

HILLSIDE GROVE

LIFT STATION #1

DESIGN REPORT

FOR

Lennar Homes - Orlando
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PREPARED BY:



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CWI Project No.: 21-04-0008

Connelly & Wicker, Inc.

HILLSIDE GROVE Index Sheet

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

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

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

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 $V_r < V_p$, Then, Adequate Storage is Provided

WET WELL INFORMATION

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

Refer To Construction Plans For Actual
Pump Station Configuration

Top El. 88.40
Grade El. 87.90

Effluent El. 85.40
(Force Main)

Control El. 69.60

Alarm El. 69.10

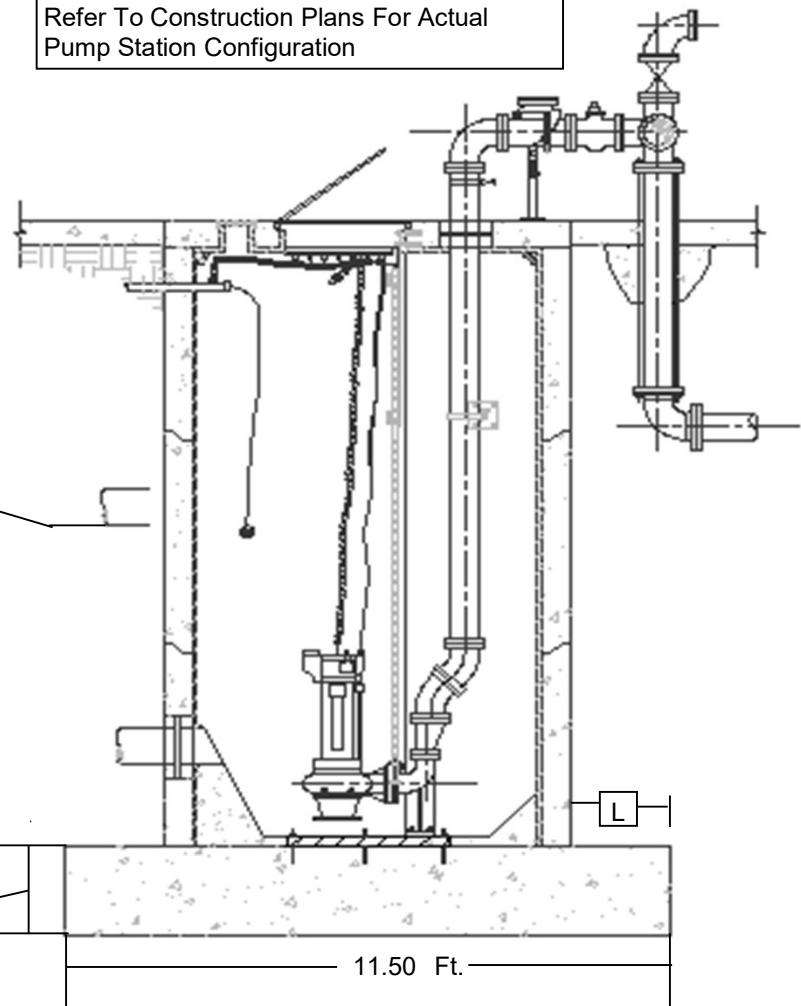
Lag Pump On El. 68.60

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
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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 58"	

Assume Saturated Conditions

Ground Water Elevation	=	87.90
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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)

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

	Volume (CF)	*	Unit Weight (lb/CF)	=	Force	Lbs.
Top Cover :	46.80	*	150	=	7019.58	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: 209827.33 Lbs.

