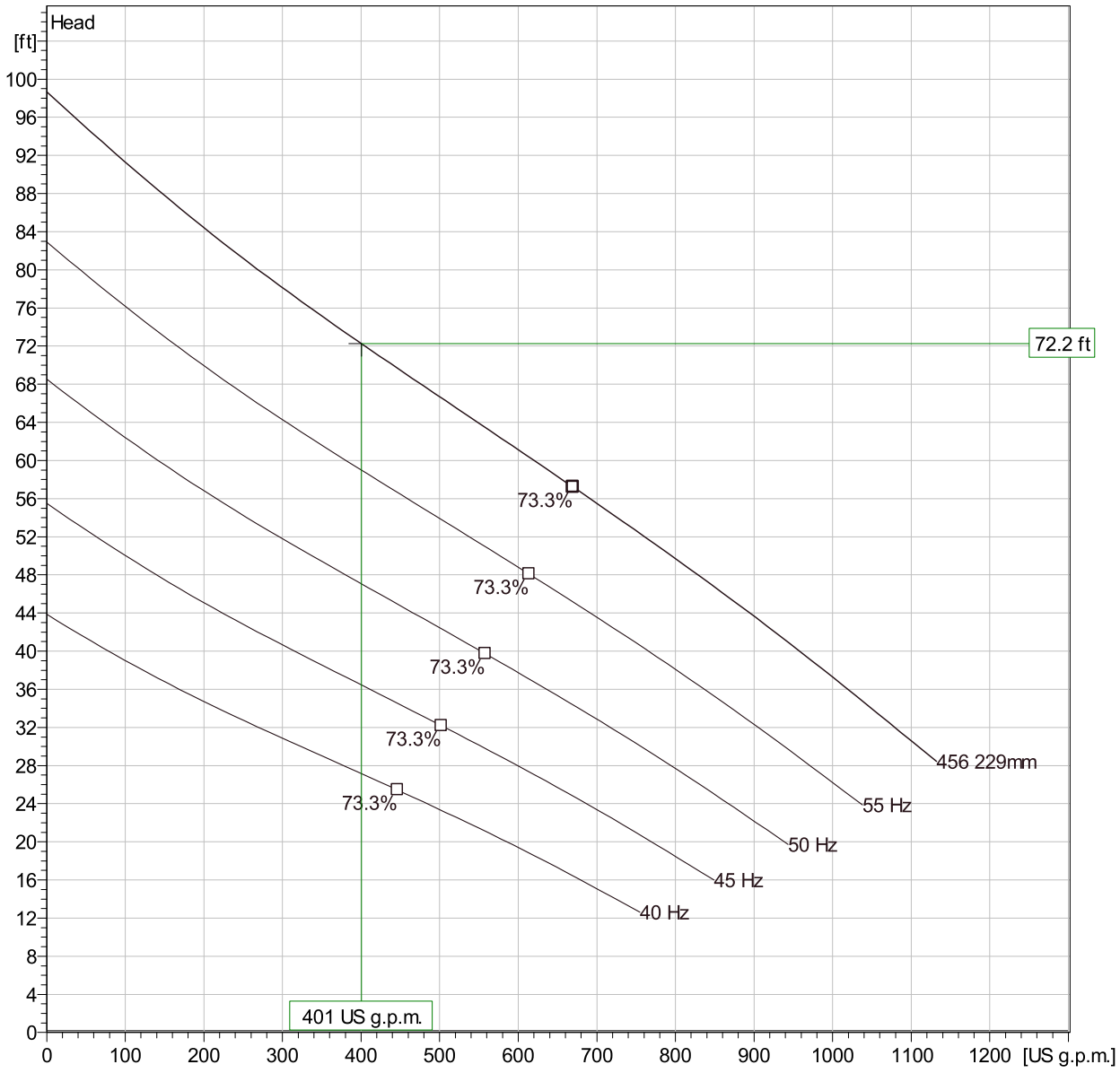
Curve: ISO 9906

			Garrett Queener		
0		**Created on**	10/7/2022	**Last update**	10/7/2022

NP 3153 HT 3~ 456

Duty Analysis

Curves according to: Water, pure [100%] ; 39.2°F; 62.43lb/ft³; 1.6888E-5ft²/s



Operating characteristics

Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Spec. Energy	NPSHre
	US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	401	72.2	11	401	72.2	11	66.9 %	384	15.7

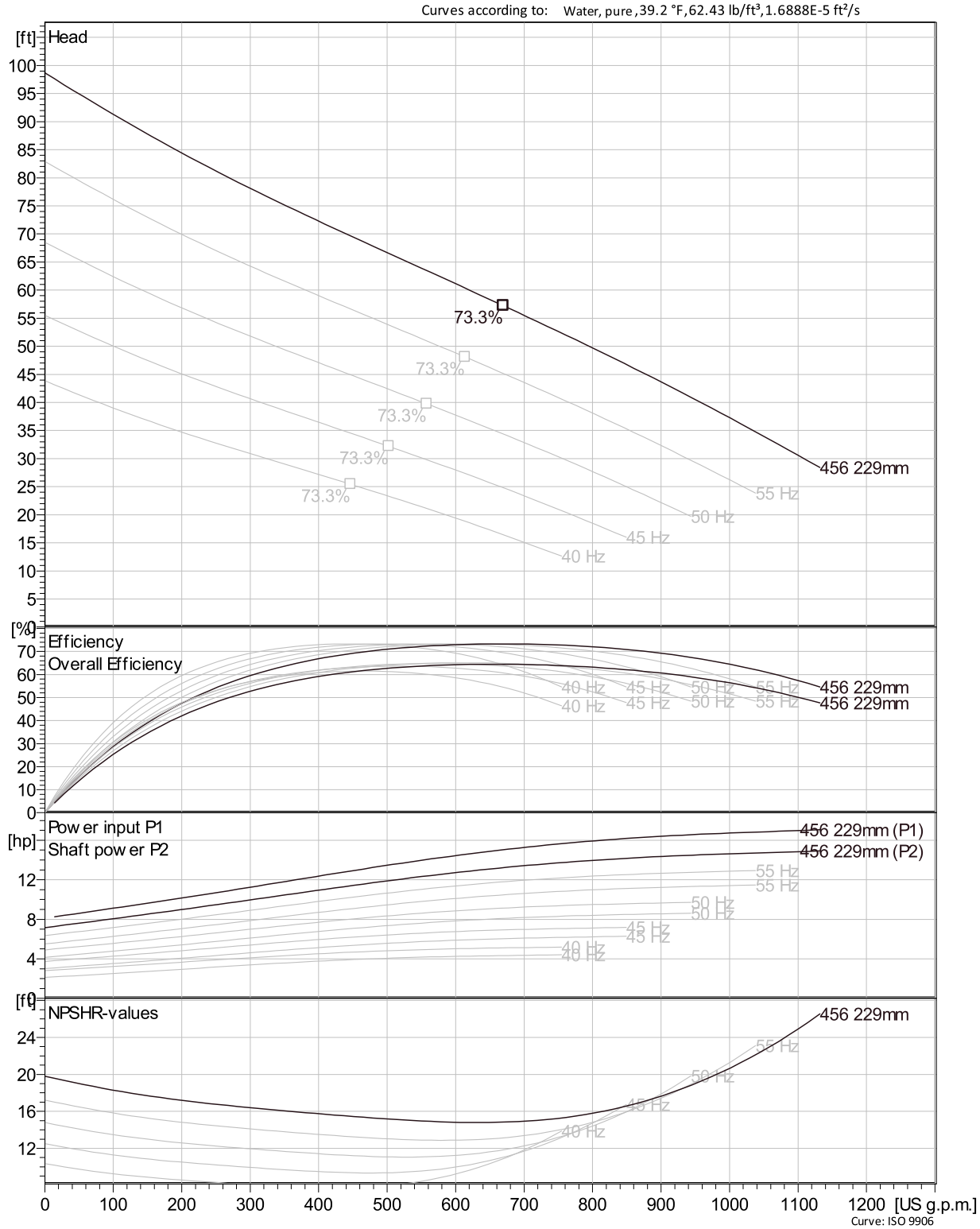
Project		**Created by**	Garrett Queener		
Block		**Created on**	10/7/2022	**Last update**	10/7/2022

NP 3153 HT 3~ 456

VFD Curve

FLYGT
a xylem brand

Curves according to: Water, pure ,39.2 °F,62.43 lb/ft³,1.6888E-5 ft²/s



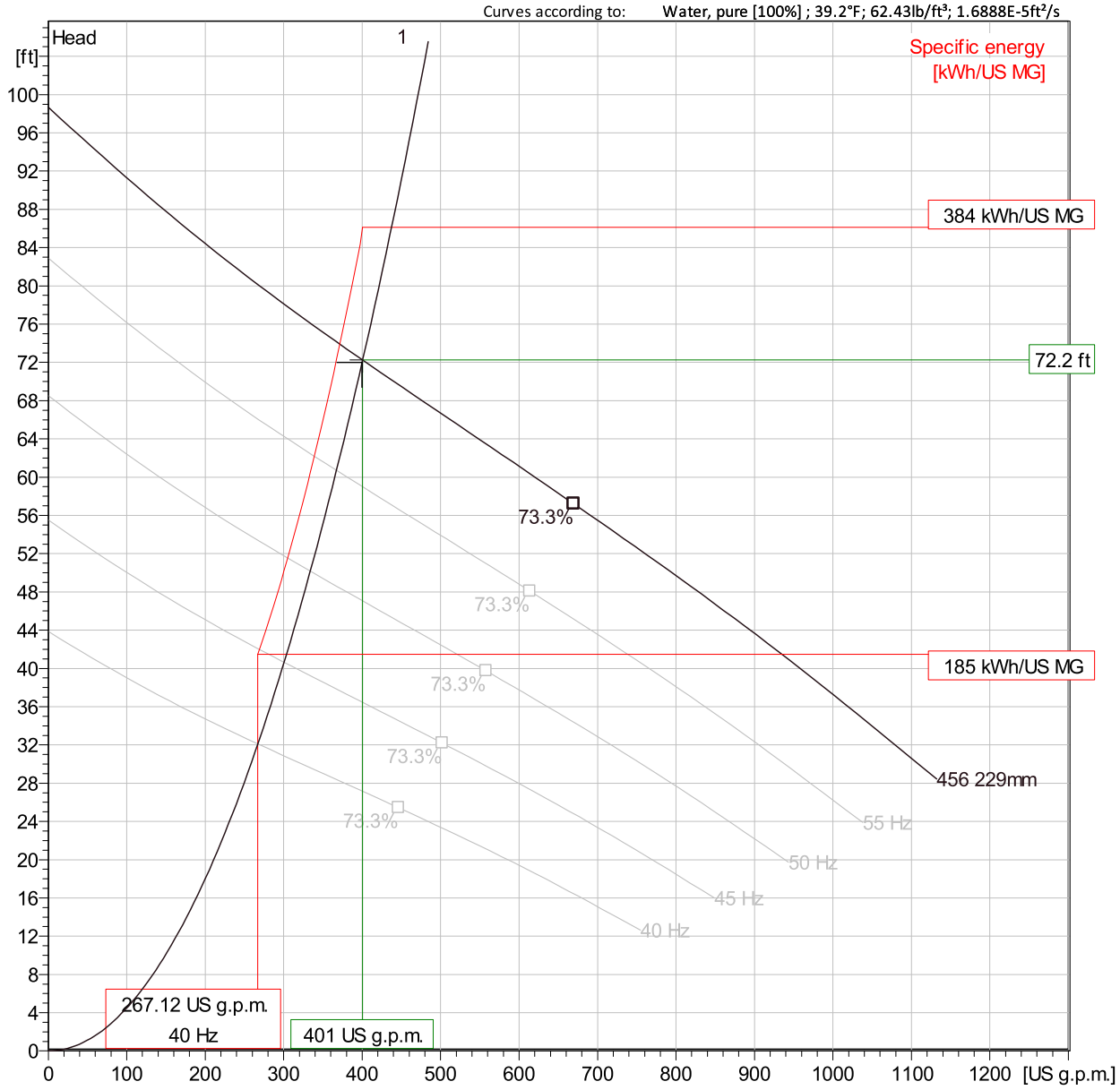
Curve: ISO 9906

Project		**Created by**	Garrett Queener		
Block	0	**Created on**	10/7/2022	**Last update**	10/7/2022

NP 3153 HT 3~ 456

VFD Analysis

Curves according to: Water, pure [100%] ; 39.2°F; 62.43lb/ft³; 1.6888E-5ft²/s



Operating Characteristics

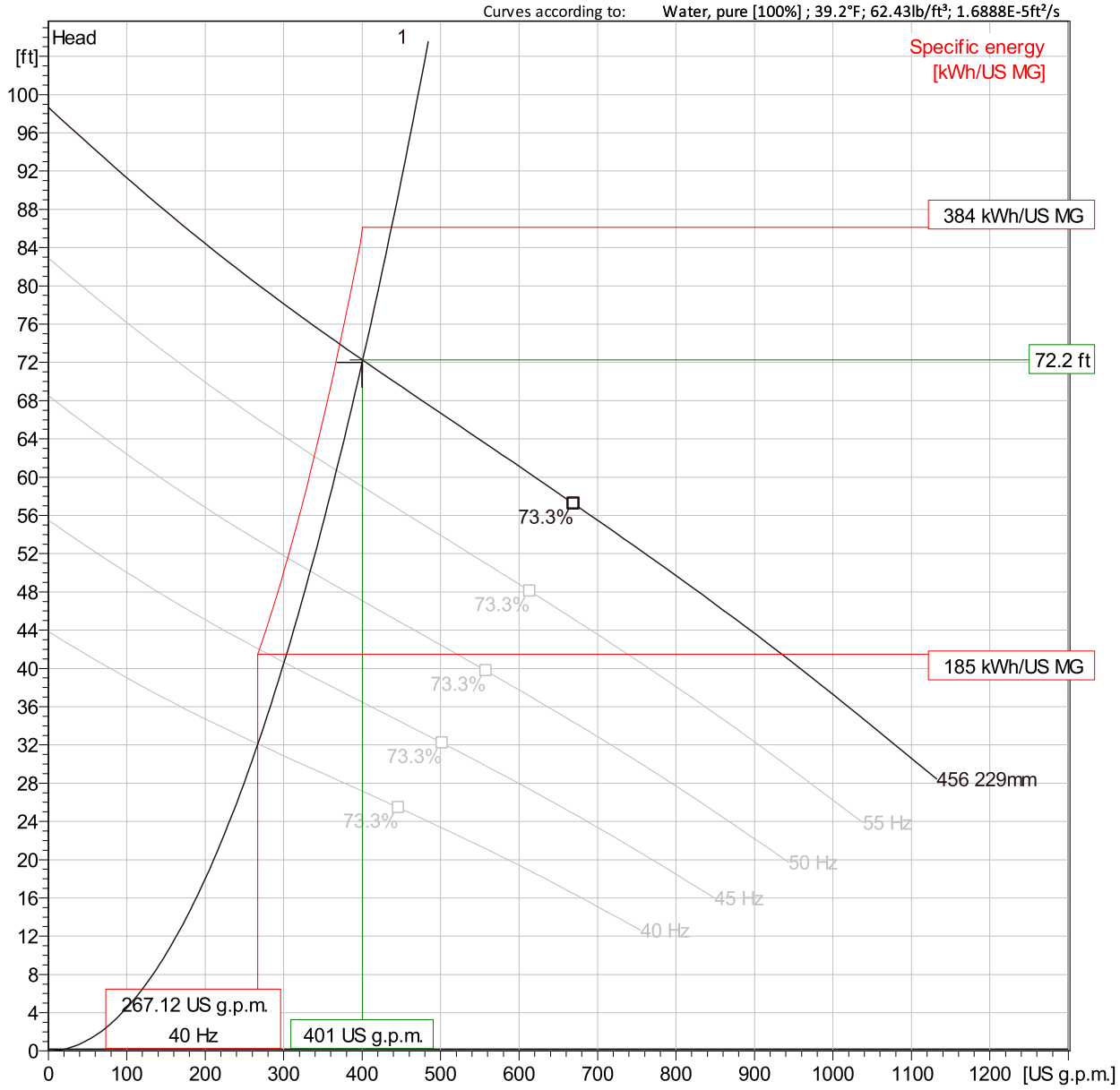
Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	60 Hz	401	72.2	11	401	72.2	11	66.9 %	384	15.7
1	55 Hz	367	60.7	8.44	367	60.7	8.44	66.9 %	322	13.7
1	50 Hz	334	50.2	6.34	334	50.2	6.34	66.9 %	269	11.8
1	45 Hz	301	40.6	4.62	301	40.6	4.62	66.9 %	224	9.93

Project		**Created by**	Garrett Queener		
Block	0	**Created on**	10/7/2022	**Last update**	10/7/2022

NP 3153 HT 3~ 456

VFD Analysis

Curves according to: Water, pure [100%] ; 39.2°F; 62.43lb/ft³; 1.6888E-5ft²/s



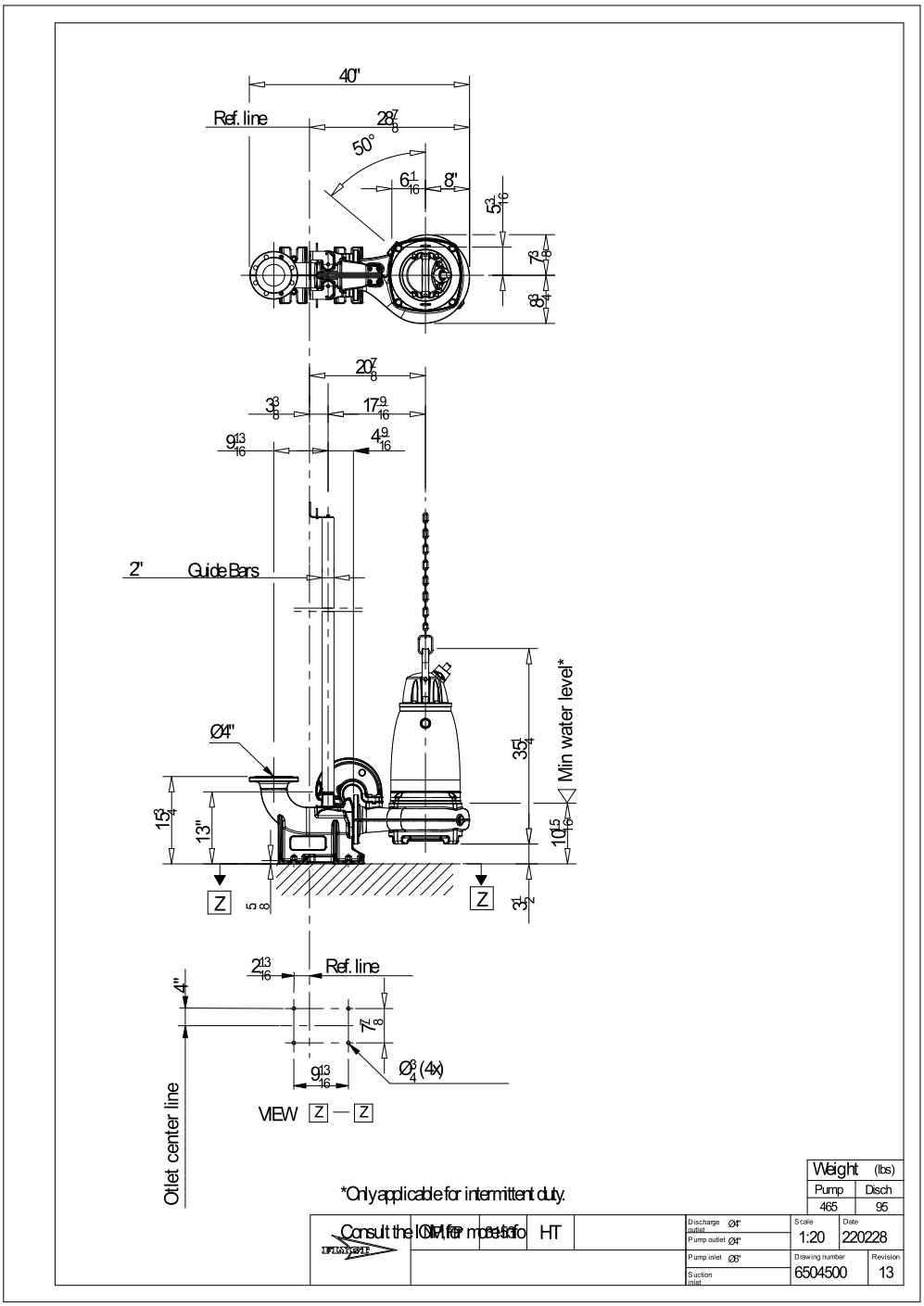
Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	40 Hz	267	32.1	3.25	267	32.1	3.25	66.9 %	185	8.23

Project		**Created by**	Garrett Queener		
Block	0	**Created on**	10/7/2022	**Last update**	10/7/2022

NP 3153 HT 3~ 456

Dimensional drawing



Project		**Created by**	Garrett Queener		
Block	0	**Created on**	10/7/2022	**Last update**	10/7/2022

N

1" = 600'

TOWNHALL
LIFT STATION

LAKESHORE
LIFT STATION

12" FM

2" FM

3" FM

10" FM

8" FM

8" FM

4" FM

TALICHET
LIFT STATION

8" FM

8" FM

VENEZIA
LS #2

6" FM

VENEZIA
LS #1

LIFT STATION

LIFT STATION

LIFT STATION

LIFT STATION

WASTEWATER MASTER PLAN

Town of Howey in the Hills

Public Wastewater System

Prepared For:

Prepared By:

BESH
BOOTH ERN STRAUGHAN HIOTT
ENGINEERS • SURVEYORS
LAND PLANNERS

October 2018

APPENDIX C

Venezia's Existing Lift Station Calculations

LIFT STATION CALCULATIONS

Venezia Lift Station #1

I. Design Flow Rates:

Parcel ID	Land Use Description	Unit Description	Units	Unit Flow (GPD/Unit)	Average Daily Flow (GPD)	Average Daily Flow (GPM)	Minimum Daily Flow (GPM)	Maximum Daily Flow (GPM)	Peak Daily Flow (GPM)
1	*Residential - SF (detached)*	dwelling unit	94	300	28,200	20	10	39	78
2	*Commercial - Shopping Center*	square feet	70,000	0.1	7,000	5	2	10	19
3	*Commercial - Shopping Center - Deli*	square feet	500	0.4	200	0.1	0.1	0.3	0.6
4	*Commercial - Shopping Center - Bakery*	square feet	500	0.4	200	0.1	0.1	0.3	0.6
5	*Commercial - Shopping Center - Meat*	square feet	500	0.75	375	0.3	0.1	0.5	1.0
6	*Commercial - Restaurant <16 hrs*	seat	300	40	12,000	8	4	17	33
7					0	0	0	0	0
8					0	0	0	0	0
9					0	0	0	0	0
10					0	0	0	0	0
				Total	47,975	33	17	67	133
							F_{min}	F_{max}	F_{peak}
					Design Peaking Factors:		0.5	2.0	4.0

II. Wet Well Dimensions:

Wet Well Configuration:	***Duplex***	
No. of Wet Wells:	***1***	
Layout:	***Circular***	
Inner Diameter =	8.00	feet
Volume =	376	gallons/foot
Total Volume =	**376**	gallons/foot
Wall Thickness =	8	inches
Outer Diameter =	9.33	feet
Slab Lip =	18	inches
Slab Diameter =	12.33	feet
Slab Thickness =	12	inches

III. Minimum Cycle Time & Storage Volume:

$T = (V / (Q-S)) + (V/S)$
Note: T_{min} occurs when S = 1/2Q (Duplex)
$V = (QT / 4)$

Where: T = Cycle Time (Min.)
S = Peak Inflow (gpm)
Q = Pump Discharge (gpm)
V = Req. Storage Vol. (gal.)

For Minimum T =	10	Min.
S =	147	GPM
Q =	294	GPM (per pump)
Then V =	735	Gallons
Min. Storage Depth =	1.95	**Feet** (Pump ON - Pump OFF)

Cycle Time for Peak Flow Condition, T = 10 Minutes > 5 minutes, OK

Note: Allow an additional 50% Storage Depth for Triplx and 100% for Quadplex
Note: Rule of Thumb: Min. Q = 150 gpm

IV. Wet Well Control Levels:

Wet Well Top Elevation	**89.00**	
Assume Ground Water Table @ Elevation	88.50	
Influent Gravity Sewer Invert Elev.	71.54	
Freeboard =	0.54	Feet
Audible Alarm ON Elevation	71.00	
Freeboard =	1.00	Feet
~~4TH Pump & Alarm Light ON Elev.~~	~~0.00~~	
~~Freeboard =~~	~~0.00~~	~~Feet~~
~~3RD Pump & Alarm Light ON Elev.~~	~~0.00~~	
~~Freeboard =~~	~~0.00~~	~~Feet~~
2ND Pump & Alarm Light ON Elev.	70.00	
Freebaord =	1.00	Feet
Lead Pump ON Elev.	69.00	
Storage Depth =	4.00	Feet
Both Pumps OFF Elev.	65.00	
Sump Depth =	1.50	Feet
Wet Well Bottom Elevation	**63.50**	
Total Depth of Wet Well =	25.50	Feet
Station Yard Finish Grade Elevation =	88.50	
Minimum Station Yard Width =	25.0	Feet
Min. Station Easement Length & Width =	59.3	Feet
Forcemain High Point Elevation =	125.00	ft
Connection Point Elevation =	0.00	ft
Connection Pressure =	0.00	psi
Static Head for Pumps =	**60.00**	**Feet**

V. Buoyancy Calculation:

Structure Rim El. =	89.00	feet
Structure Base El. =	63.50	feet
Structure Depth =	25.50	feet
Structure Volume =	1,282	CF
Wall Volume =	463	CF
Slab Volume =	119	CF
Volume of Concrete =	582	CF
Density of Concrete =	144	lbs/CF
Weight of Concrete =	83,855	lbs.
Volume of Soil Above Slab =	1,302	CF
Density of Soil =	47	lbs/CF
Weight of Soil Above Slab =	61,184	lbs.
Total Resistance Force =	**145,040**	**lbs.**
Ground Water Table @ Elevation	88.50	feet
Volume of Water Displaced =	1,830	CF
Density of Water =	62.4	lbs/CF
Total Uplift Force =	**114,185**	**lbs.**
Factor of Safety =	**1.3**	

LIFT STATION CALCULATIONS (Cont'd)
Venezia Lift Station #1

VI. Calculation of System Head Curve:

Total Static Head = 60.00 Feet

		Station Piping	Force Main Piping			
			New On-Site	New On-Site	New Off-Site	N/A
Pipe Length (feet)		27	947	5,600	3,140	0
Pipe Inside Dia. (inches)		6	6	8	10	12
Pipe Area (Sq.-Ft.)		0.196	0.196	0.349	0.545	0.785
Pipe Material		DIP	PVC	PVC	PVC	PVC
Roughness C		100	120	120	120	120
Fittings:	K-Value	No. / Tot K	No. / Tot K	No. / Tot K	No. / Tot K	No. / Tot K
Discharge	1.0	1 / 1.0	0 / 0.0	0 / 0.0	1 / 1.0	0 / 0.0
90° Bend	0.6	2 / 1.2	0 / 0.0	0 / 0.0	2 / 1.2	0 / 0.0
45° Bend	0.4	2 / 0.8	4 / 1.6	4 / 1.6	4 / 1.6	0 / 0.0
22.5° Bend	0.25	0 / 0.0	4 / 1.0	4 / 1.0	4 / 1.0	0 / 0.0
11.25° Bend	0.15	0 / 0.0	0 / 0	0 / 0.0	0 / 0.0	0 / 0.0
Expansion	0.5	0 / 0.0	1 / 0.5	1 / 0.5	0 / 0.0	0 / 0.0
Plug Valve	0.4	1 / 0.4	1 / 0.4	6 / 2.4	3 / 1.2	0 / 0.0
Check Valve	2.5	1 / 2.5	0 / 0.0	0 / 0.0	0 / 0.0	0 / 0.0
Wye Branch	0.5	1 / 0.5	0 / 0.0	0 / 0.0	0 / 0.0	0 / 0.0
Contraction	0.5	0 / 0.0	0 / 0.0	0 / 0.0	0 / 0.0	0 / 0.0
Total K-Value		6.4	3.5	5.5	6.0	0.0

Pump Selection *Flygt* *15* hp
Model: NP3151. Curve: 63-464-00-4550
Impeller: 253 mm
No. Pumps In Parallel = *1* Duplex
Operating Point = 294 gpm @ 87 ft TDH
OP 2 Pumps = gpm @ ft TDH
OP 3 pumps = gpm @ ft TDH

Wet Well Area = 50.3 sf per wet well
Pump On El. = 69.00 ft
Pump Off El. = 65.00 ft
Storage Volume = 201 cf
1,504 gallons per wet well

Pump On Time = Storage Volume / (Outflow - Inflow)
= 9.4 minutes (Peak)
= 5.8 minutes (Average)
Pump Off Time = Storage Volume / (Inflow)
= 11.3 minutes (Peak)
= 45.1 minutes (Average)

Inflow = 33 gpm (Average)
Inflow = 133 gpm (Peak)
Outflow = 294 gpm

Step Interval = 25 gpm Add. Manifold Flows (gpm): 6: 0; 8: 0; 10: 0; 12: 0

System Head Curve

Q (gpm)	6 Pipe (ft)	6 Fittings (ft)	6 Velocity (fps)	6 Pipe (ft)	6 Fittings (ft)	6 Velocity (fps)	8 Pipe (ft)	8 Fittings (ft)	8 Velocity (fps)	10 Pipe (ft)	10 Fittings (ft)	10 Velocity (fps)	12 Pipe (ft)	12 Fittings (ft)	12 Velocity (fps)	Friction Head (feet)	TDH (feet)
	Pipe & Fitting Friction Losses in Feet - Velocity in Feet per Second																
0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	**60.00**
25	0.00	0.01	0.3	0.09	0.00	0.3	0.13	0.00	0.2	0.02	0.00	0.1	0.00	0.00	0.0	0.27	**60.27**
50	0.02	0.03	0.6	0.33	0.02	0.6	0.47	0.01	0.3	0.09	0.00	0.2	0.00	0.00	0.0	0.96	**60.96**
75	0.04	0.07	0.9	0.69	0.04	0.9	0.99	0.02	0.5	0.19	0.01	0.3	0.00	0.00	0.0	2.05	**62.05**
100	0.07	0.13	1.1	1.17	0.07	1.1	1.69	0.03	0.6	0.32	0.02	0.4	0.00	0.00	0.0	3.50	**63.50**
125	0.10	0.20	1.4	1.78	0.11	1.4	2.55	0.05	0.8	0.49	0.02	0.5	0.00	0.00	0.0	5.31	**65.31**
150	0.14	0.29	1.7	2.49	0.16	1.7	3.58	0.08	1.0	0.68	0.03	0.6	0.00	0.00	0.0	7.45	**67.45**
175	0.19	0.39	2.0	3.31	0.21	2.0	4.76	0.11	1.1	0.91	0.05	0.7	0.00	0.00	0.0	9.93	**69.93**
200	0.25	0.51	2.3	4.24	0.28	2.3	6.10	0.14	1.3	1.16	0.06	0.8	0.00	0.00	0.0	12.74	**72.74**
225	0.31	0.65	2.6	5.28	0.35	2.6	7.58	0.18	1.4	1.44	0.08	0.9	0.00	0.00	0.0	15.87	**75.87**
250	0.38	0.80	2.8	6.42	0.44	2.8	9.21	0.22	1.6	1.75	0.10	1.0	0.00	0.00	0.0	19.31	**79.31**
275	0.45	0.97	3.1	7.65	0.53	3.1	10.99	0.26	1.8	2.09	0.12	1.1	0.00	0.00	0.0	23.07	**83.07**
294	0.51	1.11	3.3	8.66	0.60	3.3	12.44	0.30	1.9	2.37	0.13	1.2	0.00	0.00	0.0	26.13	**86.13**
300	0.53	1.15	3.4	8.99	0.63	3.4	12.91	0.31	1.9	2.46	0.14	1.2	0.00	0.00	0.0	27.13	**87.13**
325	0.62	1.35	3.7	10.43	0.74	3.7	14.97	0.37	2.1	2.85	0.16	1.3	0.00	0.00	0.0	31.50	**91.50**
350	0.71	1.57	4.0	11.97	0.86	4.0	17.18	0.43	2.2	3.27	0.19	1.4	0.00	0.00	0.0	36.17	**96.17**
375	0.81	1.80	4.3	13.60	0.98	4.3	19.51	0.49	2.4	3.71	0.22	1.5	0.00	0.00	0.0	41.13	**101.13**
400	0.92	2.05	4.5	15.33	1.12	4.5	21.99	0.56	2.6	4.19	0.25	1.6	0.00	0.00	0.0	46.39	**106.39**
425	1.03	2.31	4.8	17.15	1.26	4.8	24.60	0.63	2.7	4.68	0.28	1.7	0.00	0.00	0.0	51.95	**111.95**
450	1.15	2.59	5.1	19.06	1.42	5.1	27.35	0.70	2.9	5.21	0.31	1.8	0.00	0.00	0.0	57.79	**117.79**
475	1.27	2.89	5.4	21.07	1.58	5.4	30.22	0.78	3.0	5.75	0.35	1.9	0.00	0.00	0.0	63.93	**123.93**
500	1.41	3.20	5.7	23.18	1.75	5.7	33.23	0.87	3.2	6.33	0.39	2.0	0.00	0.00	0.0	70.35	**130.35**
525	1.54	3.53	6.0	25.37	1.93	6.0	36.37	0.96	3.4	6.93	0.43	2.1	0.00	0.00	0.0	77.05	**137.05**
550	1.69	3.87	6.2	27.65	2.12	6.2	39.65	1.05	3.5	7.55	0.47	2.2	0.00	0.00	0.0	84.04	**144.04**
575	1.83	4.23	6.5	30.03	2.31	6.5	43.04	1.15	3.7	8.20	0.51	2.3	0.00	0.00	0.0	91.31	**151.31**
600	1.99	4.61	6.8	32.49	2.52	6.8	46.57	1.25	3.8	8.87	0.56	2.5	0.00	0.00	0.0	98.86	**158.86**
625	2.15	5.00	7.1	35.05	2.73	7.1	50.23	1.36	4.0	9.56	0.61	2.6	0.00	0.00	0.0	106.68	**166.68**
650	2.32	5.41	7.4	37.69	2.96	7.4	54.01	1.47	4.1	10.28	0.66	2.7	0.00	0.00	0.0	114.79	**174.79**
675	2.49	5.83	7.7	40.42	3.19	7.7	57.92	1.59	4.3	11.03	0.71	2.8	0.00	0.00	0.0	123.16	**183.16**
700	2.67	6.27	7.9	43.24	3.43	7.9	61.95	1.70	4.5	11.80	0.76	2.9	0.00	0.00	0.0	131.81	**191.81**
725	2.85	6.72	8.2	46.14	3.68	8.2	66.10	1.83	4.6	12.59	0.82	3.0	0.00	0.00	0.0	140.74	**200.74**
750	3.04	7.20	8.5	49.13	3.94	8.5	70.39	1.96	4.8	13.40	0.87	3.1	0.00	0.00	0.0	149.93	**209.93**

LIFT STATION CALCULATIONS

Venezia Lift Station #2

I. Design Flow Rates:

Parcel ID	Land Use Description	Unit Description	Units	Unit Flow (GPD/Unit)	Average Daily Flow (GPD)	Average Daily Flow (GPM)	Minimum Daily Flow (GPM)	Maximum Daily Flow (GPM)	Peak Daily Flow (GPM)
1	*Residential - SF (detached)*	dwelling unit	77	300	23,100	16	8	32	64
2	*Residential - SF (attached)*	dwelling unit	113	300	33,900	24	12	47	94
3	*Institutional - School*	student	494	33	16,302	11	6	23	45
4					0	0	0	0	0
5					0	0	0	0	0
6					0	0	0	0	0
7					0	0	0	0	0
8					0	0	0	0	0
9					0	0	0	0	0
10					0	0	0	0	0
				Total	73,302	51	25	102	204
							F_{min}	F_{max}	F_{peak}
						Design Peaking Factors:	0.5	2.0	4.0

II. Wet Well Dimensions:

Wet Well Configuration:	***Duplex***	
No. of Wet Wells:	*1*	
Layout:	***Circular***	
Inner Diameter =	8.00	feet
Volume =	376	gallons/foot
Total Volume =	**376**	gallons/foot
Wall Thickness =	8	inches
Outer Diameter =	9.33	feet
Slab Lip =	18	inches
Slab Diameter =	12.33	feet
Slab Thickness =	12	inches

III. Minimum Cycle Time & Storage Volume:

$T = (V / (Q-S)) + (V/S)$
Note: T_{min} occurs when S = 1/2Q (Duplex)
$V = (QT / 4)$

Where: T = Cycle Time (Min.)
S = Peak Inflow (gpm)
Q = Pump Discharge (gpm)
V = Req. Storage Vol. (gal.)

For Minimum T =	10	Min.
S =	163	GPM
Q =	326	GPM (per pump)
Then V =	815	Gallons
Min. Storage Depth =	**2.17**	**Feet** (Pump ON - Pump OFF)

Cycle Time for Peak Flow Condition, T = 10 Minutes > 5 minutes, OK

Note: Allow an additional 50% Storage Depth for Triplx and 100% for Quadplex
Note: Rule of Thumb: Min. Q = 150 gpm

IV. Wet Well Control Levels:

Wet Well Top Elevation	**82.00**	
Assume Ground Water Table @ Elevation	81.50	
Influent Gravity Sewer Invert Elev.	61.72	
Freeboard =	0.72	Feet
Audible Alarm ON Elevation	61.00	
Freeboard =	1.00	Feet
~~4TH Pump & Alarm Light ON Elev.~~	~~0.00~~	
~~Freeboard =~~	~~0.00~~	~~Feet~~
~~3RD Pump & Alarm Light ON Elev.~~	~~0.00~~	
~~Freeboard =~~	~~0.00~~	~~Feet~~
2ND Pump & Alarm Light ON Elev.	60.00	
Freebaord =	1.00	Feet
Lead Pump ON Elev.	59.00	
Storage Depth =	3.00	Feet
Both Pumps OFF Elev.	56.00	
Sump Depth =	1.50	Feet
Wet Well Bottom Elevation	**54.50**	
Total Depth of Wet Well =	27.50	Feet
Station Yard Finish Grade Elevation =	81.50	
Minimum Station Yard Width =	27.0	Feet
Min. Station Easement Length & Width =	63.3	Feet
Forcemain High Point Elevation =	125.00	ft
Connection Point Elevation =	0.00	ft
Connection Pressure =	0.00	psi
Static Head for Pumps =	**69.00**	**Feet**

V. Buoyancy Calculation:

Structure Rim El. =	82.00	feet
Structure Base El. =	54.50	feet
Structure Depth =	27.50	feet
Structure Volume =	1,382	CF
Wall Volume =	499	CF
Slab Volume =	119	CF
Volume of Concrete =	619	CF
Density of Concrete =	144	lbs/CF
Weight of Concrete =	89,083	lbs.
Volume of Soil Above Slab =	1,404	CF
Density of Soil =	47	lbs/CF
Weight of Soil Above Slab =	65,983	lbs.
Total Resistance Force =	**155,066**	**lbs.**
Ground Water Table @ Elevation	81.50	feet
Volume of Water Displaced =	1,967	CF
Density of Water =	62.4	lbs/CF
Total Uplift Force =	**122,724**	**lbs.**
Factor of Safety =	**1.3**	

11/15/2007

LIFT STATION CALCULATIONS (Cont'd)
Venezia Lift Station #2

VI. Calculation of System Head Curve:

Total Static Head = 69.00 Feet

Pump Selection *Flygt* *15* hp
Model: CP3152. Curve: 63-487-00-3855
Impeller: 265 mm
No. Pumps in Parallel = *1* Duplex
Operating Point = 326 gpm @ 94 ft TDH
OP 2 Pumps = gpm @ ft TDH
OP 3 pumps = gpm @ ft TDH

		Station Piping		Force Main Piping: New On-Site		New On-Site		New Off-Site		N/A	
Pipe Length (feet)		30		1,260		5,600		3,140		0	
Pipe Inside Dia. (inches)		*6*		*8*		*8*		*10*		*12*	
Pipe Area (Sq.-Ft.)		0.196		0.349		0.349		0.545		0.785	
Pipe Material		*DIP*		*PVC*		*PVC*		*PVC*		*PVC*	
Roughness C		100		120		120		120		120	
Fittings:	K-Value	No.	Tot K	No.	Tot K	No.	Tot K	No.	Tot K	No.	Tot K
Discharge	1.0	1	1.0	0	0.0	0	0.0	1	1.0	0	0.0
90° Bend	0.6	2	1.2	0	0.0	0	0.0	2	1.2	0	0.0
45° Bend	0.4	2	0.8	4	1.6	4	1.6	4	1.6	0	0.0
22.5° Bend	0.25	0	0.0	4	1.0	4	1.0	4	1.0	0	0.0
11.25° Bend	0.15	0	0.0	0	0	0	0.0	0	0.0	0	0.0
Expansion	0.5	0	0.0	1	0.5	1	0.5	0	0.0	0	0.0
Plug Valve	0.4	1	0.4	2	0.8	6	2.4	3	1.2	0	0.0
Check Valve	2.5	1	2.5	0	0.0	0	0.0	0	0.0	0	0.0
Wye Branch	0.5	1	0.5	0	0.0	0	0.0	0	0.0	0	0.0
Contraction	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total K-Value			6.4		3.9		5.5		6.0		0.0

Wet Well Area = 50.3 sf per wet well
Pump On El. = 59.00 ft
Pump Off El. = 56.00 ft
Storage Volume = 151 cf
1,128 gallons per wet well

Pump On Time = Storage Volume / (Outflow - Inflow)
= 9.2 minutes (Peak)
= 4.1 minutes (Average)
Pump Off Time = Storage Volume / (Inflow)
= 5.5 minutes (Peak)
= 22.2 minutes (Average)

Inflow = 51 gpm (Average)
Inflow = 204 gpm (Peak)
Outflow = 326 gpm

Step Interval = 25 gpm Add. Manifold Flows (gpm): 8: 0; 8: 0; 10: 0; 12: 0

System Head Curve

Q (gpm)	6 Pipe (ft)	6 Fittings (ft)	6 Velocity (fps)	8 Pipe (ft)	8 Fittings (ft)	8 Velocity (fps)	8 Pipe (ft)	8 Fittings (ft)	8 Velocity (fps)	10 Pipe (ft)	10 Fittings (ft)	10 Velocity (fps)	12 Pipe (ft)	12 Fittings (ft)	12 Velocity (fps)	Friction Head (feet)	TDH (feet)
	Pipe & Fitting Friction Losses in Feet - Velocity in Feet per Second																
0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	**69.00**
25	0.01	0.01	0.3	0.03	0.00	0.2	0.13	0.00	0.2	0.02	0.00	0.1	0.00	0.00	0.0	0.20	**69.20**
50	0.02	0.03	0.6	0.11	0.01	0.3	0.47	0.01	0.3	0.09	0.00	0.2	0.00	0.00	0.0	0.73	**69.73**
75	0.04	0.07	0.9	0.23	0.01	0.5	0.99	0.02	0.5	0.19	0.01	0.3	0.00	0.00	0.0	1.56	**70.56**
100	0.07	0.13	1.1	0.39	0.02	0.6	1.69	0.03	0.6	0.32	0.02	0.4	0.00	0.00	0.0	2.67	**71.67**
125	0.11	0.20	1.4	0.58	0.04	0.8	2.55	0.05	0.8	0.49	0.02	0.5	0.00	0.00	0.0	4.05	**73.05**
150	0.15	0.29	1.7	0.82	0.06	1.0	3.58	0.08	1.0	0.68	0.03	0.6	0.00	0.00	0.0	5.69	**74.69**
175	0.21	0.39	2.0	1.09	0.08	1.1	4.76	0.11	1.1	0.91	0.05	0.7	0.00	0.00	0.0	7.58	**76.58**
200	0.26	0.51	2.3	1.39	0.10	1.3	6.10	0.14	1.3	1.16	0.06	0.8	0.00	0.00	0.0	9.73	**78.73**
225	0.33	0.65	2.6	1.73	0.12	1.4	7.58	0.18	1.4	1.44	0.08	0.9	0.00	0.00	0.0	12.11	**81.11**
250	0.40	0.80	2.8	2.10	0.15	1.6	9.21	0.22	1.6	1.75	0.10	1.0	0.00	0.00	0.0	14.74	**83.74**
275	0.48	0.97	3.1	2.51	0.19	1.8	10.99	0.26	1.8	2.09	0.12	1.1	0.00	0.00	0.0	17.61	**86.61**
300	0.57	1.15	3.4	2.95	0.22	1.9	12.91	0.31	1.9	2.46	0.14	1.2	0.00	0.00	0.0	20.72	**89.72**
325	0.66	1.35	3.7	3.42	0.26	2.1	14.97	0.37	2.1	2.85	0.16	1.3	0.00	0.00	0.0	24.05	**93.05**
326	0.67	1.36	3.7	3.44	0.26	2.1	15.06	0.37	2.1	2.87	0.17	1.3	0.00	0.00	0.0	24.19	**93.19**
350	0.77	1.57	4.0	3.92	0.30	2.2	17.18	0.43	2.2	3.27	0.19	1.4	0.00	0.00	0.0	27.62	**96.62**
375	0.87	1.80	4.3	4.46	0.35	2.4	19.51	0.49	2.4	3.71	0.22	1.5	0.00	0.00	0.0	31.41	**100.41**
400	0.99	2.05	4.5	5.03	0.39	2.6	21.99	0.56	2.6	4.19	0.25	1.6	0.00	0.00	0.0	35.44	**104.44**
425	1.11	2.31	4.8	5.62	0.45	2.7	24.60	0.63	2.7	4.68	0.28	1.7	0.00	0.00	0.0	39.68	**108.68**
450	1.23	2.59	5.1	6.25	0.50	2.9	27.35	0.70	2.9	5.21	0.31	1.8	0.00	0.00	0.0	44.15	**113.15**
475	1.37	2.89	5.4	6.91	0.56	3.0	30.22	0.78	3.0	5.75	0.35	1.9	0.00	0.00	0.0	48.83	**117.83**
500	1.51	3.20	5.7	7.60	0.62	3.2	33.23	0.87	3.2	6.33	0.39	2.0	0.00	0.00	0.0	53.74	**122.74**
525	1.65	3.53	6.0	8.32	0.68	3.4	36.37	0.96	3.4	6.93	0.43	2.1	0.00	0.00	0.0	58.87	**127.87**
550	1.81	3.87	6.2	9.07	0.75	3.5	39.65	1.05	3.5	7.55	0.47	2.2	0.00	0.00	0.0	64.21	**133.21**
575	1.96	4.23	6.5	9.85	0.82	3.7	43.04	1.15	3.7	8.20	0.51	2.3	0.00	0.00	0.0	69.76	**138.76**
600	2.13	4.61	6.8	10.66	0.89	3.8	46.57	1.25	3.8	8.87	0.56	2.5	0.00	0.00	0.0	75.53	**144.53**
625	2.30	5.00	7.1	11.49	0.96	4.0	50.23	1.36	4.0	9.56	0.61	2.6	0.00	0.00	0.0	81.51	**150.51**
650	2.48	5.41	7.4	12.36	1.04	4.1	54.01	1.47	4.1	10.28	0.66	2.7	0.00	0.00	0.0	87.71	**156.71**
675	2.66	5.83	7.7	13.25	1.12	4.3	57.92	1.59	4.3	11.03	0.71	2.8	0.00	0.00	0.0	94.11	**163.11**
700	2.86	6.27	7.9	14.18	1.21	4.5	61.95	1.70	4.5	11.80	0.76	2.9	0.00	0.00	0.0	100.72	**169.72**
725	3.05	6.72	8.2	15.13	1.30	4.6	66.10	1.83	4.6	12.59	0.82	3.0	0.00	0.00	0.0	107.54	**176.54**
750	3.26	7.20	8.5	16.11	1.39	4.8	70.39	1.96	4.8	13.40	0.87	3.1	0.00	0.00	0.0	114.57	**183.57**

APPENDIX D

Venezia's Existing Lift Station Record Drawings

RTU SYSTEM SPECIFICATIONS:

1. A MICROPROCESSOR-BASED PUMP CONTROLLER/TRANSCEIVER (CC) MODEL SIEMENS WATER TECHNOLOGIES LC-150 SHALL BE PROVIDED.

2. THE RTU SHALL BE MOUNTED IN A NEMA 3R 316 STAINLESS STEEL ENCLOSURE ADJACENT TO THE PUMP CONTROL PANEL AND SHALL BE PROVIDED WITH A CLASS II UL LISTED TRANSFORMER/POWER SUPPLY.