UPLIFT FORCE

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

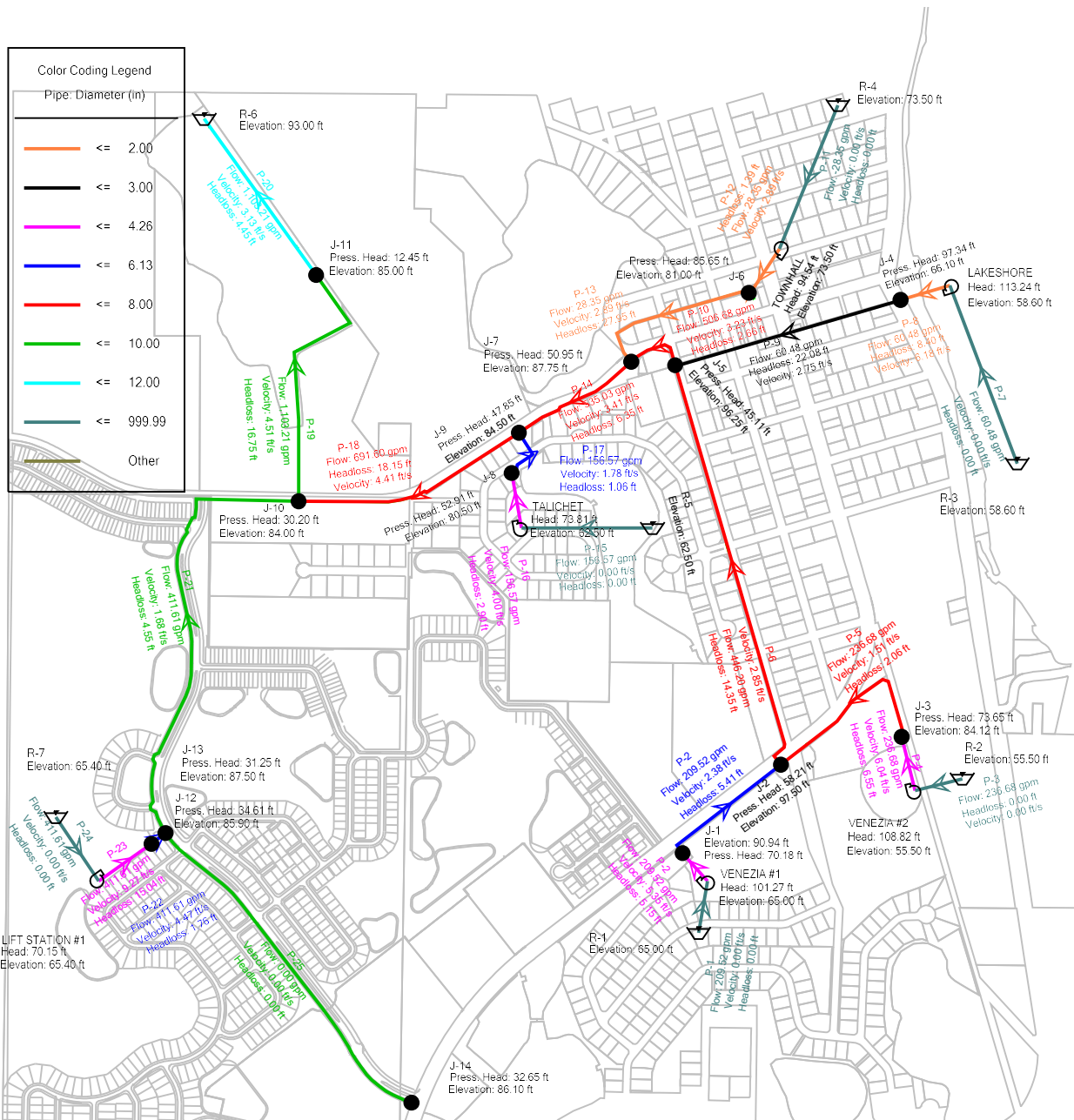
Uplift Force	=	1840.48	*	62.4	=	114846.10	Lbs.
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FACTOR OF SAFETY

$$\text{Factor of Safety} = \frac{\text{Downward Force}}{\text{Uplift Force}} = \frac{209827.33}{114846.10} = 1.83$$

Pump Information - Hydromatic				
Pump Type	2 Submersible Pumps			
Pump Model	Hydromatic - H4H(X)			
Motor	*See specifications page 40			
H.P. / Voltage / Phases / Amps	15 HP / 230V / 3 Phase / 53 A			
RPM	1750		R.P.M.	
Impeller Diameter	9.75		Inches	
Discharge Pipe Size	4		Inches	
Force Main Size	4		Inches	
Design Point	400.00	GPM @	68.70	TDH
Operating Point - Manifold Condition	411.61	GPM @	70.15	TDH
Operating Point - Runout Condition	498.64	GPM @	63.41	TDH

Scenario: Base (MANIFOLD CONDITION)



FlexTable: Junction Table (MANIFOLD CONDITION)

Label	Demand (gpm)	Elevation (ft)	Pressure (psi)	Pressure Head (ft)
J-1	0.00	90.94	30.4	70.18
J-2	0.00	97.50	25.2	58.21
J-3	0.00	84.12	31.9	73.65
J-4	0.00	66.10	42.1	97.34
J-5	0.00	96.25	19.5	45.11
J-6	0.00	81.00	37.1	85.65
J-7	0.00	87.75	22.0	50.95
J-8	0.00	80.50	22.9	52.91
J-9	0.00	84.50	20.7	47.85
J-10	0.00	84.00	13.1	30.20
J-11	0.00	85.00	5.4	12.45
J-12	0.00	85.90	15.0	34.61
J-13	0.00	87.50	13.5	31.25
J-14	0.00	86.10	14.1	32.65

FlexTable: Pipe Table (MANIFOLD CONDITION)