3. STANDARDS:
   A. FCC PART 15, SUBPART J, CLASS A - RADIO EMISSIONS
   B. ANSI/IEEE C37.90 - SURGE WITHSTAND CAPABILITY
   C. ANSI/IPC-S815A - QUALITY CONTROL

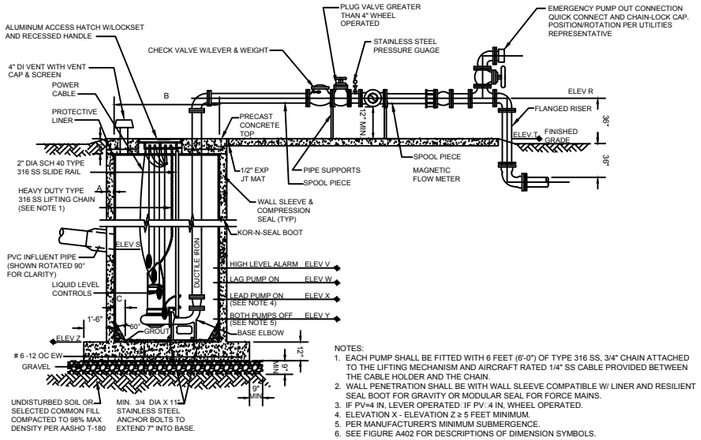
4. APPROVED SYSTEM SUPPLIER IS SIEMENS WATER TECHNOLOGIES. CONTACT RON ROBINETTE 800-247-0880.

GENERAL NOTES:

1. COATING SHALL BE AS SCHEDULED IN TABLE BELOW.
2. ALL LOCATIONS WHERE GRAVITY PIPES ENTER OR LEAVE THE WET WELL SHALL BE MADE WATERTIGHT WITH AN APPROVED BOOT.
3. ALL LOCATIONS WHERE PRESSURE PIPES ENTER THE WET WELL SHALL BE MADE WATERTIGHT WITH A WALL SLEEVE AND SEAL.
4. THERE SHALL BE NO VALVES OR ELECTRICAL JUNCTION BOXES IN THE WET WELL.
5. WET WELL COVERS SHALL BE ALUMINUM WITH 316 STAINLESS STEEL HARDWARE WITH LOCK BRACKET.
6. ALL HARDWARE IN WET WELL SHALL BE 316 STAINLESS STEEL.
7. PUMP SUBMERGENCE REQUIREMENTS SHALL BE MET AS MINIMUM.
8. ALL CONNECTIONS IN THE WET WELL SHALL BE FLANGED JOINTS. ALL REMAINING CONNECTIONS BETWEEN THE WET WELL AND THE CONNECTION TO THE FORCE MAIN SHALL BE RESTRAINED MECHANICAL JOINTS.
9. CHECK VALVE ARM SHALL BE LOCATED WITH THE SAME ORIENTATION (□□ ALL ARMS ON THE LEFT SIDE OF VALVE).

PUMP STATION COATING SCHEDULE		
AREA	APPLICABLE COATING	NOTES
O□□d□□□W□□W□□	"S□r□□□C□□□□□- E□□r□r"	C□□□□□CS-S5
I□□d□□□W□□W□□	"W□□W□□L□□□□S□□□□□"	S□□r□□□PG□r □□□r□□□d □□□□□
F□□□□d B□□□□ □□W□□ W□□	100% □□□d□E□□□□□□r □□□□□ □□□□□□□r□r"□r□□□□ □ □d□□□□	M□□□□□□r□r□□r□□□□r□r□□□□□ □□□□r
W□□W□□P□□□□	"D□□□□Ir□□P□□□C□□□□□ □□d L□□□□(□r □□□□P□□□S□□□□W□□W□□□)	Pr□□□□□401 C□r□□ □E□□□□
E□□□□d M□□□□E□□□□□ S□□□□□□□S□□□□d A□□ □□□□	"P□□□□□F□□□A□r□P□□□□(F□d Pr□□r) □d P□□□□F□□□□(E□□r□r)"	T□□□ □□: 37-77 H C□□□-Pr□r T□□□ □□: G□□□2H F□□□

PUMP STATION GENERAL NOTES

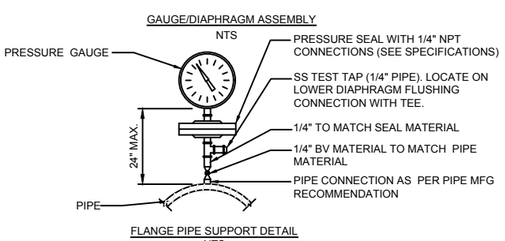


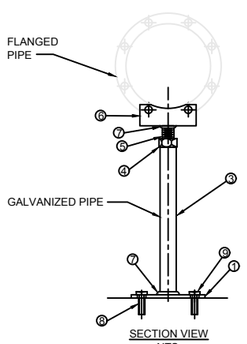
NOTES:
1. EACH PUMP SHALL BE FITTED WITH 6 FEET (6'-0") OF TYPE 316 SS, 3/4" CHAIN ATTACHED TO THE LIFTING MECHANISM AND AIRCRAFT RATED 1/4" SS CABLE PROVIDED BETWEEN THE CABLE HOLDER AND THE CHAIN.
2. WALL PENETRATION SHALL BE WITH WALL SLEEVE COMPATIBLE W/ LINER AND RESILIENT SEAL BOOT FOR GRAVITY OR MODULAR SEAL FOR FORCE MAINS.
3. IF PV=4 IN, LEVER OPERATED. IF PV .4 IN, WHEEL OPERATED.
4. ELEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM.
5. PER MANUFACTURER'S MINIMUM SUBMERGENCE.
6. SEE FIGURE A402 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
7. INSIDE OF WETWELL TO BE LINED WITH SUPERCOAT PG.

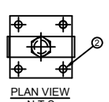
NOTES:
1. IF PV=4 IN, LEVER OPERATED□IF PV□4 IN, WHEEL OPERATED.
2.SEE FIGURE A402 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.

DUPLEX PUMP STATION PLAN

FIGURE A404-2







LEGEND
1. BASE
2. MOUNTING HOLE (4-TYP)
3. SUPPORT COLUMN
4. HEIGHT ADJUSTMENT NUT
5. SUPPORT SHAFT - THREADED
6. PIPE SUPPORT FLANGE
7. WELD
8. ANCHOR (4-TYP)
9. LAG BOLT (4-TYP)

NOTE:
1. ALL PIPING TO BE 316 SS OR BRASS

PUMP DATA

WETWELL INSIDE DIA. 8'0"
FLYGT *SUBMERSIBLE PUMPS*
MODEL NUMBER NP3153.181
IMPELLER 253
HORSE POWER 15
G.P.M. 294 *T.D.H.* 87.0
ELECTRICAL REQUIREMENTS 230 V
3 PHASE □

□ NOTE: ELECTRICAL REQUIREMENT TO BE VERIFIED BY CONTRACTOR.

DESCRIPTION	SYMBOL	DIMENSION	ELEVATION
THICKNESS OF WALL	A	8"	—
DIAMETER OF WET WELL	B	8'	—
WIDTH OF BOTTOM FILLET	C	SEE NOTE 1	—
C/L TO C/L OF PUMPS	D	SEE NOTE 1	—
LENGTH OF PUMP ACCESS OPENING	E	SEE NOTE 1	—
WIDTH OF PUMP ACCESS OPENING	F	SEE NOTE 1	—
BASE ELBOW TO EDGE OF PIT	G	SEE NOTE 1	—
VALVE BOX HATCH OPENING	H	5.0'	—
VALVE BOX HATCH OPENING	I	7.0'	—
TOP OF WET WELL	T	—	~~92.00'~~ 88.94'
FINISHED GRADE	U	—	88.50'
HIGH LEVEL ALARM	V	—	71.00'
LAG PUMP ON	W	—	70.00'
LEAD PUMP ON	X	SEE NOTE 2	69.00'
PUMPS OFF (TOP OF PUMP VOLUTE)	Y	—	65.00'
FLOOR OF WET WELL	Z	—	~~89.50'~~ 63.33'

NOTE:
1. PER PUMP MANUFACTURER'S REQUIREMENTS
2. ELEVEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM
3. TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1' ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.

LIFT STATION #1

PUMP DATA

WETWELL INSIDE DIA. 8'0"
FLYGT *SUBMERSIBLE PUMPS*
MODEL NUMBER CP3152.181
IMPELLER 265
HORSE POWER 15
G.P.M. 326 *T.D.H.* 94.0
ELECTRICAL REQUIREMENTS 480 V
3 PHASE □

□ NOTE: ELECTRICAL REQUIREMENT TO BE VERIFIED BY CONTRACTOR.

DESCRIPTION	SYMBOL	DIMENSION	ELEVATION
THICKNESS OF WALL	A	8"	—
DIAMETER OF WET WELL	B	8'	—
WIDTH OF BOTTOM FILLET	C	SEE NOTE 1	—
C/L TO C/L OF PUMPS	D	SEE NOTE 1	—
LENGTH OF PUMP ACCESS OPENING	E	SEE NOTE 1	—
WIDTH OF PUMP ACCESS OPENING	F	SEE NOTE 1	—
BASE ELBOW TO EDGE OF PIT	G	SEE NOTE 1	—
VALVE BOX HATCH OPENING	H	5.0'	—
VALVE BOX HATCH OPENING	I	7.0'	—
TOP OF WET WELL	T	—	~~92.00'~~ 82.12'
FINISHED GRADE	U	—	81.50'
HIGH LEVEL ALARM	V	—	61.00'
LAG PUMP ON	W	—	60.00'
LEAD PUMP ON	X	SEE NOTE 2	59.00'
PUMPS OFF (TOP OF PUMP VOLUTE)	Y	—	55.50'
FLOOR OF WET WELL	Z	—	~~64.00'~~ 54.29'

NOTE:
1. PER PUMP MANUFACTURER'S REQUIREMENTS
2. ELEVEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM
3. TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1' ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.

LIFT STATION #2

PUMP DATA

WETWELL INSIDE DIA. 8'0"
FLYGT *SUBMERSIBLE PUMPS*
MODEL NUMBER NP3102
IMPELLER 135
HORSE POWER 6.5
G.P.M. 200 *T.D.H.* 65.0
ELECTRICAL REQUIREMENTS 230 V
3 PHASE □

□ NOTE: ELECTRICAL REQUIREMENT TO BE VERIFIED BY CONTRACTOR.

DESCRIPTION	SYMBOL	DIMENSION	ELEVATION
THICKNESS OF WALL	A	8"	—
DIAMETER OF WET WELL	B	8'	—
WIDTH OF BOTTOM FILLET	C	SEE NOTE 1	—
C/L TO C/L OF PUMPS	D	SEE NOTE 1	—
LENGTH OF PUMP ACCESS OPENING	E	SEE NOTE 1	—
WIDTH OF PUMP ACCESS OPENING	F	SEE NOTE 1	—
BASE ELBOW TO EDGE OF PIT	G	SEE NOTE 1	—
VALVE BOX HATCH OPENING	H	5.0'	—
VALVE BOX HATCH OPENING	I	7.0'	—
TOP OF WET WELL	T	—	82.00'
FINISHED GRADE	U	—	81.50'
HIGH LEVEL ALARM	V	—	69.00'
LAG PUMP ON	W	—	68.00'
LEAD PUMP ON	X	SEE NOTE 2	67.00'
PUMPS OFF (TOP OF PUMP VOLUTE)	Y	—	65.50'
FLOOR OF WET WELL	Z	—	64.00'

NOTE:
1. PER PUMP MANUFACTURER'S REQUIREMENTS
2. ELEVEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM
3. TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1' ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.

LIFT STATION #3

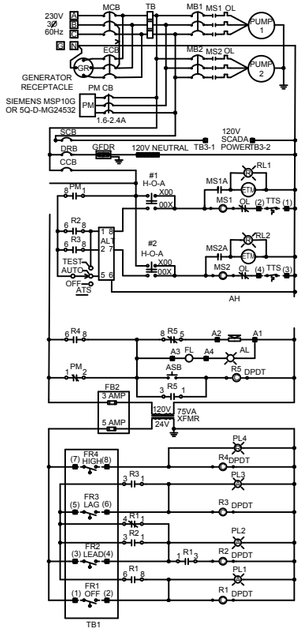
DATE	REVISIONS
1 6-29-07	ADD ALARM HORN
2 7-8-08	CHANGE VOLTAGE FOR 1 AND 3 TO 230
3 4-29-09	A□□□□Dr□□□
4	
5	
6	
7	

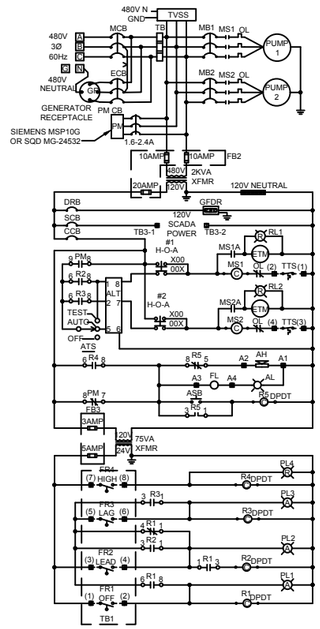
BOOTH ERN STRALEY HOTT & ALMAND
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Tavares, Florida 32778
Office: 352.343.8481
Fax: 352.343.8495
www.besandh.com
Certificate of Authorization Number: 27029

VENEZIA NORTH & SOUTH RESIDENTIAL SUBDIVISION LIFT STATION DETAILS

DESIGNED BY: CCH
PROJECT NO.: 05078.000
DATE: MAY 2007
DRAWN/CHECKED BY: CCH
SHT. 47 OF 52

AS-BUILT DRAWING
CHARLES C. HIOTT, P.E.
PROFESSIONAL ENGINEER 54613

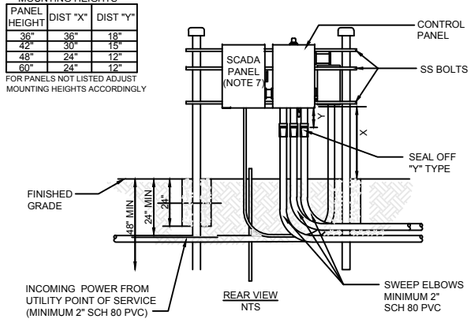




PANEL & SEAL-OFF MOUNTING HEIGHTS

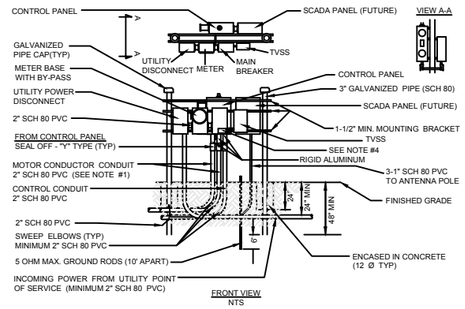
PANEL HEIGHT	DIST "X"	DIST "Y"
36"	36"	18"
42"	30"	15"
48"	24"	12"
60"	24"	12"

FOR PANELS NOT LISTED ADJUST MOUNTING HEIGHTS ACCORDINGLY



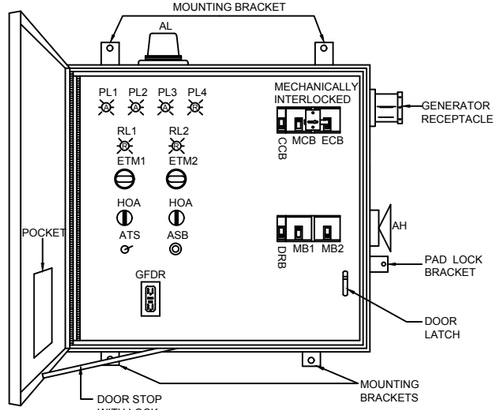
PANEL INSTALLATION NOTES:

1. PUMP MOTOR CONDUIT SHALL BE SIZE TO ACCOMODATE 40% CONDUIT FILL. MINIMUM CONDUIT SIZE TO BE 2" SCH 80 PVC.
2. POWER SUPPLY SHALL BE UNDERGROUND ON THE LIFT STATION SITE AND SHALL BE 3-PHASE, FROM A 3-PHASE SOURCE ONLY.
3. AN ELECTRICAL GROUNDING SYSTEM SHALL BE INSTALLED AS PER THE NATIONAL ELECTRICAL CODE, LOCAL CODES AND ORDINANCES. AN UNDERGROUND PERIMETER CABLE GROUNDING SYSTEM SHALL BE INSTALLED WITH CONNECTIONS TO AT LEAST WET WELL COVER, VALVE VAULT COVER, CONTROL PANELS, GENERATOR, UTILITY COMPANY TRANSFORMER, MANUAL DISCONNECT SWITCH, AND METAL FENCE. REFER TO GROUNDING DETAILS.
4. THE STATION NAME, UTILITIES ID NUMBER, AND ADDRESS SHALL BE AFFIXED TO THE FRONT OF THE METER CABINET.
5. ALL MOUNTING HARDWARE AND BRACKETS SHALL BE 316 STAINLESS STEEL.
6. ON A 4-WIRE, DELTA SYSTEM, THE HIGH-LEG SHALL BE IDENTIFIED WITH ORANGE COLOR TAPE AT ALL CONNECTION POINTS AND SHALL BE LOCATED ON THE "B" PHASE AT THE LINE SIDE OF THE MAIN DISCONNECT.
7. THE SCADA PANEL IS TO SHOWN FOR INFORMATION ONLY AND WILL BE INSTALLED IN THE FUTURE (BY OTHERS).



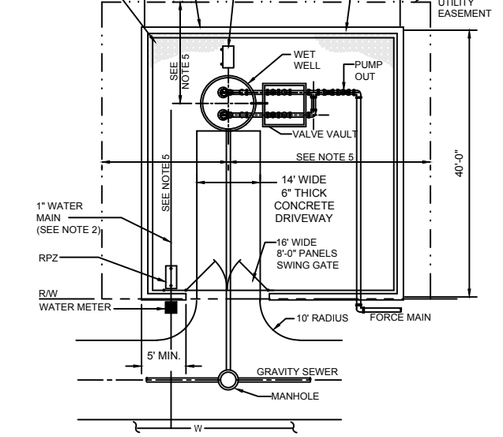
PANEL INSTALLATION NOTES:

1. PUMP MOTOR CONDUIT SHALL BE SIZE TO ACCOMODATE 40% CONDUIT FILL. MINIMUM CONDUIT SIZE TO BE 2" SCH 80 PVC.
2. POWER SUPPLY SHALL BE UNDERGROUND ON THE LIFT STATION SITE AND SHALL BE 3-PHASE, FROM A 3-PHASE SOURCE ONLY.
3. AN ELETRICAL GROUNDING SYSTEM SHALL BE INSTALLED AS PER THE NATIONAL ELECTRICAL CODE, LOCAL CODES AND ORDINANCES, AN UNDERGOUND PERIMETER CABLE GROUNDING SYSTEM SHALL BE INSTALLED WITH CONNECTIONS TO AT LEAST WET WELL COVER, VALVE VAULT COVER, CONTROL PANELS, GENERATOR, UTILITY COMPANY TRANSFORMER, MANUAL DISCONNECT SWITCH, AND METAL FENCE. SEE GROUNDING DETAILS.
4. THE STATION NAME, HOWEY IN THE HILLS I.D. NUMBER, AND ADDRESS SHALL BE AFFIXED TO THE FRONT OF THE METER CABINET.
5. ALL MOUNTING HARDWARE & BRACKETS SHALL BE 316 STAINLESS STEEL.
6. ON A 4-WIRE, DELTA SYSTEM, THE HIGH-LEG SHALL BE IDENTIFIED WITH ORANGE COLOR TAPE AT ALL CONNECTION POINTS AND SHALL BE LOCATED ON THE "B" PHASE AT THE LINE SIDE OF THE MAIN DISONNECT.
7. THE SCADA PANEL IS SHOWN FOR INFORMATION ONLY AND WILL BE INSTALLED IN THE FUTURE (BY OTHERS).



NOTES:

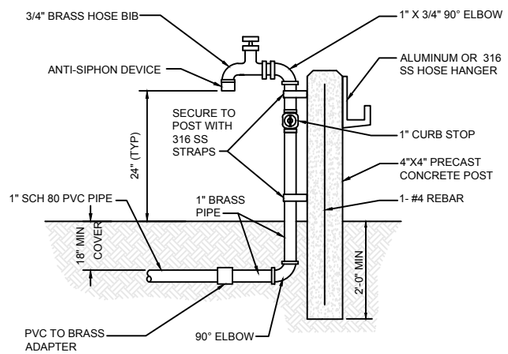
1. DEADFRONT LAYOUT NEMA TYPE 3R SS ENCLOSURE W/CONTINUOUS HINGE. ALL HARDWARE TYPE 316 SS TYPICAL, ACTUAL LAYOUT MAY VARY WITH HORSEPOWER.
2. THIS CONTROL PANEL, INCLUDING THE GENERATOR RECEPTACLE, COMPLIES WITH THE STANDARD LIST OF COMPONENTS REQUIRED BY UTILITIES.
3. ALL CONTROL WIRE TO BE #14 AWG MINIMUM.
4. CONTROL PANEL SHALL BE UL LISTED AND LABELED.
5. 30 SPARE TERMINALS (TB2).
6. PHASE MONITOR CIRCUIT BREAKER TO BE SEIMENS P/N: MSP10G, OR SQ-D P/N: MG24532.



NOTES:

1. MINIMUM 20' ACCESS DRIVEWAY FROM EDGE OF PAVEMENT TO THE GATE SHALL BE PROVIDED ON NON-RESIDENTIAL ROADS.
2. WASHDOWN WATER SOURCE SHALL BE CONNECTED TO THE POTABLE WATER MAIN.
3. ENGINEER SHALL PROVIDE A SCALED (1" = 20' MIN.) SITE SPECIFIC DETAIL.
4. MINIMUM DISTANCE BETWEEN FENCE AND ALL INSTALLED EQUIPMENT SHALL BE 5'.
5. THIS DIMENSION SHALL BE AT LEAST EQUAL TO THE DEPTH OF THE WET WELL WHEN MEASURED FROM THE CENTER OF THE WET WELL.

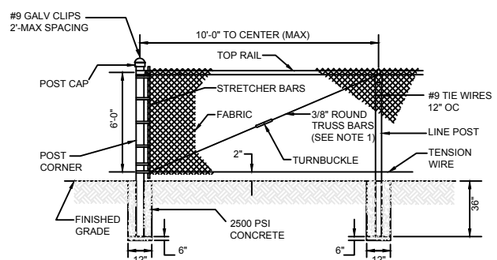
SITE PLAN



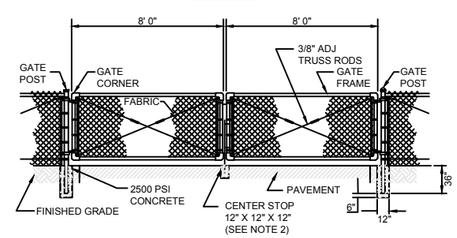
LIFT STATION POTABLE WATER SERVICE

LEGEND

AH	–	ALARM HORN
AL	–	ALARM LIGHT
ASB	–	ALARM SILENCE BUTTON
ATS	–	ALTERNATOR TEST SWITCH
CCB	–	CONTROL CIRCUIT BREAKER
DPDT	–	DOUBLE POLE DOUBLE THROW
DRB	–	DUPLEX RECEPTACLE BREAKER
ECB	–	EMERGENCY CIRCUIT BREAKER
ETM	–	ELAPSED TIME METER
F	–	FUSE
FB	–	FUSE BLOCK
FL	–	FLASHER
FR	–	FLOAT REGULATOR
GFDR	–	GROUND FAULT DUPLEX RECEPTACLE
GR	–	GENERATOR RECEPTACLE
HOA	–	HAND-OFF-AUTO SELECTOR SWITCH
MB	–	MOTOR BREAKER
MCB	–	MAIN CIRCUIT BREAKER
MS	–	MOTOR STARTER
OL	–	OVERLOAD
PL	–	PILOT LIGHT
PM	–	PHASE MONITOR
R	–	RELAY
RL	–	RUNNING LIGHT
SCB	–	SCADA CIRCUIT BREAKER
TB	–	TERMINAL BLOCK
TTS	–	THERMAL TERMINAL STRIP
TVSS	–	TRANSIENT VOLTAGE SURGE SUPPRESOR
XFMR	–	TRANSFORMER



FENCE DETAIL



DOUBLE SWING GATE DETAIL

NOTES:

1. TRUSS BARS ARE REQUIRED FOR EACH GATE SECTION AND THE FIRST SPAN ON EACH SIDE OF A CORNER POST ONLY.
2. PROVIDE CHAIN AND LOCK FOR SECURING GATE.
3. FENCING SHALL BE BLACK, VINYL CLAD.

DATE	REVISIONS
1 6-29-07	ADD ALARM HORN
2	
3	
4	
5	
6	
7	

BOOTH ERN STRAUGHAN HIOTT
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Tavares, Florida 32778
Office: 352.343.8481
Fax: 352.343.8496
www.beasndh.com
Certificate of Authorization Number: 27029

VENEZIA NORTH & SOUTH RESIDENTIAL SUBDIVISION LIFT STATION DETAILS

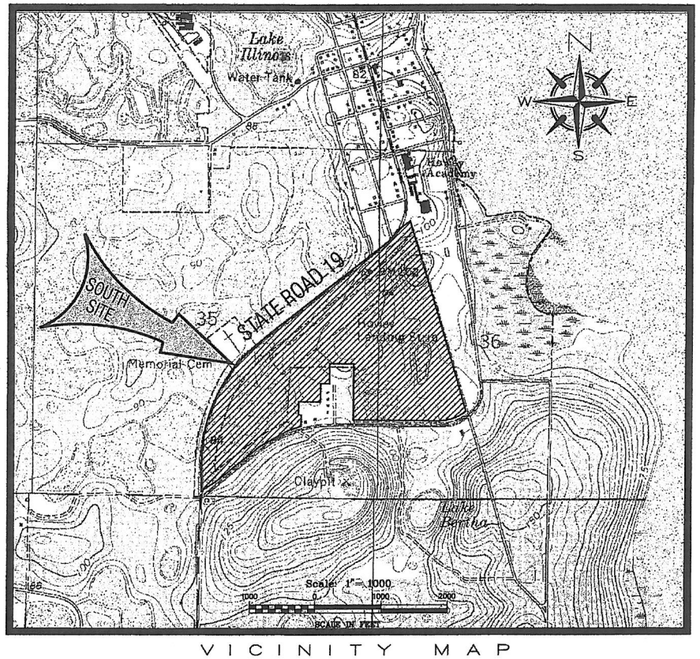
DESIGNED BY: CCH
PROJECT NO.: 05STR1000
DATE: MAY 2007
DRAWN/CHECKED BY: CTH
SHT. 48 OF 52

CHARLES C. HIOTT, P.E.
PROFESSIONAL ENGINEER 54813

CONSTRUCTION PLANS
FOR
Venezia South Subdivision

Section 35 & 36, Township 22 South, Range 25 East
Town of Howey in the Hills, Lake County, Florida

WAIVER REQUEST:
REQUEST WAIVER FOR LENGTH OF CUL - DE- SACs
TERRACOTTA TERRACE TO BE 1410' LF
CALABRIA WAY TO BE 1088' LF
INSTEAD OF THE REQUIRED 600' LF.



VICINITY MAP

SHEET INDEX

1. Cover Sheet
2. Aerial Overlay
3. Master Site Plan Sheet A
4. Master Site Plan Sheet B
5. Boundary & Topographic Survey
6. Boundary & Topographic Survey
7. Boundary & Topographic Survey
8. Land Use Summary Sheet A
9. Land Use Summary Sheet B
10. Utility Plan Sheet A
11. Utility Plan Sheet B
12. Grading Plan Sheet A
13. Grading Plan Sheet B
14. Intersection Details Sheet A
15. Intersection Details Sheet B
16. Erosion Control/S.W.P.P.P. Sheet A
17. Erosion Control/S.W.P.P.P. Sheet B
18. Drainage Plan Sheet A
19. Drainage Plan Sheet B
20. Venezia Boulevard (Sta. 100+00 to 113+50) Plan & Profile
21. Venezia Boulevard (Sta. 113+50 to 119+36.07) Plan & Profile
22. Bellissimo Place (Sta. 200+00 to 214+50) Plan & Profile
23. Bellissimo Place (Sta.214+50 to 226+50) Plan & Profile
24. Bellissimo Place (Sta. 226+50 to 232+21.41) Plan & Profile
25. Napoli Way Plan & Profile
26. Terracotta Terrace Plan & Profile
27. Messina Place (Sta. 500+00 to 510+00) Plan & Profile
28. Messina Place (Sta. 510+00 to 519+00) Plan & Profile
29. Calabria Way Plan & Profile
30. Tree Location Plan
31. Drainage Cross-Sections
32. Sanitary Sewer Details
33. Lift Station Details
34. Potable Water Details
35. Reclaimed Water Details
36. Paving & Drainage Details
37. General Project Details

FINAL SUBMITTED PLANS
DATE 12-05-07
INI. DWT
18971-3X
RECEIVED
JUN 29 2007
PDS
ALTAMONTE SVC. CTR.

* See Revised Sheets Revd 10-31-07
JUN 29 2007

OWNER:
FRED BENNETT
LYKES BROTHERS, INC.
400 NORTH TAMPA STREET
TAMPA, FLORIDA 33601
(813) 470-5509
(813) 470-5020 FAX

DEVELOPER:
FLAGSHIP HARB, LLC
916 HIGHLAND AVENUE
ORLANDO, FLORIDA 32803
(407) 246-1144
(407) 246-1155 FAX
CONTACT: TED BOLIN

ENGINEER:
BOOTH, ERN, STRAUGHAN & HIOTT, INC.
350 NORTH SINCLAIR AVENUE
TAVARES, FLORIDA-32778
(352) 343-8481
CONTACT: CHARLES HIOTT, P.E.

LEGAL DESCRIPTION:

SOUTH PARCEL
A PARCEL OF LAND BEING A PORTION OF "HOWIE-IN-THE-HILLS" (AN UNRECORDED PLAT) LYING IN SECTIONS 35 AND 36, TOWNSHIP 20 SOUTH, RANGE 25 EAST, LAKE COUNTY, FLORIDA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE SOUTHWEST CORNER OF THE NORTHEAST 1/4 OF THE NORTHEAST 1/4 OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 25 EAST, LAKE COUNTY, FLORIDA; THENCE ALONG THE WEST BOUNDARY OF THE SOUTHEAST 1/4 OF THE NORTHEAST 1/4 OF SAID SECTION 35 S00°02'16"W, A DISTANCE OF 1298.85 FEET TO A POINT OF INTERSECTION WITH THE SOUTHERLY RIGHT OF WAY LINE OF PALM AVENUE (STATE ROAD NO. 19) SAID POINT BEING THE POINT OF BEGINNING; THENCE ALONG SAID RIGHT OF WAY N51°23'37"E, A DISTANCE OF 1797.48 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF SAID CURVE 368.66 FEET, CONCAVE NORTHWESTERLY AND HAVING A RADIUS OF 785.56 FEET, A CENTRAL ANGLE OF 2°30'40" AND A CHORD BEARING AND DISTANCE OF N40°08'15"E, 306.68 FEET; THENCE DEPARTING SAID RIGHT OF WAY N32°52'15"E, A DISTANCE OF 248.38 FEET; THENCE N72°56'00"E, A DISTANCE OF 7.90 FEET; THENCE S17°04'25"E, A DISTANCE OF 2998.56 FEET TO A POINT OF INTERSECTION WITH THE NORTHERLY RIGHT OF WAY LINE OF COUNTY ROAD, (A.K.A. REVELS ROAD), SAID POINT BEING A POINT OF CURVATURE; THENCE ALONG SAID RIGHT OF WAY AND THE ARC OF SAID CURVE 443.81 FEET, CONCAVE NORTHERLY, HAVING A RADIUS OF 610.22 FEET, A CENTRAL ANGLE OF 41°40'17" AND A CHORD BEARING AND DISTANCE OF S85°14'52"W, 434.10 FEET TO A POINT OF TANGENCY; THENCE S68°45'55"W, A DISTANCE OF 1297.88 FEET; THENCE DEPART SAID RIGHT OF WAY N00°12'13"W, A DISTANCE OF 848.49 FEET; THENCE S89°48'55"W, A DISTANCE OF 360.14 FEET; THENCE S00°07'36"E, A DISTANCE OF 305.15 FEET; THENCE S89°56'08"W, A DISTANCE OF 135.00 FEET; THENCE S00°09'07"E, A DISTANCE OF 275.35 FEET; THENCE S89°48'03"W, A DISTANCE OF 328.16 FEET; THENCE S00°37'45"W, A DISTANCE OF 200.21 FEET; THENCE N89°47'35"E, A DISTANCE OF 45.00 FEET; THENCE S00°12'22"W, A DISTANCE OF 168.45 FEET TO A POINT OF INTERSECTION WITH THE NORTHERLY RIGHT OF WAY LINE OF SAID COUNTY ROAD, SAID POINT BEING A POINT ON A CURVE; THENCE ALONG SAID RIGHT OF WAY AND THE ARC OF SAID CURVE 189.84 FEET, CONCAVE SOUTHERLY, HAVING A RADIUS OF 3270.82 FEET, A CENTRAL ANGLE OF 3°19'41" AND A CHORD BEARING AND DISTANCE OF S71°20'23"W, 189.81 FEET; THENCE DEPART SAID RIGHT OF WAY LINE S60°21'53"W, A DISTANCE OF 531.95 FEET; THENCE S51°11'36"W, A DISTANCE OF 795.55 FEET; THENCE S55°02'40"W, A DISTANCE OF 320.80 FEET TO THE EASTERLY RIGHT OF WAY LINE OF STATE ROAD NO. 19, SAID RIGHT OF WAY BEING COMPRISED IN PART BY PORTIONS OF MARIE AVENUE AND PALM AVENUE; THENCE ALONG SAID RIGHT OF WAY N00°09'53"W, A DISTANCE OF 468.11 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF SAID CURVE 2017.34 FEET, CONCAVE SOUTHEASTERLY, HAVING A RADIUS OF 2241.83 FEET, A CENTRAL ANGLE OF 51°33'39" AND A CHORD BEARING AND DISTANCE OF N25°39'52"E, 1949.98 FEET TO A POINT OF TANGENCY; THENCE N51°23'2"E, A DISTANCE OF 601.65 FEET TO THE POINT OF BEGINNING.

THENCE S89°50'24"W, A DISTANCE OF 232.87 FEET TO THE POINT OF BEGINNING.

STATE OF FLORIDA CERTIFICATION OF AUTHORIZATION NO. 27029

S:\(00)LAKE\051373.000 LYKES BROTHERS\Improvement plans\covers-details\SJRWD\south\01 south-cover.dwg, 06/28/2007 11:18:41 AM, lori

UTILITY CONSTRUCTION NOTES (DEP)

62-555.314 Location of Public Water System Mains: For the purpose of this section, the phrase "Water Mains" shall mean Mains, including Treatment Plant process piping, conveying either raw, partially treated, or finished drinking water; fire hydrantleads; and service lines that are under the control of a Public Water System and that have an inside diameter of three (3") inches or greater.
(1) Horizontal Separation Between Underground Water Mains and Sanitary or Storm Sewers, Wastewater or Storm water Force Mains, Reclaimed Water Pipelines, and On-site Sewage Treatment and Disposal Systems:
(a) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (3) Three feet between the outside of the WATER MAIN and the outside of any existing or proposed Storm Sewer, Storm water Force Main, or pipeline conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
(b) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (3) three feet, and preferably (10) Ten Feet, between the outside of the WATER MAIN and the outside of any existing or proposed vacuum-type Sanitary Sewer.
(c) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (6) Six Feet, and preferably (10) Ten Feet, between the outside of the WATER MAIN and the outside of any existing or proposed Gravity- or Pressure-type Sanitary Sewer, Wastewater Force Main, or pipeline conveying reclaimed water not regulated under Part III of Chapter 62-610 F.A.C. The Minimum Horizontal Separation distance between WATER MAINS and Gravity-type Sanitary Sewers shall be reduced to (3) Three Feet where the BOTTOM of the WATER MAIN is laid at least (6) Six Inches above the Top of the Sewer.
(d) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (10) Ten Feet between the outside of the WATER MAIN and all parts of any existing or proposed "On site Sewage Treatment and Disposal System" as defined in Section 381.0065(2), F.S. and Rule 64E-6.002, F.A.C.
(2) Vertical Separation Between Underground WATER MAINS and Sanitary or Storm Sewers, Wastewater or Storm water Force Mains, and Reclaimed Water Pipelines:
(a) New or relocated underground WATER MAINS crossing any existing or proposed gravity-or vacuum-type sanitary sewer or storm sewer shall be laid so the outside of the WATER MAIN is at least (6) Six inches, and preferably 12 inches above, or at least 12 inches below the outside of the other pipeline. However, it is preferable to lay the WATER MAIN "ABOVE" the other pipeline.
(b) New or relocated, underground WATER MAINS crossing any existing or proposed pressure-type sanitary sewer, wastewater or stormwater Force Main, or Pipeline conveying reclaimed water shall be laid so the outside of the WATER MAIN is at least (12) Inches ABOVE or BELOW the Outside of the other pipeline. However, it is preferable to lay the WATER MAIN above the other pipeline.
(c) At the Utility crossings described in paragraphs (a) & (b) Above, one full length of Water Main Pipe shall be centered above or below the other pipeline so the WATER MAIN joints will be as far as possible from the other pipeline. Alternatively, at such crossings, the pipes shall be arranged so that all WATER MAIN Joints are at least (3) Three feet from all joints in Vacuum-type Sanitary Sewers, Storm Sewers, Stormwater Force Mains, or pipelines conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C., and at least (6) Six Feet from all Joints in Gravity- or Pressure-type Sanitary Sewers, Wastewater force mains, or pipelines conveying reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.
(3) Separation Between WATER MAINS and Sanitary or Storm Sewer Manholes:
(a) No WATER MAIN shall pass thru, or come into contact with any part of a Sanitary Manhole or a Storm Sewer Manhole.
(4) Separation Between Fire Hydrant Drains and Sanitary or Storm Sewers, Wastewater or Stormwater Force Mains, reclaimed Water Pipelines, and On-Site Sewage Treatment and Disposal Systems. New or relocated Fire Hydrants with underground Drains shall be located so that the drains are at least (3) Three Feet from any existing or proposed storm sewer, Stormwater force main, or pipeline conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C.; at least (3) Three Feet, and preferably (10) Ten Feet, from any existing or proposed gravity- or Pressure-type Sanitary Sewer, Wastewater force main, or pipeline conveying reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.; and at least (10) Ten Feet from any existing or proposed "on-site sewage treatment and disposal system" as defined in Section 381.0065(2), F.S. and Rule 64E-6.002, F.A.C.
(5) Exceptions/Mitigation: Adherence to the above Constraints and Separations in Items 1 through 4 shall be Complied to, "WITHOUT EXCEPTION". If for some reason which it is not technically feasible or Economically Savable that Items 1 through 4 cannot be complied with, Contractor will Stop Work and Notify the Engineer of record for the appropriate solution, which will be submitted to 'The Department of Environmental Protection' for APPROVAL, prior to Work commencement.

COLOR CODING

All water main pipe, including fittings, installed on or after August 26, 2003, except pipe installed under a construction permit for which the Department received complete application before August 26, 2003, shall be color coded or marked using blue as a predominate color to differentiate drinking water from reclaimed or other water. Under-ground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall; and underground metal or concrete pipe shall have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90° intervals around the pipe, and will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Aboveground pipe as drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555.320(19),F.A.C., and all other aboveground pipe shall be painted blue or shall be color coded or marked like underground pipe.

GENERAL WATER NOTES

1. Water system components shall be installed in strict accordance with all local codes and regulations, cleaned, disinfected and bacteriologically cleared for service in accordance with the latest AWWA Standards and Chapter 62-555 Florida Administrative Code.
2. All piping shall bear the "NSF" seal for Potable Water.
3. Water mains shall be PVC conforming to AWWA C-900, DR 18 for pipe sizes 4"-12". Pipes 14" or larger shall be AWWA C-905, DR 18. All couplings, cleaning compounds, solvents, lubricants, and pipe preparation, for laying, shall be in accordance with the pipe manufacturers latest recommendations.
4. Depth of water lines to be 36" minimum cover from finish grade.
5. Water mains to be located 6.00' from back of curb or edge of pavement unless otherwise noted.
6. All sleeves under pavement shall extend 5' beyond the back of curb.
7. Disinfecting: Following the pressure testing, the Contractor shall disinfect all sections of the water distribution system. Disinfection shall be in accordance with the applicable provisions of AWWA Standard C651 "Disinfecting Water Mains", and all appropriate agency approval.
8. All Hydrostatic Tests shall be in accordance with AWWA C600 for Ductile Iron Pipe and C605/A23 for PVC pipe.
9. All water mains shall be installed, pressure and leak tested in accordance with AWWA C600, (62-555.320(21)(b) AND 62-555.330, F.A.C. All installation, testing and field procedures must be provided and must confirm to the applicable AWWA Standards.
10. All piping materials and specifications covering pipes, joints and packing materials, internal coating and linings, fittings, specials and appurtenances shall all be in accordance with the corresponding AWWA Standards and be conforming to NSF requirements, as may be applicable, with exceptions allowed only if documentation and assurances are provided in compliance with Paragraphs 62-555.320(5) (d) 62-655.320 (5) (b), and 62-555.320 (21) (b), F.A.C. The Lead Use Prohibition in Rule 62-550.320, F.A.C. shall also apply. Polyethylene tubing shall be per AWWA C901. Underground service lines and valves shall be per AWWA C800.
11. All existing wells on site to be abandoned in accordance with all applicable FDEP and SJRWMD requirements.

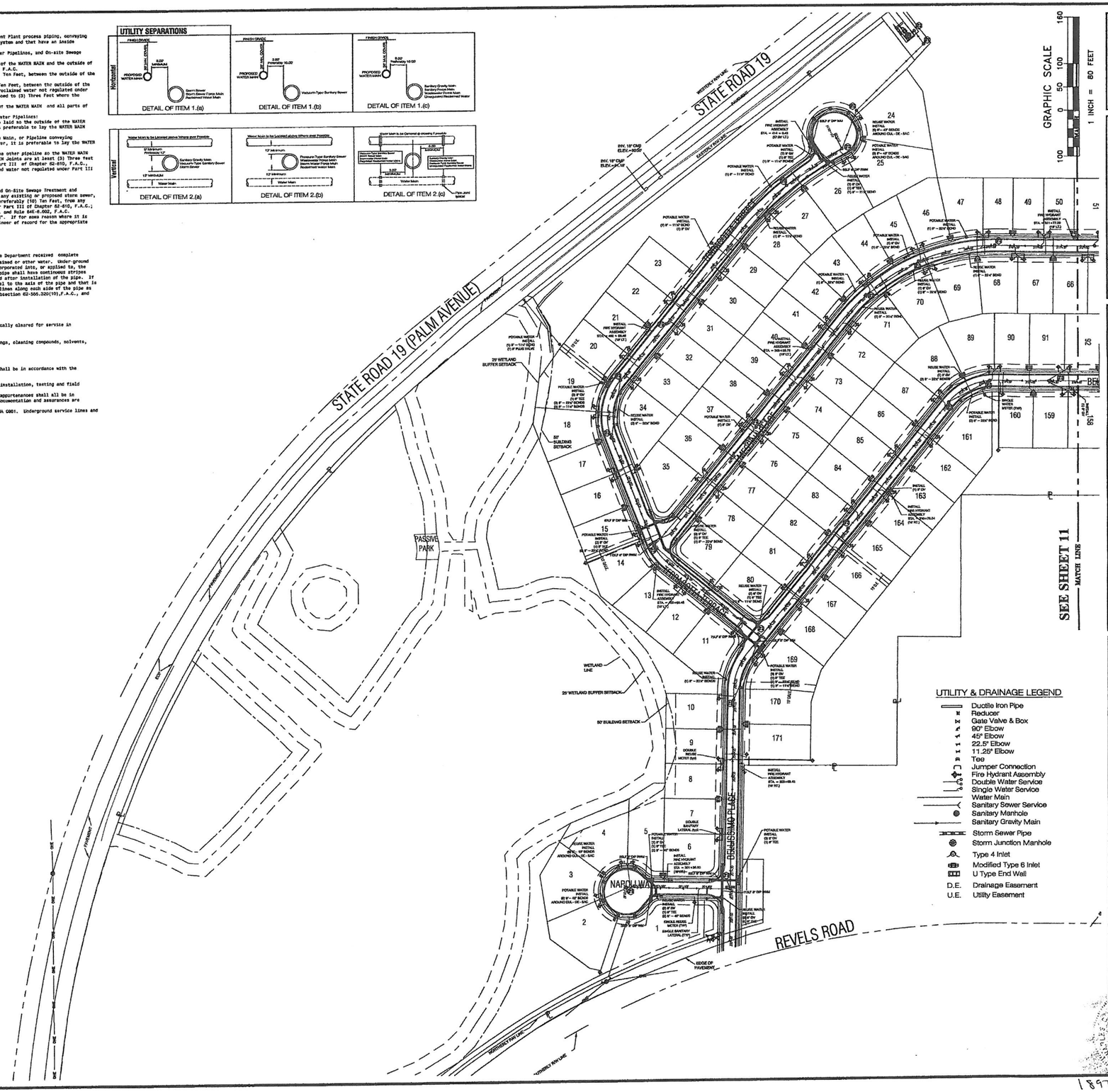
SANITARY PIPE CHART

MANHOLE ID	STATION	RIM	INV	TO	INV	PIPE	LENGTH	SLOPE
LS1 MH #22	215+43.02	101.05	97.05	MH #21	96.07	8" SDR-35	128LF	0.76%
LS1 MH #21	214+13.12	100.07	95.97	MH #20	94.54	8" SDR-35	99LF	1.44%
LS1 MH #20	213+10.52	98.54	94.44	MH #19	85.64	8" SDR-35	344LF	2.26%
LS1 MH #19	209+84.65	90.66	85.54	MH #15	84.35	8" SDR-35	298LF	0.40%
LS1 MH #18	302+22.76	87.32	83.32	MH #17	81.64	8" SDR-35	220LF	0.76%
LS1 MH #17	201+11.80 300+00.00	85.64	81.54	MH #16	79.94	8" SDR-35	400LF	0.40%
LS1 MH #16	205+14.51	92.64	79.84	MH #15	79.27	8" SDR-35	143LF	0.40%
LS1 MH #15	208+84.40 400+00.00	93.88	79.17	MH #9	77.98	8" SDR-35	298LF	0.40%
LS1 MH #14	512+22.76	100.83	96.73	MH #13	85.42	8" SDR-35	212LF	0.62%
LS1 MH #13	510+08.06	89.42	95.32	MH #12	93.68	6" SDR-35	168LF	0.99%
LS1 MH #12	508+38.82	97.68	93.58	MH #11	92.30	8" SDR-35	132LF	0.97%
LS1 MH #11	507+04.47	96.30	92.20	MH #10	88.49	8" SDR-35	388LF	1.01%
LS1 MH #10	503+34.27	92.49	88.39	MH #8	78.96	8" SDR-35	331LF	2.84%
LS1 MH #9	405+01.75	89.07	77.88	MH #6	76.89	8" SDR-35	247LF	0.40%
LS1 MH #8	405+50.78	90.69	76.79	MH #7	76.30	8" SDR-35	123LF	0.40%
LS1 MH #7	406+62.39	91.02	76.20	MH #6	75.59	8" SDR-35	153LF	0.40%
LS1 MH #6	408+37.89	89.85	75.49	MH #5	73.93	8" SDR-35	390LF	0.40%
LS1 MH #5	412+30.40	90.18	73.83	MH #4	73.27	8" SDR-35	140LF	0.40%
LS1 MH #4	413+74.13	88.35	73.17	MH #3	72.83	8" SDR-35	86LF	0.40%
LS1 MH #3	----	xx	72.73	MH #2	71.92	8" SDR-35	202LF	0.40%
LS1 MH #2	----	xx	71.82	MH #1	71.69	8" SDR-35	34LF	0.40%
LS1 MH #1	----	xx	71.58	LS	71.54	8" SDR-35	11LF	0.40%