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	209.52	0.00	0.00	0.00	0.00
P-2	4.00	28	28	PVC	120.0	9.430	209.52	5.35	0.96	4.19	5.15
P-2	6.00	0	927	PVC	110.0	2.580	209.52	2.38	5.18	0.23	5.41
P-3	999.00	1	1	PVC	120.0	0.000	236.68	0.00	0.00	0.00	0.00
P-4	4.00	28	28	PVC	120.0	9.430	236.68	6.04	1.20	5.35	6.55
P-5	8.00	0	1,310	PVC	120.0	3.770	236.68	1.51	1.92	0.13	2.06
P-6	8.00	0	2,771	PVC	120.0	9.340	446.20	2.85	13.17	1.18	14.35
P-7	999.00	1	1	PVC	120.0	0.000	60.48	0.00	0.00	0.00	0.00
P-8	2.00	28	28	PVC	120.0	9.430	60.48	6.18	2.81	5.59	8.40
P-9	3.00	0	1,548	PVC	120.0	4.170	60.48	2.75	21.59	0.49	22.08
P-10	8.00	0	411	PVC	120.0	1.190	506.68	3.23	2.47	0.19	2.66
P-11	999.00	1	1	PVC	120.0	0.000	-28.35	0.00	0.00	0.00	0.00
P-12	2.00	18	18	PVC	120.0	7.270	28.35	2.89	0.44	0.95	1.39
P-13	2.00	0	1,132	HDPE	120.0	0.000	28.35	2.89	27.95	0.00	27.95
P-14	8.00	0	884	PVC	120.0	2.580	535.03	3.41	5.88	0.47	6.35
P-15	999.00	1	1	PVC	120.0	0.000	156.57	0.00	0.00	0.00	0.00
P-16	4.00	28	28	PVC	120.0	9.430	156.57	4.00	0.56	2.34	2.90
P-17	6.00	0	362	PVC	120.0	1.190	156.57	1.78	1.00	0.06	1.06
P-18	8.00	0	1,578	PVC	120.0	4.170	691.60	4.41	16.89	1.26	18.15
P-19	10.00	0	1,779	PVC	120.0	4.770	1,103.21	4.51	15.25	1.51	16.75
P-20	12.00	0	1,262	PVC	120.0	0.000	1,103.21	3.13	4.45	0.00	4.45
P-21	10.00	0	3,027	PVC	120.0	8.490	411.61	1.68	4.18	0.37	4.55
P-22	6.13	0	117	PVC	120.0	0.000	411.61	4.47	1.76	0.00	1.76
P-23	4.26	28	28	PVC	120.0	9.430	411.61	9.27	2.46	12.58	15.04
P-24	999.00	1	1	PVC	120.0	0.000	411.61	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 CONDITION)

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	171.84	60.48	113.24
LIFT STATION #1	Hydromatic Pump	65.40	65.40	135.55	411.61	70.15
TALICHET	TALICHET	62.50	62.50	136.31	156.57	73.81
TOWNHALL	TOWNHALL	73.50	73.50	168.04	28.35	94.54
VENEZIA #1	VENEZIA #1	65.00	65.00	166.27	209.52	101.27
VENEZIA #2	VENEZIA #2	55.50	55.50	164.32	236.68	108.82

Pump Definition Detailed Report: LAKESHORE (MANIFOLD CONDITION)

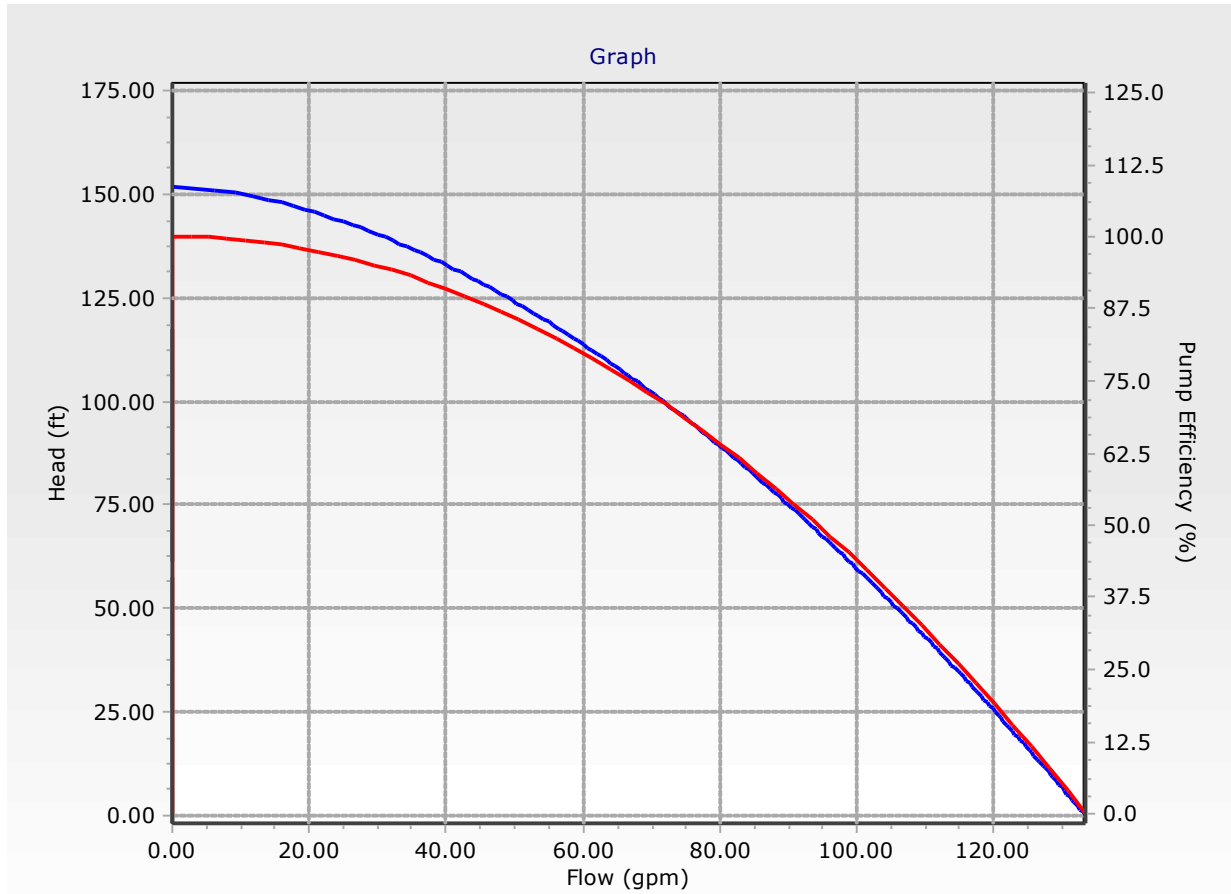
Element Details		
ID	173	Notes
Label	LAKESHORE	