MANHOLE ID	STATION	RIM	INV	TO	INV	PIPE	LENGTH	SLOPE
LS2 MH #28	234+30.58	83.39	78.39	MH #25	77.51	8" SDR-35	221LF	0.40%
LS2 MH #25	232+17.65	82.42	75.57	MH #24	74.48	8" SDR-35	278LF	0.40%
LS2 MH #24	229+35.28	83.47	74.36	MH #19	73.34	8" SDR-35	255LF	0.40%
LS2 MH #23	610+77.23	85.89	81.89	MH #22	81.23	8" SDR-35	168LF	0.40%
LS2 MH #22	609+07.66	87.77	81.13	MH #21	79.88	8" SDR-35	313LF	0.40%
LS2 MH #21	605+90.45	89.31	79.78	MH #20	78.59	8" SDR-35	298LF	0.40%
LS2 MH #20	602+68.20	86.92	78.49	MH #19	77.35	8" SDR-35	285LF	0.40%
LS2 MH #19	228+74.97 600+00.00	83.80	73.24	MH #13	72.57	8" SDR-35	168LF	0.40%
LS2 MH #18	217+40.71	100.61	96.51	MH #17	95.20	8" SDR-35	104LF	1.26%
LS2 MH #17	218+46.58	99.20	95.10	MH #16	93.59	8" SDR-35	85LF	1.78%
LS2 MH #16	219+36.42	97.59	93.49	MH #15	87.65	8" SDR-35	321LF	1.85%
LS2 MH #15	222+59.89	91.55	87.45	MH #14	86.08	8" SDR-35	76LF	1.80%
LS2 MH #14	223+38.77	90.06	85.98	MH #13	79.50	8" SDR-35	162LF	4.00%
LS2 MH #13	225+03.90 119+36.07	87.00	72.47	MH #12	70.90	8" SDR-35	393LF	0.40%
LS2 MH #12	115+40.97	94.00	70.80	MH #11	69.81	8" SDR-35	248LF	0.40%
LS2 MH #11	112+90.97	90.26	69.71	MH #8	68.69	8" SDR-35	240LF	0.40%
LS2 MH #10	513+73.47	100.16	96.16	MH #9	94.86	8" SDR-35	103LF	1.26%
LS2 MH #9	514+80.65	98.86	94.76	MH #8	80.00	8" SDR-35	390LF	4.01%
LS2 MH #8	518+48.67 110+40.68	91.39	88.59	MH #7	87.30	8" SDR-35	322LF	0.40%
LS2 MH #7	107+17.77	98.65	87.20	MH #6	86.28	8" SDR-35	231LF	0.40%
LS2 MH #6	104+86.40	100.38	86.18	MH #5	85.44	8" SDR-35	186LF	0.40%
LS2 MH #5	----	xx	85.34	MH #4	84.25	8" SDR-35	272LF	0.40%
LS2 MH #4	----	xx	84.15	MH #3	83.34	8" SDR-35	203LF	0.40%
LS2 MH #3	----	xx	83.24	MH #2	82.49	8" SDR-35	187LF	0.40%
LS2 MH #2	----	xx	82.39	LS	81.72	8" SDR-35	154LF	0.40%

GENERAL NOTES:
1. ALL PIPE LENGTHS ARE APPROXIMATE AND ROUNDED OFF TO THE NEAREST FOOT. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL MATERIAL LISTS PRIOR TO FINAL ORDERING.
2. ALL STRUCTURE INVERTS SHALL BE POURED AND SHAPED TO PROMOTE FLOW AND TO PREVENT STANDING WATER.
3. ALL CONSTRUCTION MATERIALS SHALL CONFORM TO THE LATEST TOWN OF HOWEY-IN-THE-HILLS STANDARDS AND SPECIFICATIONS.
4. ALL CONSTRUCTION SHALL BE SUBJECT TO INSPECTIONS AND APPROVALS BY THE PROJECT ENGINEER AND THE TOWN OF HOWEY-IN-THE-HILLS.

UTILITY SEPARATIONS



BOESCH EISENBERG & STEFANI, INC.
ENGINEERS • SURVEYORS • PLANNERS
350 North Florida Ave.
Bartow, Florida 33830
www.boesandis.com
Certificate of Authorization Number: 27029
Office: 352.243.2491
Fax: 352.243.5496

VENEZIA SOUTH
RESIDENTIAL SUBDIVISION
UTILITY PLAN
Sheet A

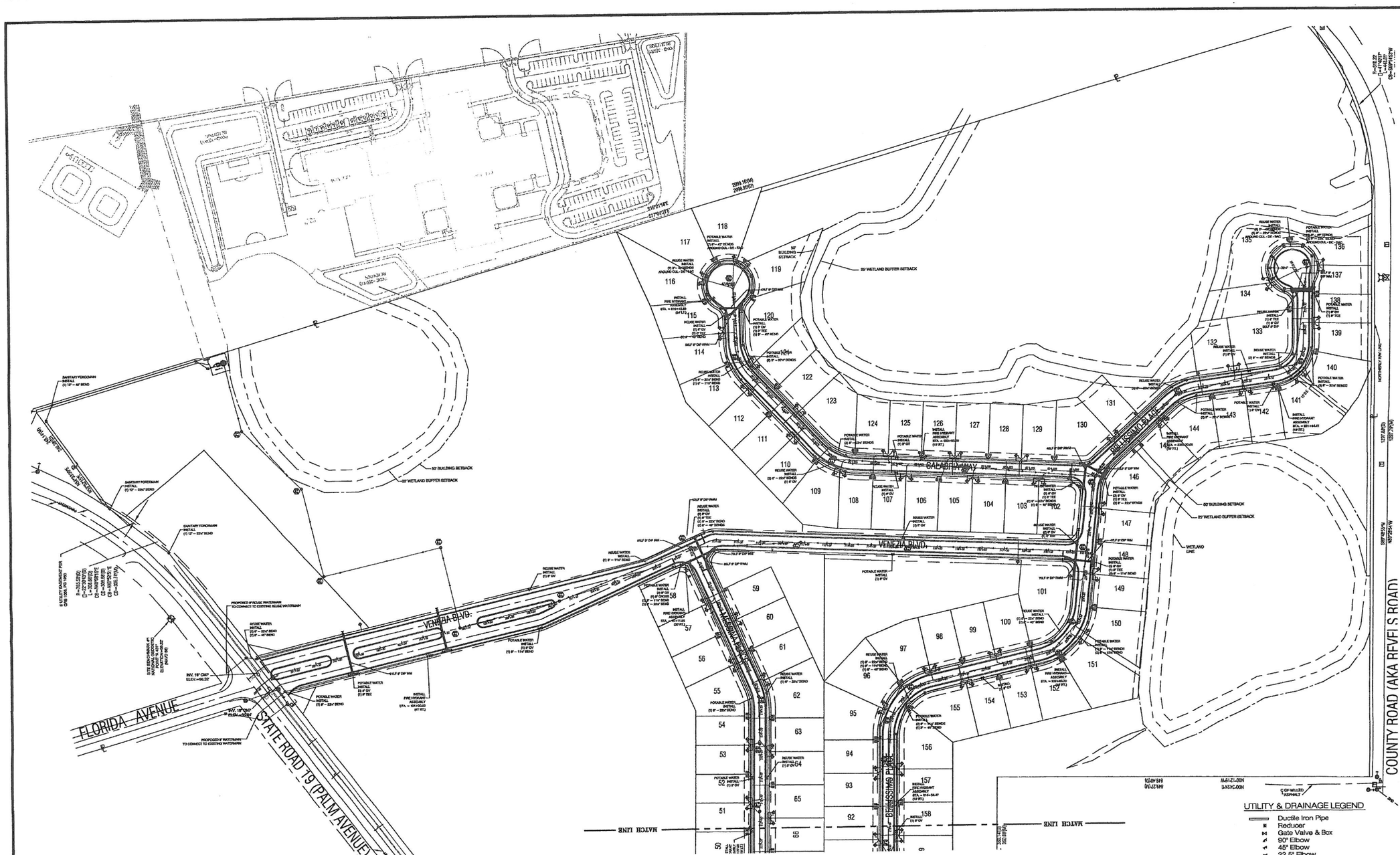
CHECKED BY: CCH
PROJECT NO.: 051373.0000
DATE: JUNE 2006
DESIGNED/DRAWN BY: LCS
SHT. 10 OF 37

JUN. 28 2007

CHARLES C. HOTT, P.E.
PROFESSIONAL ENGINEER 54815

18971-3

S:\(00)LAKE\051373.0000 LYKES BROTHERS\Improvement plans\SJRWMD sheets\South-sheets.dwg, 06/28/2007 07:42:29 PM, 1or1



SEE SHEET 10

UTILITY & DRAINAGE LEGEND

- Ductile Iron Pipe
- Reducer
- Gate Valve & Box
- 90° Elbow
- 45° Elbow
- 22.5° Elbow
- 11.25° Elbow
- Tee
- Jumper Connection
- Fire Hydrant Assembly
- Double Water Service
- Single Water Service
- Water Main
- Sanitary Sewer Service
- Sanitary Manhole
- Sanitary Gravity Main
- Storm Sewer Pipe
- Storm Junction Manhole
- Type 4 Inlet
- Modified Type 6 Inlet
- U Type End Wall
- D.E. Drainage Easement
- U.E. Utility Easement

GRAPHIC SCALE

100 0 50 100 200

1 INCH = 100 FEET

N

DATE	REVISIONS
1	
2	
3	
4	
5	
6	
7	

BOTH EN STRAUSHAN HOTT
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Tavares, Florida 32778
www.bessandh.com
Office: 352.343.8481
Fax: 352.343.8495
Certificate of Authorization Number: 27029

VENEZIA SOUTH RESIDENTIAL SUBDIVISION

UTILITY PLAN

Sheet B

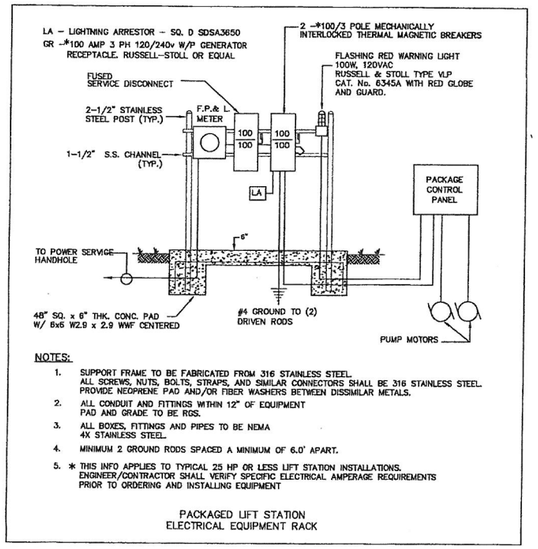
CHECKED BY: CCH
PROJECT NO.: 051373.0000
DATE: JUNE 2006
DESIGNED/DRAWN BY: LCS
SHT. 11 OF 37

JUN 2 4 2007

CHARLES C. HIOTT, P.E.
PROFESSIONAL ENGINEER 54813

18971-3

S:\(OD)LAKE\051373.0000 LYKES BROTHERS\improvement plans\SJRWMD sheets\South-sheets.dwg, 06/28/2007 07:43:28 PM, lorl



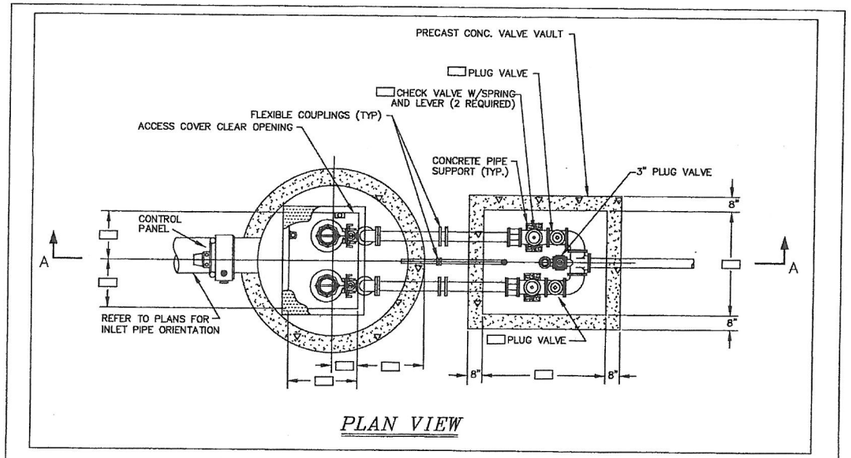
NOTES:

1. SUPPORT FRAME TO BE FABRICATED FROM 316 STAINLESS STEEL. ALL SCREWS, NUTS, BOLTS, STRAPS, AND SIMILAR CONNECTORS SHALL BE 316 STAINLESS STEEL. PROVIDE NEOPRENE PAD AND/OR FIBER WASHERS BETWEEN DISSIMILAR METALS.
2. ALL CONDUIT AND FITTINGS WITHIN 12" OF EQUIPMENT PAD AND GRADE TO BE RSS.
3. ALL BOXES, FITTINGS AND PIPES TO BE NEMA 4X STAINLESS STEEL.
4. MINIMUM 2 GROUND RODS SPACED A MINIMUM OF 6.0' APART.
5. * THIS INFO APPLIES TO TYPICAL 25 HP OR LESS LIFT STATION INSTALLATIONS. ENGINEER/CONTRACTOR SHALL VERIFY SPECIFIC ELECTRICAL AMPERAGE REQUIREMENTS PRIOR TO ORDERING AND INSTALLING EQUIPMENT

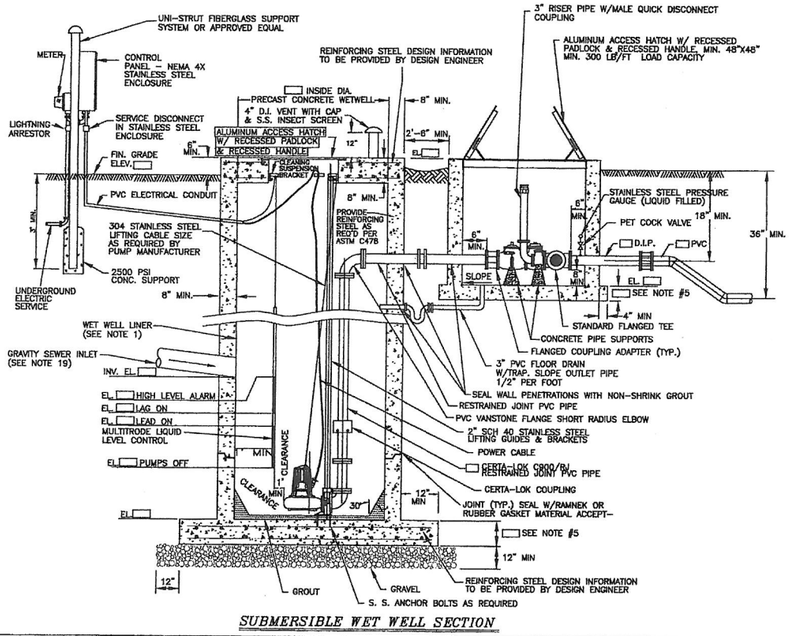
PACKAGED LIFT STATION
ELECTRICAL EQUIPMENT RACK

GENERAL NOTES SUBMERSIBLE PUMP STATION:

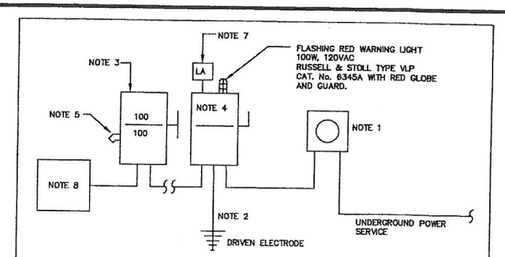
1. WET WELL SHALL BE LINED WITH "AGRU SURE GRIP" CONCRETE PROTECTIVE LINER OR APPROVED EQUAL. WET WELL EXTERIOR SHALL BE COATED WITH COAL TAR EPOXY.
2. BASE AND FIRST RISER UNIT TO BE CAST MONOLITHIC.
3. VALVE VAULT AND ACCESS COVERS SHALL BE SIZED TO PERMIT EASY REMOVAL OF CHECK VALVE.
4. VALVE VAULT SHALL HAVE SEALED FLOOR W/DRAIN TO WET WELL – TRAP REQUIRED.
5. ALL LOCATIONS WHERE PIPES ENTER OR LEAVE THE WET WELL OR VALVE VAULT SHALL BE MADE WATERTIGHT WITH WALL SLEEVE OR NON–SHRINK GROUT.
6. PUMP LIFTING DEVICE SHALL BE 304 SS LIFTING CABLE.
7. THERE SHALL BE NO ELECTRICAL JUNCTION BOXES IN WET WELL OR VALVE VAULT.
8. CHECK VALVES SHALL BE OUTSIDE WEIGHT & LEVER.
9. WET WELL & VALVE VAULT COVERS SHALL BE ALUMINUM WITH 304S.S HARDWARE, AS RECOMMENDED AND REQUIRED BY PUMP MANUFACTURER (LOADING 300 P.S.F.) AND PROVIDED WITH RECESSED LOCKS.
10. CONTROL PANEL SHALL BE AS MANUFACTURED BY THE PUMP SUPPLIER OR APPROVED EQUAL.
11. WET WELL DIAMETER SHALL BE 6' NOMINAL.
12. ACCESS HATCH DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE PUMPING EQUIPMENT, PIPING AND CONCRETE STRUCTURES TO ENSURE ADEQUATE ACCESS OPENINGS FOR INSTALLATION, OPERATION AND MAINTENANCE OF ALL EQUIPMENT.
13. FURNISH AND INSTALL GENERATOR RECEPTACLE
14. VALVE VAULT AND WET WELLS SHALL BE PRECAST CONCRETE. SUBMIT SHOP DRAWINGS WITH REINFORCING DETAILS FOR APPROVAL PRIOR TO FABRICATION.
15. CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
    A) POSTS SHALL BE SCHEDULE 40, GALVANIZED STEEL (2" OUTSIDE DIAMETER MIN.), MAXIMUM 10 FOOT SPACING
    B) FABRIC FOR FENCING AND GATES SHALL BE 9 GAUGE 2" MESH, CLASS 1, CONFORMING TO A.S.T.M. A–3920, 1.2 OZ. GALVANIZED COATING.
    C) POSTS SHALL BE SET IN 2500 PSI CONCRETE IN AN 8" DIAMETER HOLE WITH A DEPTH OF 36 INCHES.
    D) FENCING SHALL BE SCREENED WITH PVC SLATS, FEATHERLOCK OR APPROVED EQUAL. COLOR SHALL BE GREEN OR BLACK.
16. AUXILIARY POWER CONNECTION:
    A) FOR PUMPS < 10HP – RUSSELL & STOLL CAT. NO. FCF 3134–W–72, 100 AMP, 230 VOLT OR APPROVED EQUAL
    B) FOR PUMPS ≥ 10HP – RUSSELL & STOLL CAT. NO. FCF 3134–W–72, 200 AMP, 230 VOLT AR2042 – CROUSE–HINDS, OR APPROVED EQUAL
17. • HAND – (ON–OFF) – AUTOMATIC SWITCHES ON ALL PUMPS.
    • MANUAL – (ON–OFF) – SWITCH ON ALL ALTERNATORS.
    • ONE ELAPSED TIME METER FOR EACH PUMP.
    • 120 VOLT RECEPTACLE INSIDE CONTROL BOX.
    • 3 PHASE CURRENT (WILL NOT ACCEPT ADD A PHASE OR CAPACITOR PHASE CHANGERS).
    • POWER CABLE TO PUMPS RUN IN CONDUIT SEPARATE FROM FLOAT SWITCH CONDUIT.
    • LIQUID FILLED PRESSURE GAUGE ON FORCE MAIN.
18. FLOAT SWITCHES, MUST BE TRANSFORMER ISOLATED–24 VOLT MAX. ALL CONNECTIONS MUST TERMINATE IN CONTROL PANEL OUTSIDE OF WET WELL.
19. KNIFE SWITCH DISCONNECT BETWEEN POWER SUPPLY AND LIFT STATION CONTROL PANEL.
20. SHAKESPEARE FIBERGLASS LIGHT POLE CATALOG #8520 OR #8524 OR APPROVED EQUAL.
21. RUDD LIGHT 250W #FS3425–M OR APPROVED EQUAL.
22. SEAL GRAVITY PIPE AT WETWELL WITH RUBBER BOOT SEAL.
23. PUMP CONTROLLERS SHALL BE MULTI–TRODE MODEL MTPC CONTROLLER AND MTTS–5 SUPPRESSOR.