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 CONDITION)



Pump Definition Detailed Report: TALICHET (MANIFOLD CONDITION)

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·ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: TALICHET (MANIFOLD CONDITION)



Pump Definition Detailed Report: TOWNHALL (MANIFOLD CONDITION)

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

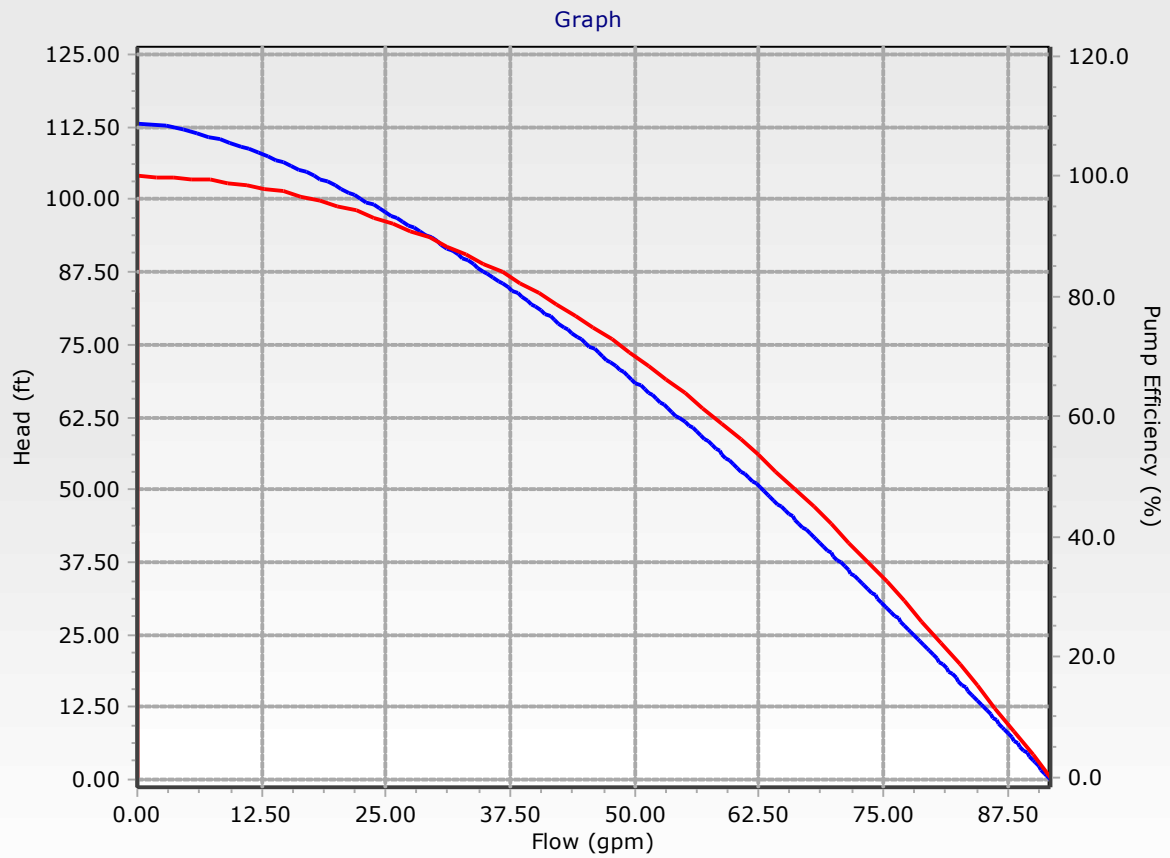
Pump Efficiency Type

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

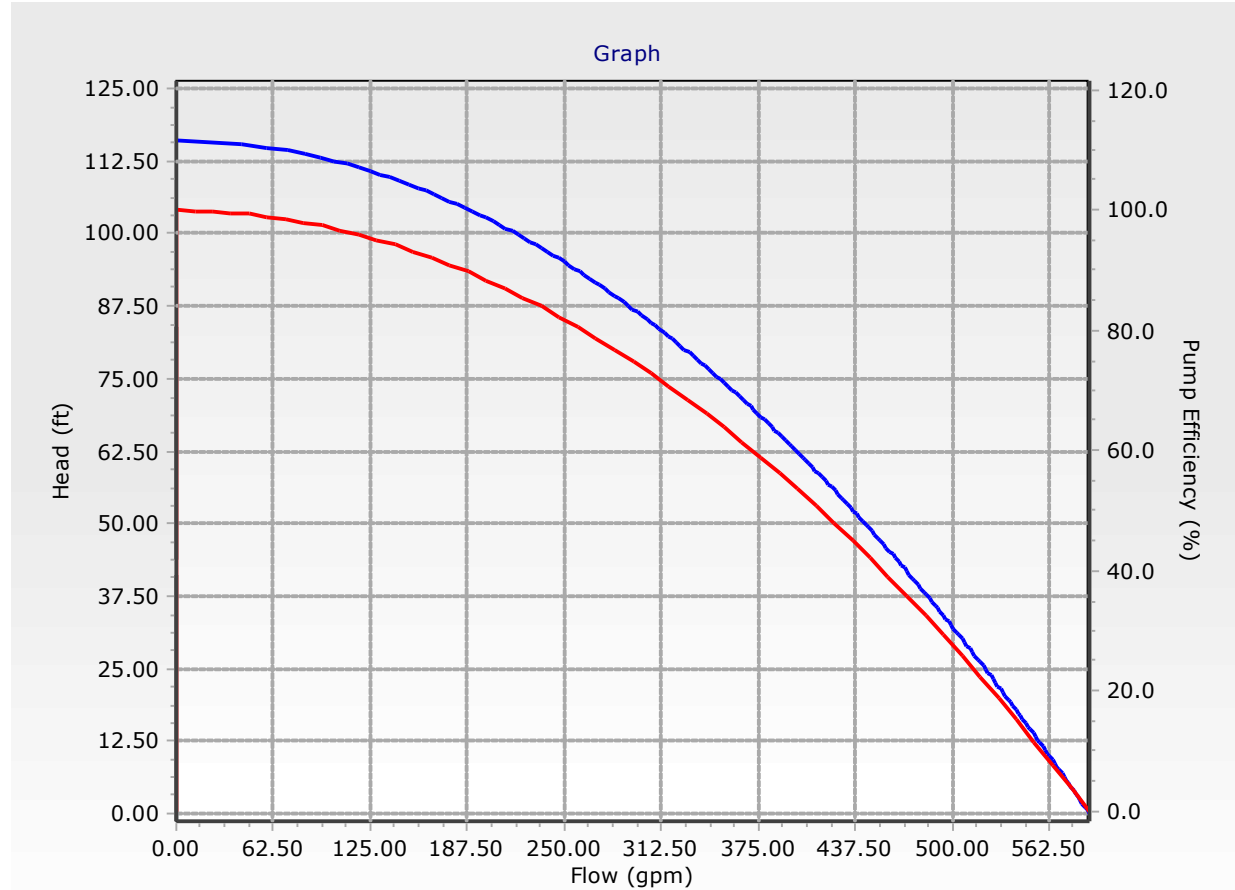
Pump Definition Detailed Report: TOWNHALL (MANIFOLD CONDITION)



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

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

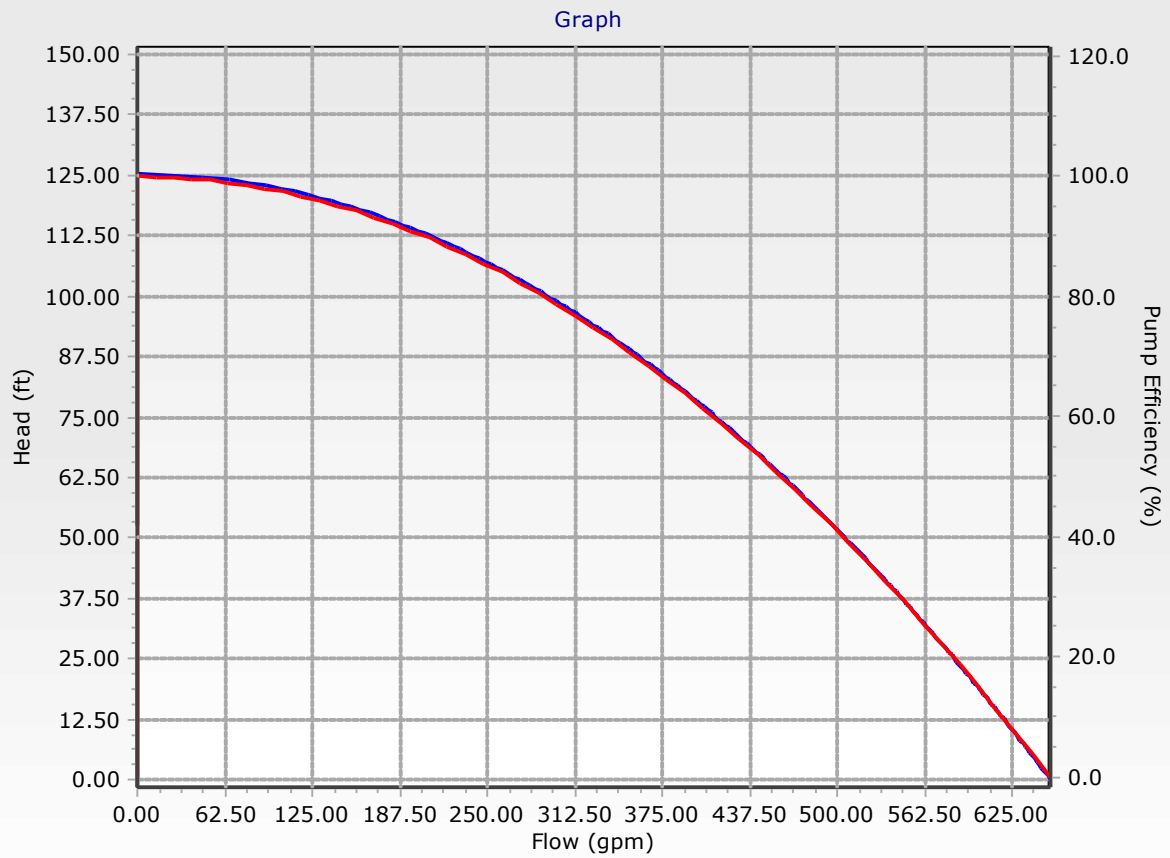
Pump Definition Detailed Report: VENEZIA #1 (MANIFOLD CONDITION)