PLAN VIEW



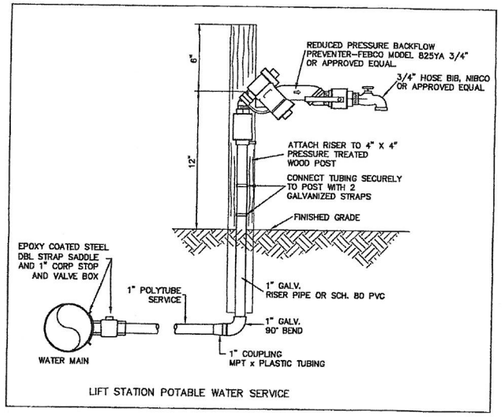
SUBMERSIBLE WET WELL SECTION



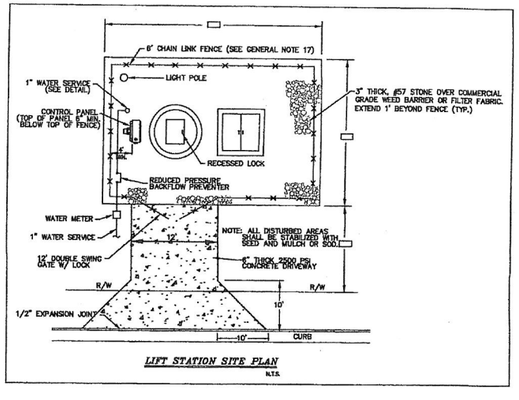
NOTES:

1. ALL BOXES, INCLUDING SWITCH GEAR, ELECTRIC METER CANS, DISCONNECT, AND ALL MISC. ELECTRICAL BOXES SHALL BE NEMA 4X STAINLESS STEEL. ALL BRACKETS, PIPING, BOLTS, NUTS, WASHERS, AND ANY FASTENERS SHALL BE 316 SS.
2. METER WITH BYPASS.
3. SERVICE GROUND TO INCLUDE 3 – 10' ELECTRODES ON 10' CENTERS BOND TO SLAB REBAR. USE #4 BARE COPPER MIN.
4. 100 AMP 3–POLE, CIRCUIT BREAKER MANUAL TRANSFER SWITCH IN WEATHERPROOF ENCLOSURE.
5. 100 AMP 3 POLE S–N FUSED 240 VOLT WEATHERPROOF DISCONNECT.
6. GENERATOR RECEPTACLE, RUSSELL & STOLL.
7. PACKAGE PUMP STATION CONTROL PANEL.
8. LIGHTNING ARRESTOR – SQUARE D No. SDSA 3650.

PACKAGED LIFT STATION
ELECTRICAL SERVICE SCHEMATIC



LIFT STATION POTABLE WATER SERVICE



LIFT STATION SITE PLAN
N.T.S.

DATE	REVISIONS
1	
2	
3	
4	
5	
6	
7	

BOOTH, BEN, STRALEY, HOTT
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Tavares, Florida 32778
www.bsandh.com
Office: 352.343.8481
Fax: 352.343.8486
Certificate of Authorization Number: 27029

VENEZIA SOUTH RESIDENTIAL SUBDIVISION

LIFT STATION DETAILS

CHECKED BY:	CCH
PROJECT NO.:	051373.0000
DATE:	JUNE 2006
DRAWN BY:	LCS
DESIGNED BY:	LCS
SHT.	33 OF 37

JUN 19 2007

CHARLES C. HOTT, P.E.
PROFESSIONAL ENGINEER 54813

18971-3

J:\Projects\Venezia South\Engineering plans\Covers-details\LS\RMD\south\32 Lift Station Details.dwg, 06/28/2007 12:24:15 PM, lori

(2)

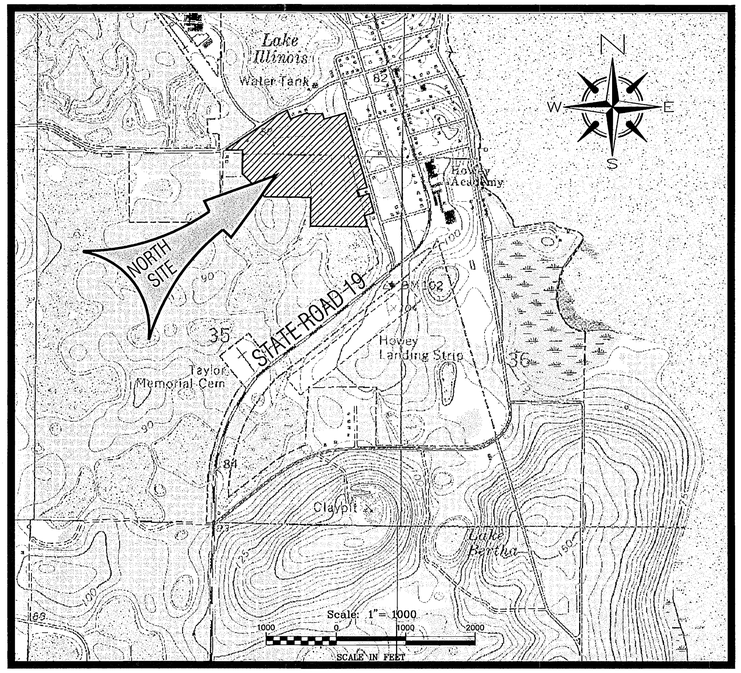
CONSTRUCTION PLANS
FOR
Venezia North Subdivision

Section 35 & 36, Township 22 South, Range 25 East
Town of Howey in the Hills, Lake County, Florida

OWNER:
FRED BENNETT
LYKES BROTHERS, INC.
400 NORTH TAMPA STREET
TAMPA, FLORIDA 33601
(813) 470-5509
(813) 470-5020 FAX

DEVELOPER:
FLAGSHIP HARB, LLC
916 HIGHLAND AVENUE
ORLANDO, FLORIDA 32803
(407) 246-1144
(407) 246-1155 FAX
CONTACT: TED BOLIN

ENGINEER:
BOOTH, ERN, STRAUGHAN & HIOTT, INC.
350 NORTH SINCLAIR AVENUE
TAVARES, FLORIDA-32778
(352) 343-8481
CONTACT: CHARLES HIOTT, P.E.



VICINITY MAP

SHEET INDEX

1. Cover Sheet
2. Aerial Overlay
3. Master Site Plan
4. Boundary & Topographic Survey
5. Land Use Summary
6. Utility Plan
7. Grading Plan
8. Intersection Details
9. Erosion Control/S.W.P.P.P.
10. Drainage Plan
11. Amola Way Plan & Profile
12. Avila Place Cul-de-Sac Plan & Profile
13. Avila Place (Sta. 30+00 to 42+50) Plan & Profile
14. Avila Place (Sta.42+50 to 56+50) Plan & Profile
15. Avila Place (Sta. 56+50 to 70+11.63) Plan & Profile
16. Drainage Cross-Sections
17. Sanitary Sewer Details
18. Lift Station Details
19. Potable Water Details
20. Reclaimed Water Details
21. Paving & Drainage Details
22. General Project Details

18971-2
RECEIVED
APR 13 2007
PDS
ALTAMONTE SVC. CTR.

LEGAL DESCRIPTION:

NORTH PARCEL
A PARCEL OF LAND BEING A PORTION OF "GROVE GARDENS" (PLAT BOOK 17, PAGE 2) AND "HOWIE-IN-THE-HILLS" (AN UNRECORDED PLAT) LYING IN SECTIONS 26 AND 35, TOWNSHIP 20 SOUTH, RANGE 25 EAST, LAKE COUNTY, FLORIDA AND MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE NORTHWEST CORNER OF THE NORTHEAST 1/4 OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 25 EAST, LAKE COUNTY, FLORIDA; THENCE ALONG THE NORTH BOUNDARY OF SAID SECTION N89°49'22"E, A DISTANCE OF 97.92 FEET TO THE POINT OF BEGINNING; THENCE DEPART SAID SECTION BOUNDARY N00°00'07"E, A DISTANCE OF 29.70 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF GRANT STREET; THENCE ALONG SAID RIGHT OF WAY N56°09'00"E, A DISTANCE OF 921.20 FEET; THENCE N64°54'03"E, A DISTANCE OF 134.15 FEET; THENCE DEPART SAID RIGHT OF WAY LINE S32°46'58"E, A DISTANCE OF 134.90 FEET; THENCE N67°23'40"E, A DISTANCE OF 249.96 FEET; THENCE S06°03'40"E, A DISTANCE OF 12.16 FEET; THENCE N89°52'29"E, A DISTANCE OF 222.15 FEET; THENCE S17°01'37"E, A DISTANCE OF 79.32 FEET; THENCE N72°54'16"E, A DISTANCE OF 315.08 FEET TO A POINT ON THE WEST RIGHT OF WAY LINE OF FLORIDA AVENUE; THENCE ALONG SAID RIGHT OF WAY S17°04'04"E, A DISTANCE OF 1132.61 FEET; THENCE DEPART SAID RIGHT OF WAY S72°57'38"W, A DISTANCE OF 149.84 FEET; THENCE S17°10'01"E, A DISTANCE OF 74.94 FEET; THENCE N72°58'13"E, A DISTANCE OF 149.82 FEET TO A POINT ON THE WEST RIGHT OF WAY LINE OF FLORIDA AVENUE; THENCE ALONG SAID RIGHT OF WAY S17°02'44"E, A DISTANCE OF 300.03 FEET; THENCE DEPART SAID RIGHT OF WAY S72°56'09"W, A DISTANCE OF 149.83 FEET; THENCE S17°02'42"E, A DISTANCE OF 164.96 FEET; THENCE N90°00'00"W, A DISTANCE OF 835.94 FEET TO A POINT ON THE WEST BOUNDARY OF THE NORTHEAST 1/4 OF THE NORTHEAST 1/4 OF SAID SECTION 35; THENCE ALONG SAID SECTION BOUNDARY N00°19'41"W, A DISTANCE OF 404.92 FEET; THENCE DEPARTING SAID SECTION BOUNDARY S89°51'12"W, A DISTANCE OF 609.75 FEET; THENCE N45°09'29"W, A DISTANCE OF 468.37 FEET; THENCE N00°06'38"W, A DISTANCE OF 331.44 FEET; THENCE S89°50'24"W, A DISTANCE OF 232.87 FEET TO THE POINT OF BEGINNING.

APR. 13 2007
CCH

STATE OF FLORIDA CERTIFICATION OF AUTHORIZATION NO. 27029

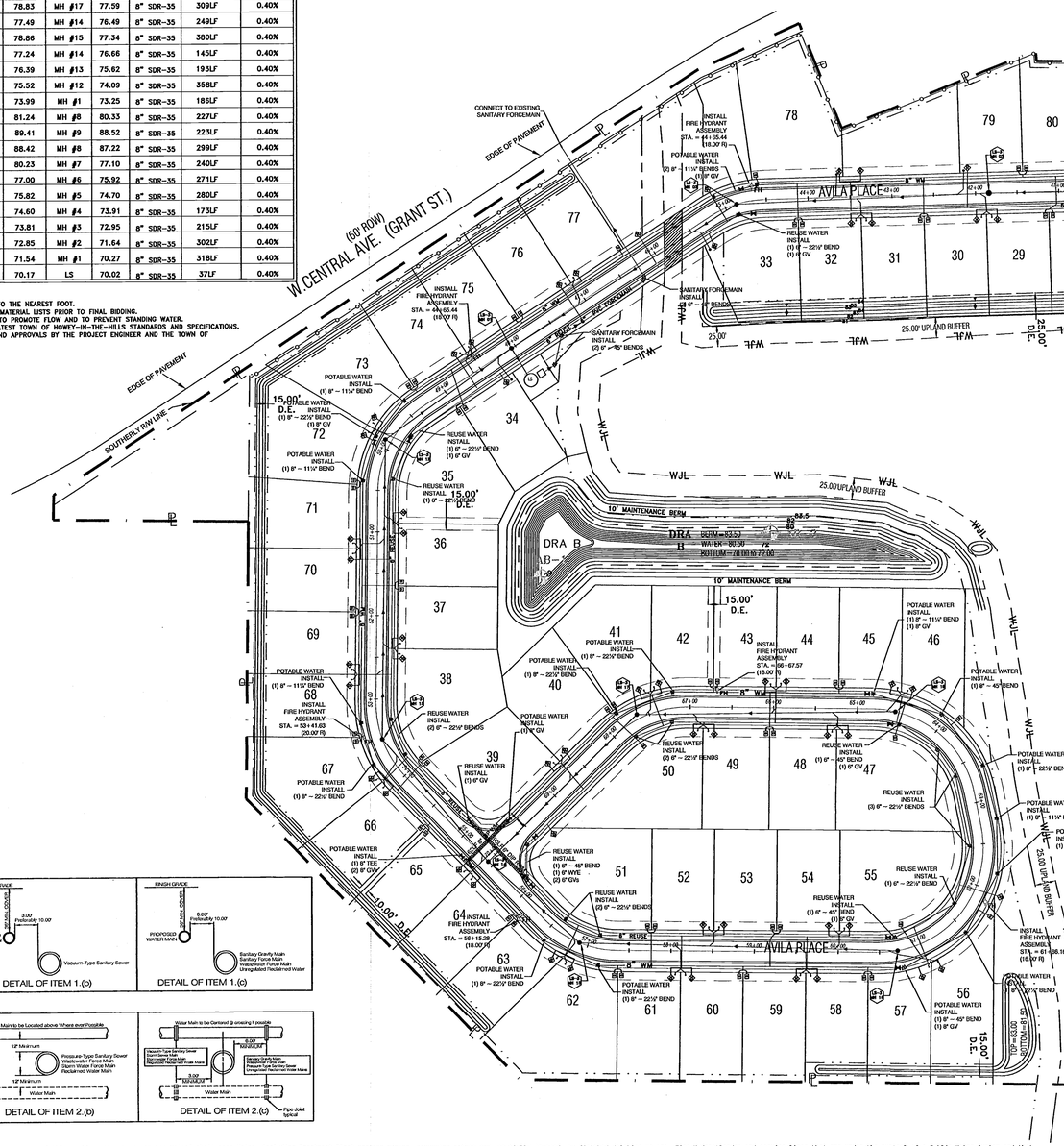
S:\100\LAKE\051373.0000 LYKES BROTHERS\improvement plans\covers-details\SJRNM\north\01 cover.dwg, 04/11/2007 09:18:01 AM, 1of

SANITARY PIPE CHART

MANHOLE ID	STATION	RIM	INV	TO	INV	PIPE	LENGTH	SLOPE
MH #18	64+54.35	84.68	78.83	MH #17	77.59	8" SDR-35	309LF	0.40%
MH #17	67+63.37	86.88	77.49	MH #14	76.49	8" SDR-35	249LF	0.40%
MH #16	60+71.72	85.09	78.86	MH #15	77.34	8" SDR-35	380LF	0.40%
MH #15	56+89.57	88.56	77.24	MH #14	76.66	8" SDR-35	145LF	0.40%
MH #14	55+42.88 70+11.63	89.47	76.39	MH #13	75.62	8" SDR-35	193LF	0.40%
MH #13	53+48.70	89.36	75.52	MH #12	74.09	8" SDR-35	358LF	0.40%
MH #12	49+90.52	86.02	73.99	MH #1	73.25	8" SDR-35	186LF	0.40%
MH #11	13+85.83	85.24	81.24	MH #8	80.33	8" SDR-35	227LF	0.40%
MH #10	25+29.01	93.29	89.41	MH #9	88.52	8" SDR-35	223LF	0.40%
MH #9	23+01.41	91.99	88.42	MH #8	87.22	8" SDR-35	299LF	0.40%
MH #8	11+57.71 20+00.00	95.00	80.23	MH #7	77.10	8" SDR-35	240LF	0.40%
MH #7	32+40.68	87.39	77.00	MH #6	75.92	8" SDR-35	271LF	0.40%
MH #6	35+12.71	87.45	75.82	MH #5	74.70	8" SDR-35	280LF	0.40%
MH #5	37+93.82	86.67	74.60	MH #4	73.91	8" SDR-35	173LF	0.40%
MH #4	39+67.93	84.92	73.81	MH #3	72.95	8" SDR-35	215LF	0.40%
MH #3	41+83.97	84.36	72.85	MH #2	71.64	8" SDR-35	302LF	0.40%
MH #2	44+86.36	87.35	71.54	MH #1	70.27	8" SDR-35	318LF	0.40%
MH #1	48+05.39	86.24	70.17	LS	70.02	8" SDR-35	37LF	0.40%

GENERAL NOTES:

1. ALL PIPE LENGTHS ARE APPROXIMATE AND ROUNDED OFF TO THE NEAREST FOOT. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL MATERIAL LISTS PRIOR TO FINAL BIDDING.
2. ALL STRUCTURE INVERTS SHALL BE POURED AND SHAPED TO PROMOTE FLOW AND TO PREVENT STANDING WATER.
3. ALL CONSTRUCTION MATERIALS SHALL CONFORM TO THE LATEST TOWN OF HOWEY-IN-THE-HILLS STANDARDS AND SPECIFICATIONS.
4. ALL CONSTRUCTION SHALL BE SUBJECT TO INSPECTIONS AND APPROVALS BY THE PROJECT ENGINEER AND THE TOWN OF HOWEY-IN-THE-HILLS.



UTILITY LEGEND

- Gate Valve & Box
- Pipe Elbow
- Tee
- FH — Fire Hydrant Assembly
- DS — Double Water Service
- SS — Single Water Service
- WM — Water Main
- DR — Double Re-use Water Service
- SR — Single Re-use Water Service
- RWM — Re-use Water Main
- Sanitary Sewer Service
- Sanitary Manhole
- Sanitary Gravity Main
- FORCEMAIN — Sanitary Force Main
- D.E. — Drainage Easement
- U.E. — Utility Easement

NOTE:
ALL UTILITY CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOWN OF HOWEY UTILITY CONSTRUCTION SPECIFICATIONS.

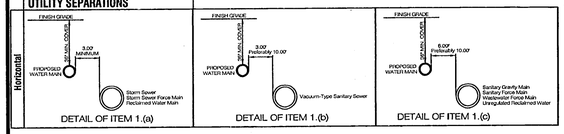
GRAPHIC SCALE
200 0 80 80
1 INCH = 100 FEET

N

REVISIONS

DATE	
1	
2	
3	
4	
5	
6	
7	

UTILITY SEPARATIONS



UTILITY CONSTRUCTION NOTES (DEP)

62-555.314 Location of Public Water System Mains: For the purpose of this section, the phrase "Water Mains" shall mean Mains, including Treatment Plant process piping, conveying either raw, partially treated, or finished drinking water; Fire Hydrantleads; and service lines that are under the control of a Public Water System and that have an inside diameter of three (3") inches or greater.

(1) Horizontal Separation Between Underground Water Mains and Sanitary or Storm Sewers, Wastewater or Storm water Force Mains, Reclaimed Water Pipelines, and On-site Sewage Treatment and Disposal Systems:
(a) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (3) three feet between the outside of the WATER MAIN and the outside of any existing or proposed Storm Sewer, Storm water Force Main, or pipeline conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
(b) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (3) three feet, and preferably (10) Ten Feet, between the outside of the WATER MAIN and the outside of any existing or proposed vacuum-type Sanitary Sewer.
(c) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (6) Six Feet, and preferably (10) Ten Feet, between the outside of the WATER MAIN and the outside of any existing or proposed Gravity- or Pressure-type Sanitary Sewer, Wastewater Force Main, or pipeline conveying reclaimed water not regulated under Part III of Chapter 62-610 F.A.C. The Minimum Horizontal Separation distance between WATER MAINS and Gravity-type Sanitary Sewers shall be reduced to (3) Three Feet where the BOTTOM of the WATER MAIN is laid at least (6) Six Inches above the Top of the Sewer.
(d) New or relocated, underground WATER MAINS shall be laid to provide a horizontal distance of at least (10) Ten Feet between the outside of the WATER MAIN and all parts of any existing or proposed "On site Sewage Treatment and Disposal System" as defined in Section 381.0065(2). F.S. and Rule 64E-6.002. F.A.C.

(2) Vertical Separation Between Underground WATER MAINS and Sanitary or Storm Sewers, Wastewater or Storm water Force Mains, and Reclaimed Water Pipelines:
(a) New or relocated underground WATER MAINS crossing any existing or proposed gravity-or vacuum-type sanitary sewer or storm sewer shall be laid so the outside of the WATER MAIN is at least (6) Six Inches, and preferably 12 inches above, or at least 12 Inches below the outside of the other pipeline. However, it is preferable to lay the WATER MAIN "ABOVE" the other pipeline.
(b) New or relocated, Underground WATER MAINS crossing any existing or proposed pressure-type sanitary sewer, wastewater or stormwater Force Main, or Pipeline conveying reclaimed water shall be laid so the outside of the WATER MAIN is at least (12) inches ABOVE or BELOW the Outside of the other pipeline. However, it is preferable to lay the WATER MAIN above the other pipeline.
(c) At the Utility crossings described in paragraphs (a) & (b) Above, one full length of Water Main Pipe shall be centered above or below the other pipeline so the WATER MAIN Joints will be as far as possible from the other pipeline. Alternatively, at such crossings, the pipes shall be arranged so that all WATER MAIN Joints are at least (3) Three feet from all joints in Vacuum-type Sanitary Sewers, Storm Sewers, Stormwater Force Mains, or pipelines conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C., and at least (6) Six Feet from all Joints in Gravity- or Pressure-type Sanitary Sewers, Wastewater force mains, or pipelines conveying reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

(3) Separation Between WATER MAINS and Sanitary or Storm Sewer Manholes:
(a) No WATER MAIN shall pass thru, or come into contact with any part of a Sanitary Manhole or a Storm Sewer Manhole.

(4) Separation Between Fire Hydrant Drains and Sanitary or Storm Sewers, Wastewater or Stormwater Force Mains, reclaimed Water Pipelines, and On-Site Sewage Treatment and Disposal Systems. New or relocated Fire Hydrants with underground Drains shall be located so that the drains are at least (3) Three Feet from any existing or proposed storm sewer, Stormwater force main, or pipeline conveying reclaimed water regulated under Part III of Chapter 62-610, F.A.C.; at least (3) Three Feet, and preferably (10) Ten Feet, from any existing or proposed Sanitary Sewer, Wastewater force main, or pipeline conveying reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.; and at least (10) Ten Feet from any existing or proposed "on-site sewage treatment and disposal system" as defined in Section 381.0065(2), F.S. and Rule 64E-6.002, F.A.C.

(5) Exceptions/Mitigation: Adherence to the above Constraints and Separations in Items 1 through 4 shall be Complied to, "WITHOUT EXCEPTION". If for some reason where it is not technically feasible or Economically Sensible that Items 1 through 4 cannot be complied with, Contractor will Stop Work and Notify the Engineer of record for the appropriate solution, which will be submitted to "The Department of Environmental Protection" for APPROVAL, prior to work commencement.

COLOR CODING

All water main pipe, including fittings, installed on or after August 28, 2003, except pipe installed under a construction permit for which the Department received complete application before August 28, 2003, shall be color coded or marked using blue as a predominate color to differentiate drinking water from reclaimed or other water. Under-ground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall; and underground metal or concrete pipe shall have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90° intervals around the pipe, and will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Aboveground pipe as drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555.320(10),F.A.C., and all other aboveground pipe shall be painted blue or shall be color coded or marked like underground pipe.

GENERAL WATER NOTES

1. Water system components shall be installed in strict accordance with all local codes and regulations, cleaned, disinfected and bacteriologically cleared for service in accordance with the latest AWWA Standards and Chapter 62-555 Florida Administrative Code.
2. All piping shall bear the "NSF" seal for Potable Water.
3. Water mains shall be PVC conforming to AWWA C-900, DR 18 for pipe sizes 4"-12". Pipes 14" or larger shall bo AWWA C-905, DR 18. All couplings, cleaning compounds, solvents, lubricants, and pipe preparation, for laying, shall be in accordance with the pipe manufacturers latest recommendations.
4. Depth of water lines to be 36" minimum cover from finish grade.
5. Water mains to be located 6.00' from back of curb or edge of pavement unless otherwise noted.
6. All sleeves under pavement shall extend 5' beyond the back of curb.
7. Disinfecting: Following the pressure testing, the Contractor shall disinfect all sections of the water distribution system. Disinfection shall be in accordance with the applicable provisions of AWWA Standard C651 "Disinfecting Water Mains", and all appropriate agency approval.
8. All Hydrostatic Tests shall be in accordance with AWWA C600 for Ductile Iron Pipe and C605/M23 for PVC pipe.
9. All water mains shall be installed, pressure and leak tested in accordance with AWWA C600, (62-555.320(21)(b)1 AND 62-555.330, F.A.C. All installation, testing and field procedures must be provided and must conform to the applicable AWWA Standards.
10. All piping materials and specifications covering pipes, joints and packing materials, internal coating and linings, fittings, specials and appurtenances shall all be in accordance with he corresponding AWWA Standards and be conforming to NSF requirements, as may be applicable, with exceptions allowed only if documentation and assurances are provided in compliance with Paragraphs 62-555.320(3) (d) 62-555.320 (3) (b), and 62-555.320 (21) (c), F.A.C. The Lead Use Prohibition in Rule 62-555.322, F.A.C. shall also apply. Polyethylene tubing shall be per AWWA C901. Underground service lines and valves shall be per AWWA C809.
11. All existing wells on site to be abandoned in accordance with all applicable FDEP and SJRNWD requirements.