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

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 CONDITION)



Pump Definition Detailed Report: Hydromatic Pump (MANIFOLD CONDITION)

Element Details		
ID	244	Notes
Label	Hydromatic Pump	

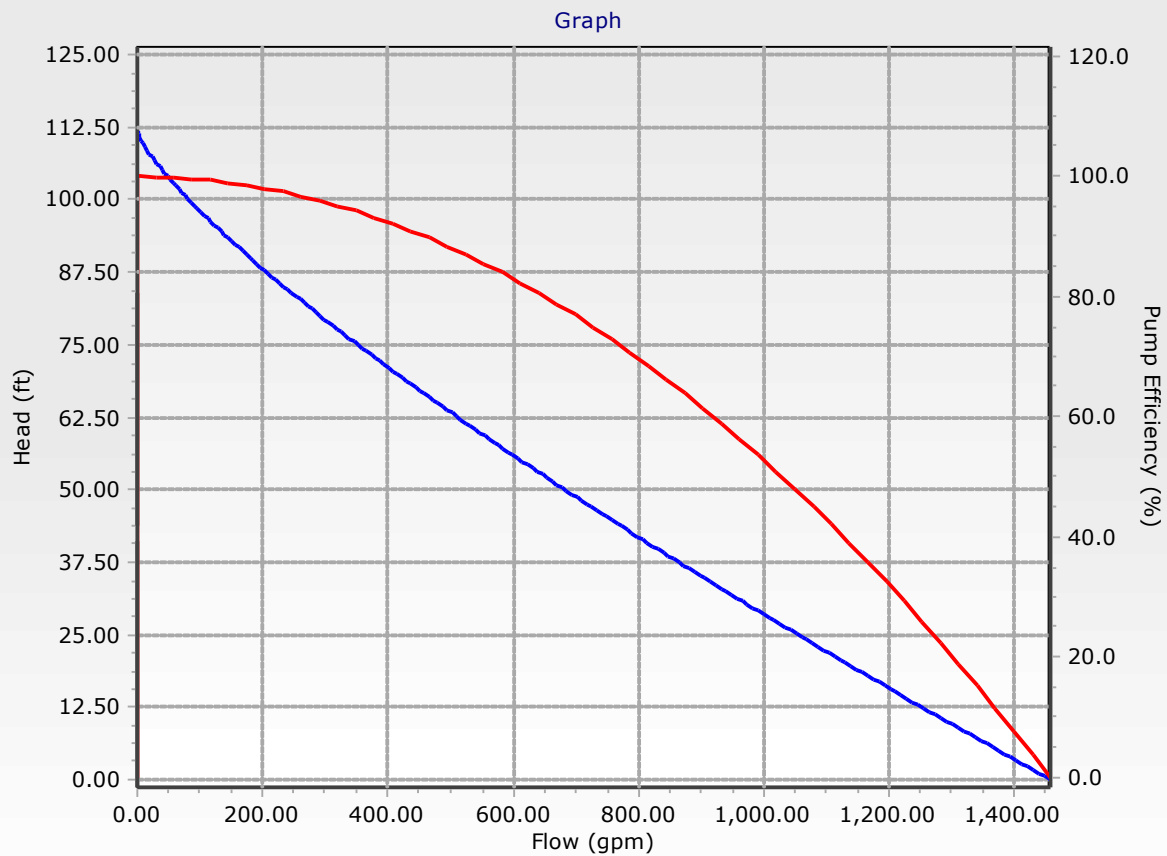
Pump Curve

Flow (gpm)	Head (ft)
0.00	112.00
50.00	105.00
100.00	98.00
150.00	92.00
200.00	87.00
250.00	82.00
300.00	78.00
350.00	75.00
400.00	73.00
450.00	67.00
500.00	64.00
550.00	61.00
600.00	58.00
650.00	52.00
700.00	49.00
750.00	45.00
800.00	41.00
850.00	37.00

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·ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Hydromatic Pump (MANIFOLD CONDITION)



FlexTable: Reservoir Table (MANIFOLD CONDITION)

Label	Elevation (ft)	Flow (Out net) (gpm)
R-1	65.00	209.52
R-2	55.50	236.68
R-3	58.60	60.48
R-4	73.50	28.35
R-5	62.50	156.57
R-6	93.00	-1,103.21
R-7	65.40	411.61

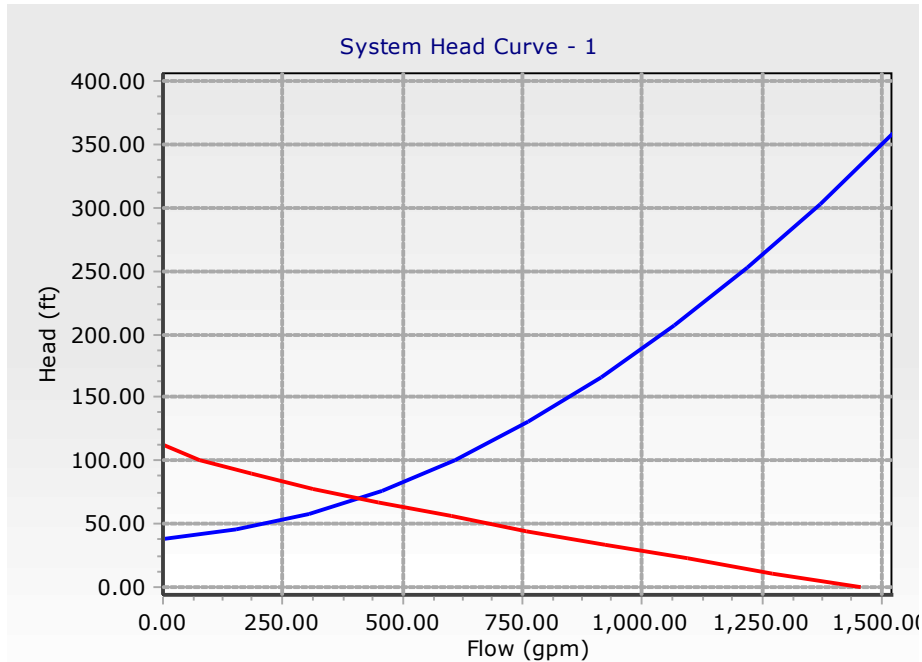
System Head Curve Detailed Report - System Head Curve - 1 (MANIFOLD CONDITION)

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)	Hydromatic Pump Flow (gpm)	Hydromatic Pump Head (ft)
0.00	38.24	1,457.21	0.00
152.40	44.89	1,273.24	11.18
304.79	57.70	1,094.93	22.37
457.19	76.31	922.78	33.55
609.59	100.58	757.43	44.73
761.99	130.38	599.68	55.91
914.38	165.63	450.59	67.10
1,066.78	206.24	311.70	78.28
1,219.18	252.13	185.43	89.46
1,371.57	303.23	76.31	100.64
1,523.97	359.46	0.00	111.83

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



FlexTable: Junction Table (RUNOUT CONDITION)

Label	Demand (gpm)	Elevation (ft)	Pressure (psi)	Pressure Head (ft)
J-1	0.00	90.94	51.6	119.37
J-2	0.00	97.50	48.8	112.81
J-3	0.00	84.12	54.6	126.19
J-4	0.00	66.10	62.4	144.21
J-5	0.00	96.25	49.3	114.06
J-6	0.00	81.00	55.9	129.31
J-7	0.00	87.75	53.0	122.56
J-8	0.00	80.50	56.2	129.81
J-9	0.00	84.50	54.4	125.81
J-10	0.00	84.00	6.0	13.83
J-11	0.00	85.00	3.9	9.02
J-12	0.00	85.90	9.1	20.95
J-13	0.00	87.50	7.3	16.84
J-14	0.00	86.10	7.9	18.24

FlexTable: Pipe Table (RUNOUT CONDITION)

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	498.64	2.04	3.50	0.31	3.81
P-20	12.00	0	1,262	PVC	120.0	0.000	498.64	1.41	1.02	0.00	1.02
P-21	10.00	0	3,027	PVC	120.0	8.490	498.64	2.04	5.96	0.55	6.51
P-22	6.13	0	117	PVC	120.0	0.000	498.64	5.42	2.51	0.00	2.51
P-23	4.26	28	28	PVC	120.0	9.430	498.64	11.22	3.50	18.46	21.97
P-24	999.00	1	1	PVC	120.0	0.000	498.64	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: Hydromatic Pump (RUNOUT CONDITION)