BOOTH ERN STRAUGHAN HIOTT
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Tavares, Florida 32778
www.boothernstraughan.com
Office: 352.343.8481
Fax: 352.343.9435
Certificate of Authorization Number: 27069

VENEZIA NORTH RESIDENTIAL SUBDIVISION
UTILITY PLAN

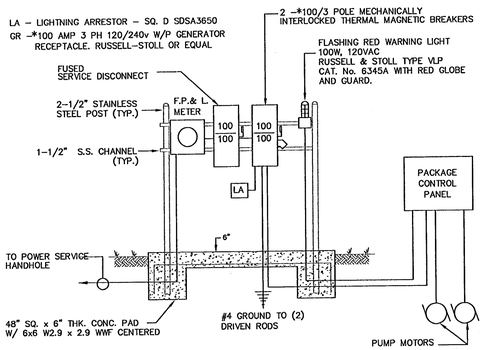
CHECKED BY: CCH
PROJECT NO.: 051373.0000
DATE: JUNE 2006
DESIGNED/DRAWN BY: LCS
SHT. 6 OF 22

APR 13 2007

CHARLES C. HIOTT, P.E.
PROFESSIONAL ENGINEER 54813

18971-8
RECEIVED
APR 13 2007
PDS
ALTAMONTE SVC. CTR.

S:\(0D)LAKE\051373.COCO LYKES BROTHERS\Improvement plans\SJRNWD sheets\north-sheets.dwg, 04/11/2007 09:36:14 AM, 1or1



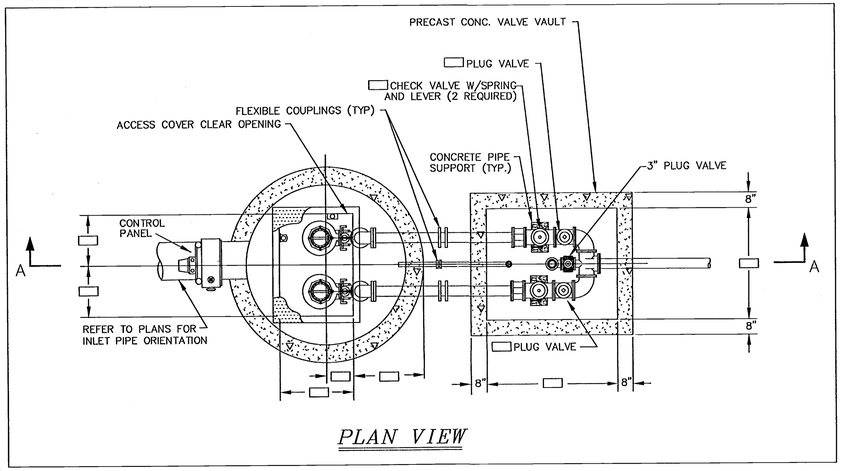
NOTES:

1. SUPPORT FRAME TO BE FABRICATED FROM 316 STAINLESS STEEL. ALL SCREWS, NUTS, BOLTS, STRAPS, AND SIMILAR CONNECTORS SHALL BE 316 STAINLESS STEEL. PROVIDE NEOPRENE PAD AND/OR FIBER WASHERS BETWEEN DISSIMILAR METALS.
2. ALL CONDUIT AND FITTINGS WITHIN 12" OF EQUIPMENT PAD AND GRADE TO BE RGS.
3. ALL BOXES, FITTINGS AND PIPES TO BE NEMA 4X STAINLESS STEEL.
4. MINIMUM 2 GROUND RODS SPACED A MINIMUM OF 6.0' APART.
5. * THIS INFO APPLIES TO TYPICAL 25 HP OR LESS LIFT STATION INSTALLATIONS. ENGINEER/CONTRACTOR SHALL VERIFY SPECIFIC ELECTRICAL AMPERAGE REQUIREMENTS PRIOR TO ORDERING AND INSTALLING EQUIPMENT

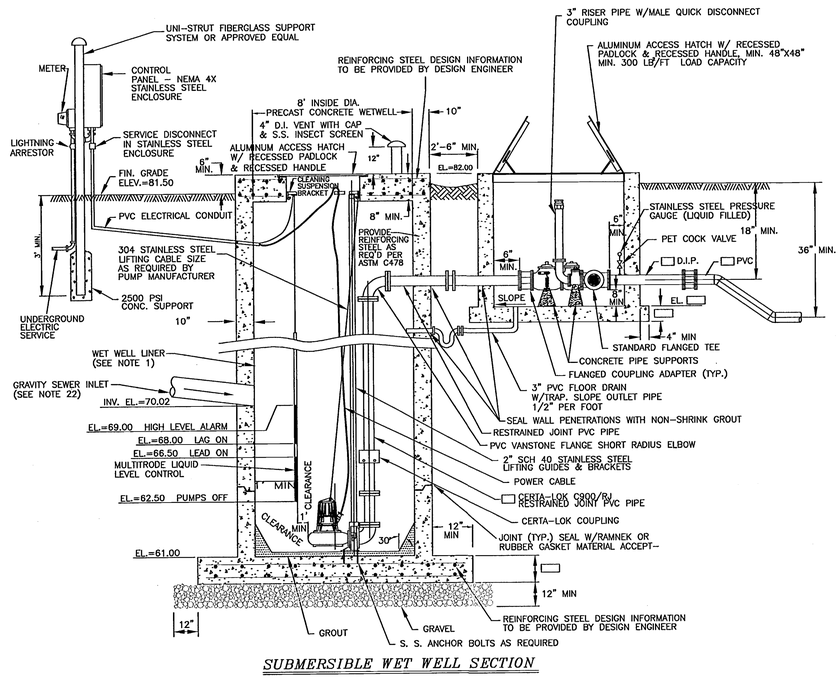
PACKAGED LIFT STATION
ELECTRICAL EQUIPMENT RACK

GENERAL NOTES SUBMERSIBLE PUMP STATION:

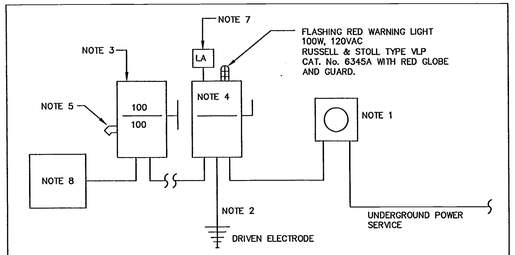
1. WET WELL SHALL BE LINED WITH "AGRU SURE GRIP" CONCRETE PROTECTIVE LINER OR APPROVED EQUAL. WET WELL EXTERIOR SHALL BE COATED WITH COAL TAR EPOXY.
2. BASE AND FIRST RISER UNIT TO BE CAST MONOLITHIC.
3. VALVE VAULT AND ACCESS COVERS SHALL BE SIZED TO PERMIT EASY REMOVAL OF CHECK VALVE.
4. VALVE VAULT SHALL HAVE SEALED FLOOR W/DRAIN TO WET WELL – TRAP REQUIRED.
5. ALL LOCATIONS WHERE PIPES ENTER OR LEAVE THE WET WELL OR VALVE VAULT SHALL BE MADE WATERTIGHT WITH WALL SLEEVE OR NON–SHRINK GROUT.
6. PUMP LIFTING DEVICE SHALL BE 304 SS LIFTING CABLE.
7. THERE SHALL BE NO ELECTRICAL JUNCTION BOXES IN WET WELL OR VALVE VAULT.
8. CHECK VALVES SHALL BE OUTSIDE WEIGHT & LEVER.
9. WET WELL & VALVE VAULT COVERS SHALL BE ALUMINUM WITH 304S.S HARDWARE, AS RECOMMENDED AND REQUIRED BY PUMP MANUFACTURER (LOADING 300 P.S.F.) AND PROVIDED WITH RECESSED LOCKS.
10. CONTROL PANEL SHALL BE AS MANUFACTURED BY THE PUMP SUPPLIER OR APPROVED EQUAL.
11. WET WELL DIAMETER SHALL BE 6' NOMINAL.
12. ACCESS HATCH DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE PUMPING EQUIPMENT, PIPING AND CONCRETE STRUCTURES TO ENSURE ADEQUATE ACCESS OPENINGS FOR INSTALLATION, OPERATION AND MAINTENANCE OF ALL EQUIPMENT.
13. FURNISH AND INSTALL GENERATOR RECEPTACLE
14. VALVE VAULT AND WET WELLS SHALL BE PRECAST CONCRETE. SUBMIT SHOP DRAWINGS WITH REINFORCING DETAILS FOR APPROVAL PRIOR TO FABRICATION.
15. CHAIN LINK FENCE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:
    A) POSTS SHALL BE SCHEDULE 40, GALVANIZED STEEL (2" OUTSIDE DIAMETER MIN.), MAXIMUM 10 FOOT SPACING
    B) FABRIC FOR FENCING AND GATES SHALL BE 9 GAUGE 2" MESH, CLASS 1, CONFORMING TO A.S.T.M. A–3920, 1.2 OZ. GALVANIZED COATING.
    C) POSTS SHALL BE SET IN 2500 PSI CONCRETE IN AN 8" DIAMETER HOLE WITH A DEPTH OF 36 INCHES.
    D) FENCING SHALL BE SCREENED WITH PVC SLATS, FEATHERLOCK OR APPROVED EQUAL. COLOR SHALL BE GREEN OR BLACK.
16. AUXILIARY POWER CONNECTION:
    A) FOR PUMPS < 10HP – RUSSELL & STOLL CAT. NO. FCF 3134–W–72, 100 AMP, 230 VOLT OR APPROVED EQUAL
    B) FOR PUMPS ≥ 10HP – RUSSELL & STOLL CAT. NO. FCF 3134–W–72, 200 AMP, 230 VOLT AR2042 – CROUSE–HINDS, OR APPROVED EQUAL
17. • HAND – (ON–OFF) – AUTOMATIC SWITCHES ON ALL PUMPS.
    • MANUAL – (ON–OFF) – SWITCH ON ALL ALTERNATORS.
    • ONE ELAPSED TIME METER FOR EACH PUMP.
    • 120 VOLT RECEPTACLE INSIDE CONTROL BOX.
    • 3 PHASE CURRENT (WILL NOT ACCEPT ADD A PHASE OR CAPACITOR PHASE CHANGERS).
    • POWER CABLE TO PUMPS RUN IN CONDUIT SEPARATE FROM FLOAT SWITCH CONDUIT.
    • LIQUID FILLED PRESSURE GAUGE ON FORCE MAIN.
18. FLOAT SWITCHES, MUST BE TRANSFORMER ISOLATED–24 VOLT MAX. ALL CONNECTIONS MUST TERMINATE IN CONTROL PANEL OUTSIDE OF WET WELL.
19. KNIFE SWITCH DISCONNECT BETWEEN POWER SUPPLY AND LIFT STATION CONTROL PANEL.
20. SHAKESPEARE FIBERGLASS LIGHT POLE CATALOG #B520 OR #B524 OR APPROVED EQUAL.
21. RUDD LIGHT 250W #FS3425–M OR APPROVED EQUAL.
22. SEAL GRAVITY PIPE AT WETWELL WITH RUBBER BOOT SEAL.
23. PUMP CONTROLLERS SHALL BE MULTI–TRODE MODEL MTPC CONTROLLER AND MTTS–5 SUPPRESSOR.



PLAN VIEW



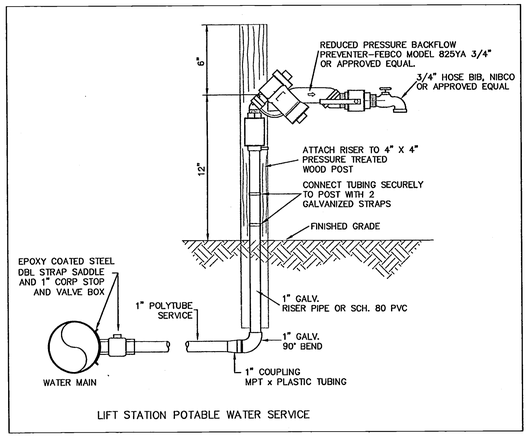
SUBMERSIBLE WET WELL SECTION



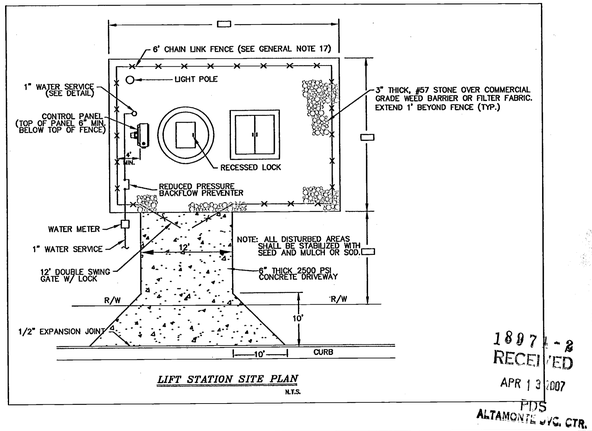
NOTES:

1. ALL BOXES, INCLUDING SWITCH GEAR, ELECTRIC METER CANS, DISCONNECT, AND ALL MISC. ELECTRICAL BOXES SHALL BE NEMA 4X STAINLESS STEEL. ALL BRACKETS, PIPING, BOLTS, NUTS, WASHERS, AND ANY FASTENERS SHALL BE 316 SS.
2. METER WITH BYPASS.
3. SERVICE GROUND TO INCLUDE 3 – 10' ELECTRODES ON 10' CENTERS BOND TO SLAB REBAR. USE #4 BARE COPPER MIN.
4. 100 AMP 3–POLE, CIRCUIT BREAKER MANUAL TRANSFER SWITCH IN WEATHERPROOF ENCLOSURE.
5. 100 AMP 3 POLE S–N FUSED 240 VOLT WEATHERPROOF DISCONNECT.
6. GENERATOR RECEPTACLE, RUSSELL & STOLL
7. PACKAGE PUMP STATION CONTROL PANEL
8. LIGHTNING ARRESTOR – SQUARE D No. SDSA 3650.

PACKAGED LIFT STATION
ELECTRICAL SERVICE SCHEMATIC



LIFT STATION POTABLE WATER SERVICE



LIFT STATION SITE PLAN
N.T.S.

REVISIONS							
DATE							
	1	2	3	4	5	6	7

BOOTH ERN STRAUGHAN HOTT
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Tarpon Springs, FL 34689
www.besandh.com
Office: 352-343-8481
Fax: 352-343-8495
Certificate of Authorization Number: 27029

VENEZIA NORTH
RESIDENTIAL SUBDIVISION
LIFT STATION DETAILS

CHECKED BY:	CCH
PROJECT NO.:	051373.0000
DATE:	JUNE 2006
DRAWN BY:	LCS
DESIGNED BY:	LCS
SHT	18 OF 22

CHARLES C. HIOTT, P.E.
PROFESSIONAL ENGINEER 54813

APR 13 2007

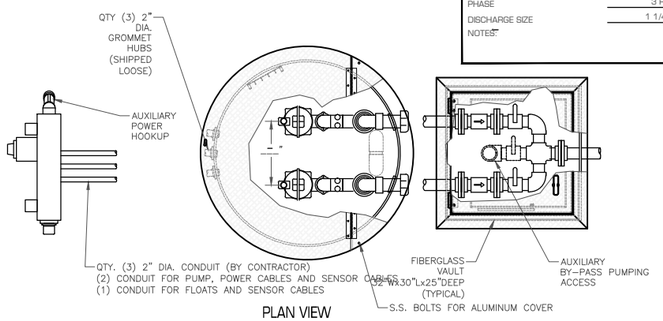
18974-2
RECEIVED
APR 13 2007
PDS
ALTAMONTE SPG. CTR.

S:\COD\LAKE\051373.0000 LYKES BROTHERS\Improvement plans\covers-details\SJRNWD\north\18 Lift Station Details.dwg, 04/11/2007 09:28:26 AM, lort

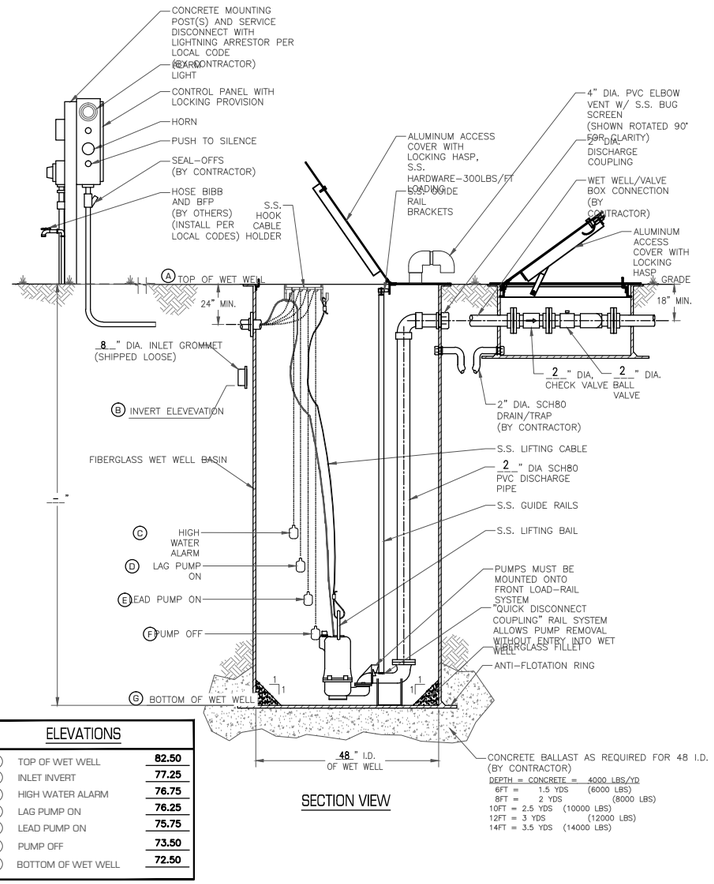
LIFT STATION #1

PUMP DATA TABLE	
PUMP MODEL	HPG200
IMPELLER DIAMETER	5.25"
PUMP DESIGN CAPACITY	28 GPM
PUMP DESIGN TDH	97 FT
SECONDARY CAPACITY	33 GPM
SECONDARY TDH	89 FT
HORSEPOWER	2 HP
VOLTAGE	230 V
PHASE	3 PH
DISCHARGE SIZE	1 1/4"
NOTES	

WET WELL/VALVE BOX LAYOUT



PLAN VIEW



SECTION VIEW

ELEVATIONS		
A	TOP OF WET WELL	82.50
B	INLET INVERT	77.25
C	HIGH WATER ALARM	76.75
D	LAG PUMP ON	76.25
E	LEAD PUMP ON	75.75
F	PUMP OFF	73.50
G	BOTTOM OF WET WELL	72.50

GENERAL NOTES

PUMPS SHALL BE OF THE SUBMERSIBLE TYPE (MANUFACTURED BY HYDROMATIC OR HOMA). EACH PUMP SHALL BE MOUNTED ON A Ø2" RAIL SYSTEM. THE RAIL SYSTEM SHALL BE SELF ENGAGING RESULTING IN A LEAKPROOF COUPLING. THE RAIL SYSTEM SHALL INCLUDE THE BASE ELBOW, DISCHARGE FLANGE ASSEMBLY, 304SS GUIDE RAILS, 316SS UPPER GUIDE BRACKET, 316SS LIFTING BAIL AND CABLE, AND A SIX-HOOK 316SS CABLE HOLDER. THE RAIL SYSTEM SHALL BE MOUNTED AND PRE-PIPED BY THE PUMP SUPPLIER.

PUMP CONSTRUCTION
THE PUMP VOLUTE, MOTOR AND SEAL HOUSING SHALL BE CONSTRUCTED OF CAST IRON. ALL EXTERNAL FASTENERS SHALL BE SERIES 300 STAINLESS STEEL. THE PUMP SHAFT SHALL BE CONSTRUCTED OF SERIES 416 STAINLESS STEEL.

IMPELLER
THE IMPELLER SHALL BE OF MULTI-VANE, SEMI-OPEN CONSTRUCTION. THE IMPELLER SHALL BE STATICALLY AND HYDRAULICALLY BALANCED.

CUTTERS
A CUTTER ASSEMBLY SHALL BE MOUNTED ON THE SUCTION SIDE OF THE PUMP WITH DIRECT DISCHARGE INTO THE PUMP IMPELLER. THE GRINDER SHALL BE CAPABLE OF GRINDING MATERIALS FOUND IN NORMAL, DOMESTIC SEWAGE. BOTH THE STATIONARY AND ROTATING CUTTERS SHALL BE CONSTRUCTED OF HARDENED STEEL.

MOTOR
THE MOTOR SHALL BE MOUNTED IN A SEALED, SUBMERSIBLE TYPE HOUSING. THE STATOR SHALL BE SECURELY HELD IN PLACE WITH A REMOVABLE END RING AND THREADED FASTENERS FOR EASE OF REMOVAL WITHOUT THE USE OF HEAT OR A PRESS. THE MOTOR WILL HAVE TWO HEAVY-DUTY BALL BEARINGS; ONE UPPER (RADIAL) AND ONE LOWER (THRUST), TO SUPPORT THE SHAFT. THE MOTOR SHALL BE EQUIPPED WITH A WINDING THERMOSTAT THAT IS WIRED TO SHUT THE MOTOR OFF IN CASE OF MOTOR OVERHEATING.

SEAL CHAMBER
THE PUMP SHALL HAVE TWO MECHANICAL SEALS, MOUNTED IN TANDEM WITH AN OIL CHAMBER BETWEEN THE SEALS. THE PUMP SHALL BE EQUIPPED WITH A SEAL LEAK DETECTION PROBE AND WARNING SYSTEM BY USING A SEAL FAILURE SENSOR INSTALLED IN THE SEAL CHAMBER.

WET WELL
THE PUMP SUPPLIER SHALL PROVIDE THE WET WELL. THIS GLASS FIBER-REINFORCED POLYESTER BASIN SHALL BE CONSTRUCTED OF A COMMERCIAL GRADE OF GLASS FIBER AND SHALL BE PROVIDED WITH FILLET AND AN ANTI-FLOTATION RING WITH A MINIMUM DIAMETER OF THREE INCHES LARGER THAN THE BASIN DIAMETER. THE RAIL SYSTEM, INTERNAL PIPING AND DISCHARGE CONNECTIONS SHALL BE PRE-INSTALLED BY THE PUMP SUPPLIER.

HATCH COVER
THE HATCH COVER SHALL BE 2/3 HINGED TO ALLOW FOR MAXIMUM ACCESS TO THE WET WELL. THE HATCH COVER SHALL BE ALUMINUM WITH STAINLESS STEEL FASTENERS, RATED FOR 300 PSF OR GREATER. THE HATCH COVER SHALL INCLUDE A SINGLE OR DUAL DOOR OF DIMENSIONS SPECIFIED BY THE PUMP MANUFACTURER FOR PROPER PUMP CLEARANCE. THE COVER SHALL BE MANUFACTURED BY US FABRICATION, OR EQUAL.

VALVE BOX
THE VALVE BOX IS FIBERGLASS WITH ALUMINUM LOCKABLE COVER. STANDARD SIZE VALVE BOX IS 32"x30"x25".

VALVES
VALVES SHALL BE SEWAGE SWING CHECK WITH CLEAN-OUT PORTS AND BRASS GATE VALVES.

FLOATS
FLOATS SHALL BE ANCHOR SCIENTIFIC ROTO-FLOATS OR EQUAL.

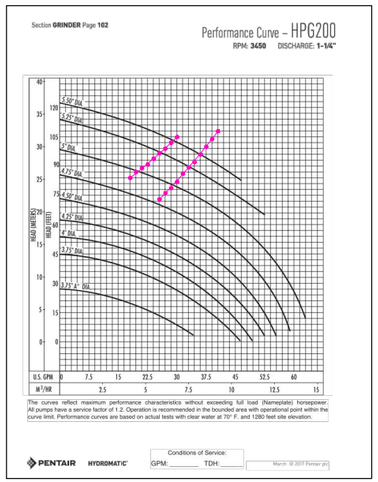
CONTROLS
THE CONTROL PANEL SHALL BE UL508 LISTED. A NEMA 3R ENCLOSURE SHALL BE PROVIDED IN 4X FIBERGLASS. THE PANEL SHALL INCLUDE AN ALTERNATING CONTROL SCHEME (DUPLEX AND ABOVE), MAIN CIRCUIT BREAKER, GENERATOR RECEPTACLE, HIGH LEVEL ALARM LIGHT AND HORN, ELAPSED TIME METERS, VOLTAGE OR PHASE MONITOR, SEAL FAILURE AND OVERLOAD SENSORS. THE LIGHTNING ARRESTOR SHALL BE PROVIDED BY CONTRACTOR.

ELECTRICAL
ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES.

SUPPLIER
PUMP SUPPLIER SHALL PROVIDE SUBMERSIBLE PUMPS, SLIDE RAIL ASSEMBLIES, FIBERGLASS BASIN AND VALVE BOX, CONTROL PANEL, FLOAT SWITCHES, ALUMINUM HATCHES AND ACCESSORIES TO INSURE PROPER OPERATIONS AND WARRANTY. THE COMPLETE PACKAGE PUMPING STATION SHALL HAVE PUMP BASES, RAIL ASSEMBLIES, AND DISCHARGE PIPING ASSEMBLED BY BARNEY'S PUMPS INC. READY FOR FIELD INSTALLATION.

PUMP PACKAGE SHALL BE SUPPLIED BY BARNEY'S PUMPS INC. IN LAKELAND (863-665-8500), CORAL SPRINGS (954-346-0669), OR JACKSONVILLE (904-260-0669), FL.

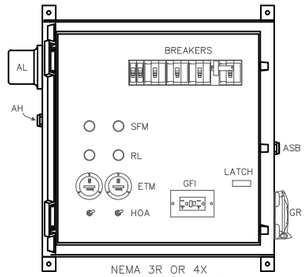
PUMP PERFORMANCE CURVE



ELECTRICAL

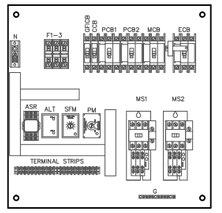
INCOMING POWER: ____V ____ Ø
(CONTRACTOR TO VERIFY)

ENCLOSURE AND DEADFRONT LAYOUT (TYPICAL)
(OUTER DOOR REMOVED)



NEMA 3R OR 4X
FIBERGLASS ENCLOSURE

BASE PLATE LAYOUT (TYPICAL)

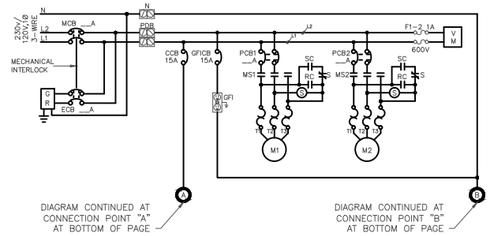


FIELD TERMINALS

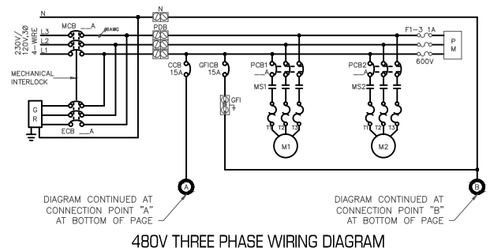
LEGEND

ABBR.	DESCRIPTION
ENC	ENCLOSURE, F.G., NEMA 4X
MCB	MAIN CIRCUIT BREAKER
ECB	EMERGENCY CIRCUIT BREAKER
N	NEUTRAL BLOCK
PDB	POWER DISTRIBUTION BLOCK
PCB1,2	PUMP CIRCUIT BREAKER
CCB	CONTROL CIRCUIT BREAKER
GFCB	GFI CIRCUIT BREAKER
MS1,2	MOTOR STARTER
OL	OVERLOAD HEATER
S	START RELAY
SC	START CAPACITOR
RC	RUN CAPACITOR
GR	GENERATOR RECEPTACLE
F_	FUSE, 1A 600V
VM	VOLTAGE MONITOR
PM	PHASE MONITOR
XFMR	TRANSFORMER
GFI	GFI RECEPTACLE
AL	ALARM LIGHT
AH	ALARM HORN
ASB	ALARM SILENCE BUTTON
ASR	ALARM SILENCE RELAY
SFM	SEAL FAIL MODULE
IL	INDICATING LIGHT, RED
ALT	ALTERNATOR
HOA	HAND OFF AUTO SWITCH
RL	RUN LIGHT, GREEN
ETM	ELAPSED TIME METER

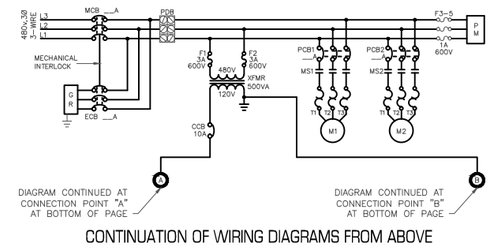
230V SINGLE PHASE WIRING DIAGRAM



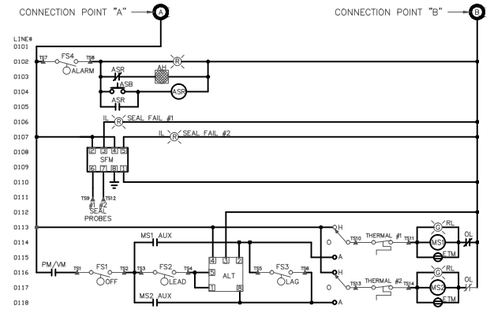
230V THREE PHASE WIRING DIAGRAM



480V THREE PHASE WIRING DIAGRAM



CONTINUATION OF WIRING DIAGRAMS FROM ABOVE



UL LISTED
ENCLOSED INDUSTRIAL CONTROL PANEL

PANEL MANUFACTURER SHALL BE UL 508 AND UL 698A LISTED.

BARNEY'S PUMPS, INC.
PO BOX 3529, LAKELAND, FL 33802
PHONE: (863) 665-8500 FAX: (863) 666-3858

PROJECT		
CUSTOMER	SALESPERSON	
TITLE: GRINDER DUPLEX FIBERGLASS LIFT STATION		REV. 0
DATE: 04/26/2018	DWG. #: WW2GFVFM	DRAWN BY: R.R.B.

DONALD A. GRIFFEY
FLORIDA 036799

GRIFFEY ENGINEERING, INC.
36202 East Eldorado Lake Dr.
EUSTIS, FLORIDA 32736
(352) 589-2368

Town of Howey-In-The-Hills
101 N. Palm Avenue
P.O. Box 128
Howey-In-The-Hills, FL 34737
(352) 324-2290

HOWEY-IN-THE-HILLS
DOWNTOWN SEWER

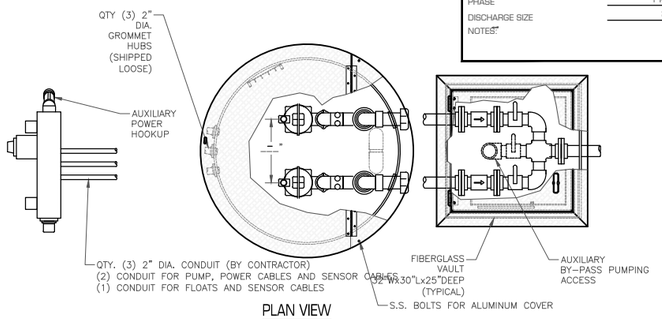
LIFT STATION 1

Date	Drawn By: DAG
	Drawing #: DWTN SEWER
	Project #: 15028
04-06-21	Scale: AS NOTED
03-08-21	

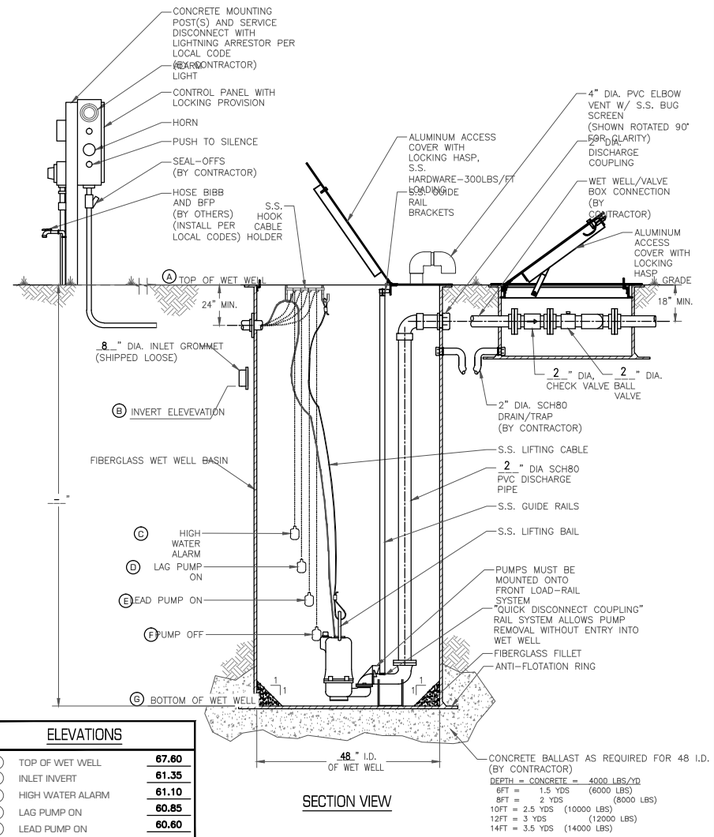
SHEET 19 of 22

LIFT STATION #2

WET WELL/VALVE BOX LAYOUT



PLAN VIEW



SECTION VIEW

ELEVATIONS

A	TOP OF WET WELL	67.60
B	INLET INVERT	61.35
C	HIGH WATER ALARM	61.10
D	LAG PUMP ON	60.85
E	LEAD PUMP ON	60.60
F	PUMP OFF	58.60
G	BOTTOM OF WET WELL	57.60

PUMP DATA TABLE

PUMP MODEL	HPGH-500
IMPELLER DIAMETER	6.25"
PUMP DESIGN CAPACITY	59 GPM
PUMP DESIGN TDH	111.7 FT
SECONDARY CAPACITY	70 GPM
SECONDARY TDH	104 FT
HORSEPOWER	5 HP
VOLTAGE	230 V
PHASE	1 PH
DISCHARGE SIZE	2"
NOTES	

GENERAL NOTES

PUMPS SHALL BE OF THE SUBMERSIBLE TYPE (MANUFACTURED BY HYDROMATIC OR HOMA). EACH PUMP SHALL BE MOUNTED ON A 02" RAIL SYSTEM. THE RAIL SYSTEM SHALL BE SELF ENGAGING RESULTING IN A LEAKPROOF COUPLING. THE RAIL SYSTEM SHALL INCLUDE THE BASE ELBOW, DISCHARGE FLANGE ASSEMBLY, 304SS GUIDE RAILS, 316SS UPPER GUIDE BRACKET, 316SS LIFTING BAIL AND CABLE, AND A SIX-HOOK 316SS CABLE HOLDER. THE RAIL SYSTEM SHALL BE MOUNTED AND PRE-PIPED BY THE PUMP SUPPLIER.

PUMP CONSTRUCTION
THE PUMP VOLUTE, MOTOR AND SEAL HOUSING SHALL BE CONSTRUCTED OF CAST IRON. ALL EXTERNAL FASTENERS SHALL BE SERIES 300 STAINLESS STEEL. THE PUMP SHAFT SHALL BE CONSTRUCTED OF SERIES 416 STAINLESS STEEL.

IMPELLER
THE IMPELLER SHALL BE OF MULTI-VANE, SEMI-OPEN CONSTRUCTION. THE IMPELLER SHALL BE STATICALLY AND HYDRAULICALLY BALANCED.

CUTTERS
A CUTTER ASSEMBLY SHALL BE MOUNTED ON THE SUCTION SIDE OF THE PUMP WITH DIRECT DISCHARGE INTO THE PUMP IMPELLER. THE GRINDER SHALL BE CAPABLE OF GRINDING MATERIALS FOUND IN NORMAL, DOMESTIC SEWAGE. BOTH THE STATIONARY AND ROTATING CUTTERS SHALL BE CONSTRUCTED OF HARDENED STEEL.

MOTOR
THE MOTOR SHALL BE MOUNTED IN A SEALED, SUBMERSIBLE TYPE HOUSING. THE STATOR SHALL BE SECURELY HELD IN PLACE WITH A REMOVABLE END RING AND THREADED FASTENERS FOR EASE OF REMOVAL WITHOUT THE USE OF HEAT OR A PRESS. THE MOTOR WILL HAVE TWO HEAVY-DUTY BALL BEARINGS; ONE UPPER (RADIAL) AND ONE LOWER (THRUST), TO SUPPORT THE SHAFT. THE MOTOR SHALL BE EQUIPPED WITH A WINDING THERMOSTAT THAT IS WIRED TO SHUT THE MOTOR OFF IN CASE OF MOTOR OVERHEATING.

SEAL CHAMBER
THE PUMP SHALL HAVE TWO MECHANICAL SEALS, MOUNTED IN TANDEM WITH AN OIL CHAMBER BETWEEN THE SEALS. THE PUMP SHALL BE EQUIPPED WITH A SEAL LEAK DETECTION PROBE AND WARNING SYSTEM BY USING A SEAL FAILURE SENSOR INSTALLED IN THE SEAL CHAMBER.

WET WELL
THE PUMP SUPPLIER SHALL PROVIDE THE WET WELL. THIS GLASS FIBER-REINFORCED POLYESTER BASIN SHALL BE CONSTRUCTED OF A COMMERCIAL GRADE OF GLASS FIBER AND SHALL BE PROVIDED WITH FILLET AND AN ANTI-FLOTATION RING WITH A MINIMUM DIAMETER OF THREE INCHES LARGER THAN THE BASIN DIAMETER. THE RAIL SYSTEM, INTERNAL PIPING AND DISCHARGE CONNECTIONS SHALL BE PRE-INSTALLED BY THE PUMP SUPPLIER.

HATCH COVER
THE HATCH COVER SHALL BE 2/3 HINGED TO ALLOW FOR MAXIMUM ACCESS TO THE WET WELL. THE HATCH COVER SHALL BE ALUMINUM WITH STAINLESS STEEL FASTENERS, RATED FOR 300 PSF OR GREATER. THE HATCH COVER SHALL INCLUDE A SINGLE OR DUAL DOOR OF DIMENSIONS SPECIFIED BY THE PUMP MANUFACTURER FOR PROPER PUMP CLEARANCE. THE COVER SHALL BE MANUFACTURED BY US FABRICATION, OR EQUAL.

VALVE BOX
THE VALVE BOX IS FIBERGLASS WITH ALUMINUM LOCKABLE COVER. STANDARD SIZE VALVE BOX IS 32"x30"x25".

VALVES
VALVES SHALL BE SEWAGE SWING CHECK WITH CLEAN-OUT PORTS AND BRASS GATE VALVES.

FLOATS
FLOATS SHALL BE ANCHOR SCIENTIFIC ROTO-FLOATS OR EQUAL.

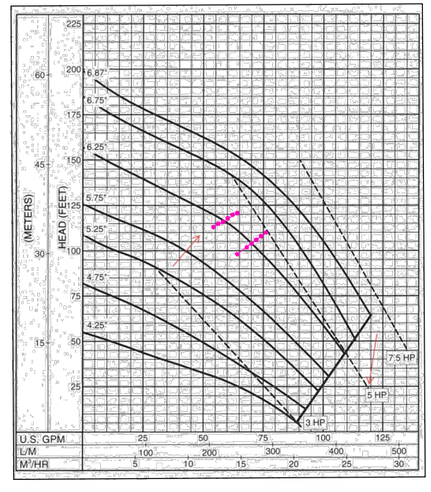
CONTROLS
THE CONTROL PANEL SHALL BE UL508 LISTED. A NEMA 3R ENCLOSURE SHALL BE PROVIDED IN 4X FIBERGLASS. THE PANEL SHALL INCLUDE AN ALTERNATING CONTROL SCHEME (DUPLEX AND ABOVE), MAIN CIRCUIT BREAKER, GENERATOR RECEPTACLE, HIGH LEVEL ALARM LIGHT AND HORN, ELAPSED TIME METERS, VOLTAGE OR PHASE MONITOR, SEAL FAILURE AND OVERLOAD SENSORS. THE LIGHTNING ARRESTOR SHALL BE PROVIDED BY CONTRACTOR.

ELECTRICAL
ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES.

SUPPLIER
PUMP SUPPLIER SHALL PROVIDE SUBMERSIBLE PUMPS, SLIDE RAIL ASSEMBLIES, FIBERGLASS BASIN AND VALVE BOX, CONTROL PANEL, FLOAT SWITCHES, ALUMINUM HATCHES AND ACCESSORIES TO INSURE PROPER OPERATIONS AND WARRANTY. THE COMPLETE PACKAGE PUMPING STATION SHALL HAVE PUMP BASES, RAIL ASSEMBLIES, AND DISCHARGE PIPING ASSEMBLED BY BARNEY'S PUMPS INC. READY FOR FIELD INSTALLATION.

PUMP PACKAGE SHALL BE SUPPLIED BY BARNEY'S PUMPS INC. IN LAKELAND (863-665-8500), CORAL SPRINGS (954-346-0669), OR JACKSONVILLE (904-260-0669), FL.

PUMP PERFORMANCE CURVE

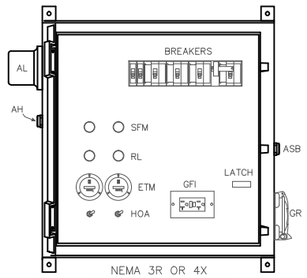


ELECTRICAL

INCOMING POWER: _____V _____ø
(CONTRACTOR TO VERIFY)

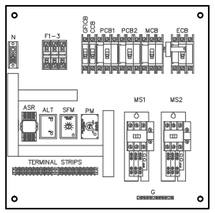
ENCLOSURE AND DEADFRONT LAYOUT (TYPICAL)

(OUTER DOOR REMOVED)

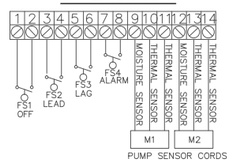


NEMA 3R OR 4X
FIBERGLASS ENCLOSURE

BASE PLATE LAYOUT (TYPICAL)



FIELD TERMINALS

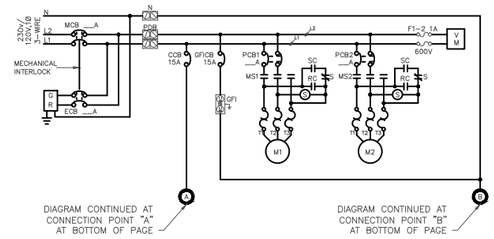


PUMP SENSOR CORDS

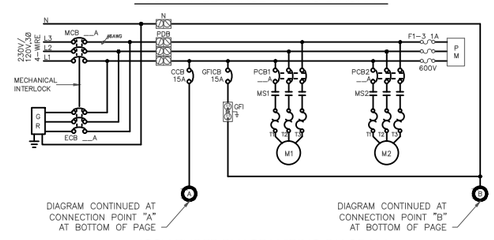
LEGEND

ABBR.	DESCRIPTION
ENC	ENCLOSURE, F.G., NEMA 4X
MCB	MAIN CIRCUIT BREAKER
ECB	EMERGENCY CIRCUIT BREAKER
N	NEUTRAL BLOCK
PDB	POWER DISTRIBUTION BLOCK
PCB1,2	PUMP CIRCUIT BREAKER
CCB	CONTROL CIRCUIT BREAKER
GFICB	GFI CIRCUIT BREAKER
MS1,2	MOTOR STARTER
OL	OVERLOAD HEATER
S	START RELAY
SC	START CAPACITOR
RC	RUN CAPACITOR
GR	GENERATOR RECEPTACLE
F	FUSE, 1A 600V
VM	VOLTAGE MONITOR
PM	PHASE MONITOR
XFMR	TRANSFORMER
GFI	GFI RECEPTACLE
AL	ALARM LIGHT
AH	ALARM HORN
ASB	ALARM SILENCE BUTTON
ASR	ALARM SILENCE RELAY
SFM	SEAL FAIL MODULE
RL	INDICATING LIGHT, RED
ALT	ALTERNATOR
HOA	HAND OFF AUTO SWITCH
RL	RUN LIGHT, GREEN
ETM	ELAPSED TIME METER

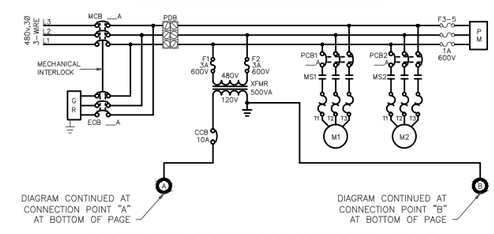
230V SINGLE PHASE WIRING DIAGRAM



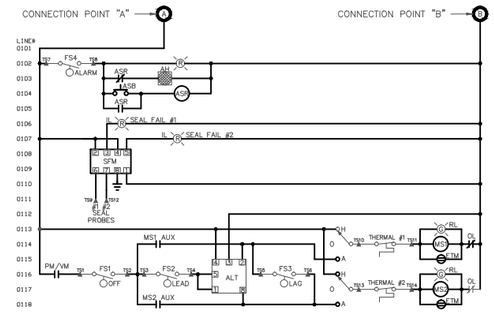
230V THREE PHASE WIRING DIAGRAM



480V THREE PHASE WIRING DIAGRAM



CONTINUATION OF WIRING DIAGRAMS FROM ABOVE



UL LISTED
ENCLOSED INDUSTRIAL CONTROL PANEL

PANEL MANUFACTURER SHALL BE UL 508 AND UL 698A LISTED.

BARNEY'S PUMPS, INC.
PO BOX 3529, LAKELAND, FL 33802
PHONE: (863) 665-8500 FAX: (863) 666-3858

PROJECT		
CUSTOMER	SALESPERSON	
TITLE: GRINDER DUPLEX FIBERGLASS LIFT STATION		REV. 0
DATE: 04/26/2018	DWG. # WW2GFVFM	DRAWN BY: R.R.B.

DONALD A. GRIFFEY
FLORIDA 036799

GRIFFEY ENGINEERING, INC.
36202 East Eldorado Lake Dr.
EUSTIS, FLORIDA 32736
(352) 589-2368

Town of Howey-In-The-Hills
101 N. Palm Avenue
P.O. Box 128
Howey-In-The-Hills, FL 34737
(352) 324-2290

HOWEY-IN-THE-HILLS
DOWNTOWN SEWER

LIFT STATION 2

Date	Drawn By: DAG
	Drawing #: DWTN SEWER
	Project #: 15028
04-06-21	
2 03-19-21	Scale: AS NOTED
03-08-21	

SHEET 20 of 22