Element Details		
ID	244	Notes
Label	Hydromatic Pump	

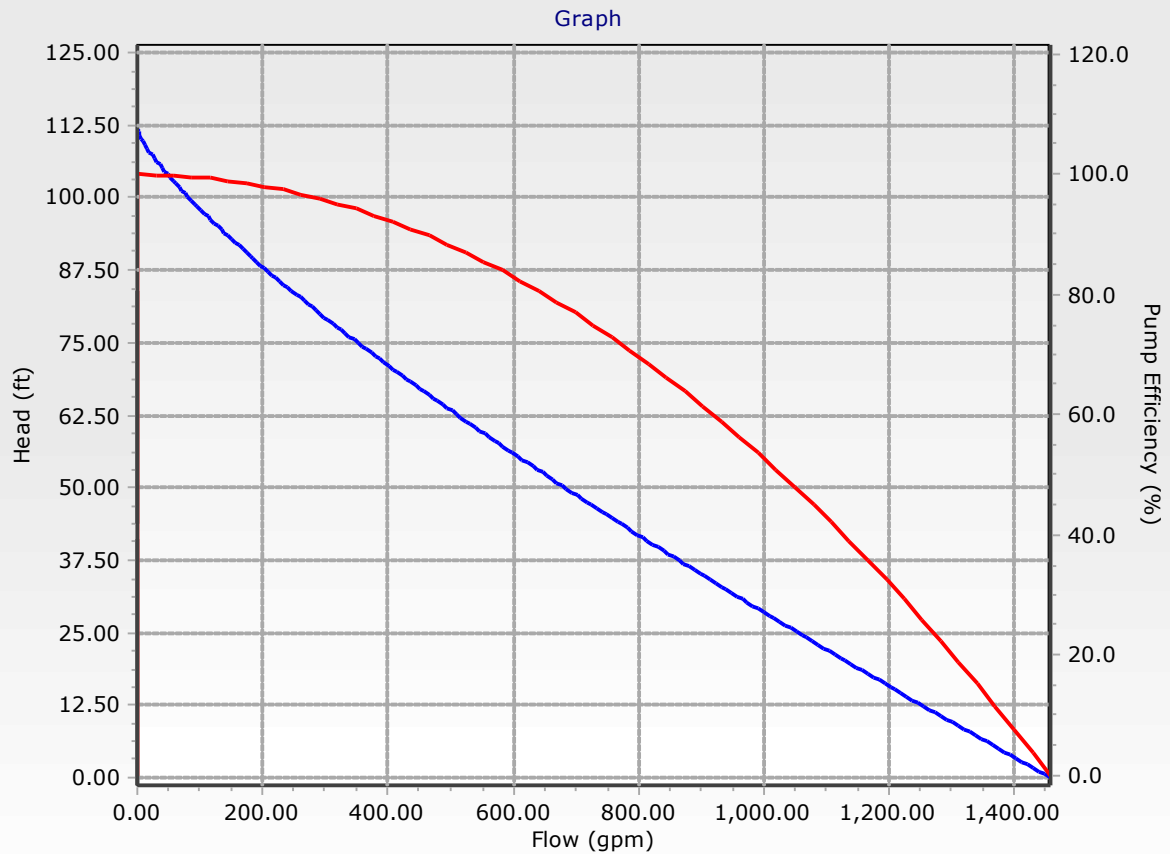
Pump Curve

Flow (gpm)	Head (ft)
0.00	112.00
50.00	105.00
100.00	98.00
150.00	92.00
200.00	87.00
250.00	82.00
300.00	78.00
350.00	75.00
400.00	73.00
450.00	67.00
500.00	64.00
550.00	61.00
600.00	58.00
650.00	52.00
700.00	49.00
750.00	45.00
800.00	41.00
850.00	37.00

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·ft ²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Hydromatic Pump (RUNOUT CONDITION)



FlexTable: Pump Table (RUNOUT CONDITION)

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	210.31	0.00	151.71
LIFT STATION #1	Hydromatic Pump	65.40	65.40	128.81	498.64	63.41
TALICHET	TALICHET	62.50	62.50	210.31	0.00	0.00
TOWNHALL	TOWNHALL	73.50	73.50	210.31	0.00	0.00
VENEZIA #1	VENEZIA #1	65.00	65.00	210.31	0.00	0.00
VENEZIA #2	VENEZIA #2	55.50	55.50	210.31	0.00	0.00

FlexTable: Reservoir Table (RUNOUT CONDITION)

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	-498.64
R-7	65.40	498.64

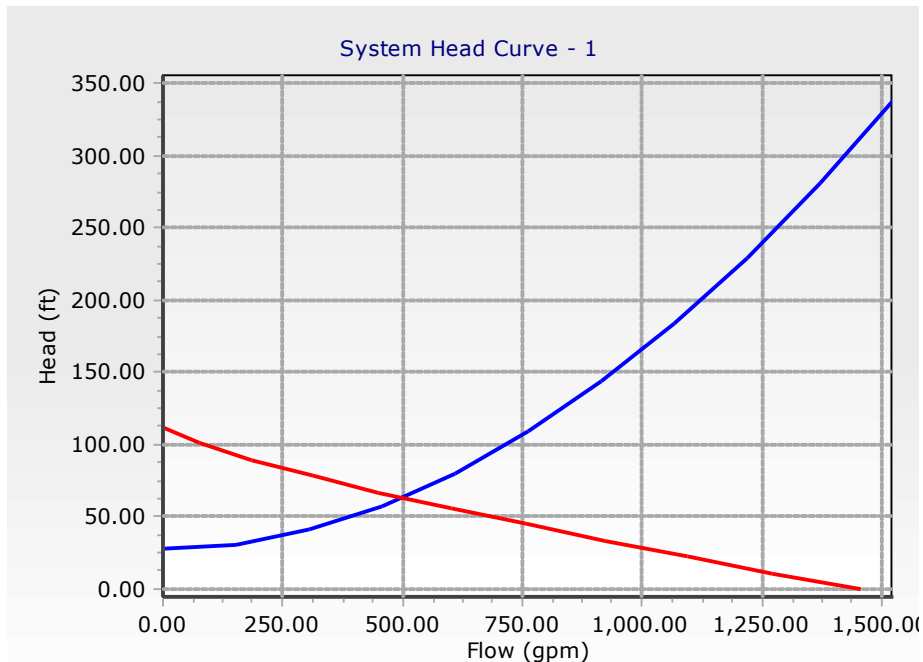
System Head Curve Detailed Report - System Head Curve - 1 (RUNOUT CONDITION)

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)	Hydromatic Pump Flow (gpm)	Hydromatic Pump Head (ft)
0.00	27.60	1,457.21	0.00
152.40	31.24	1,273.24	11.18
304.79	41.45	1,094.93	22.37
457.19	57.89	922.78	33.55
609.59	80.40	757.43	44.73
761.99	108.88	599.68	55.91
914.38	143.26	450.59	67.10
1,066.78	183.47	311.70	78.28
1,219.18	229.46	185.43	89.46
1,371.57	281.18	76.31	100.64
1,523.97	338.61	0.00	111.83

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



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

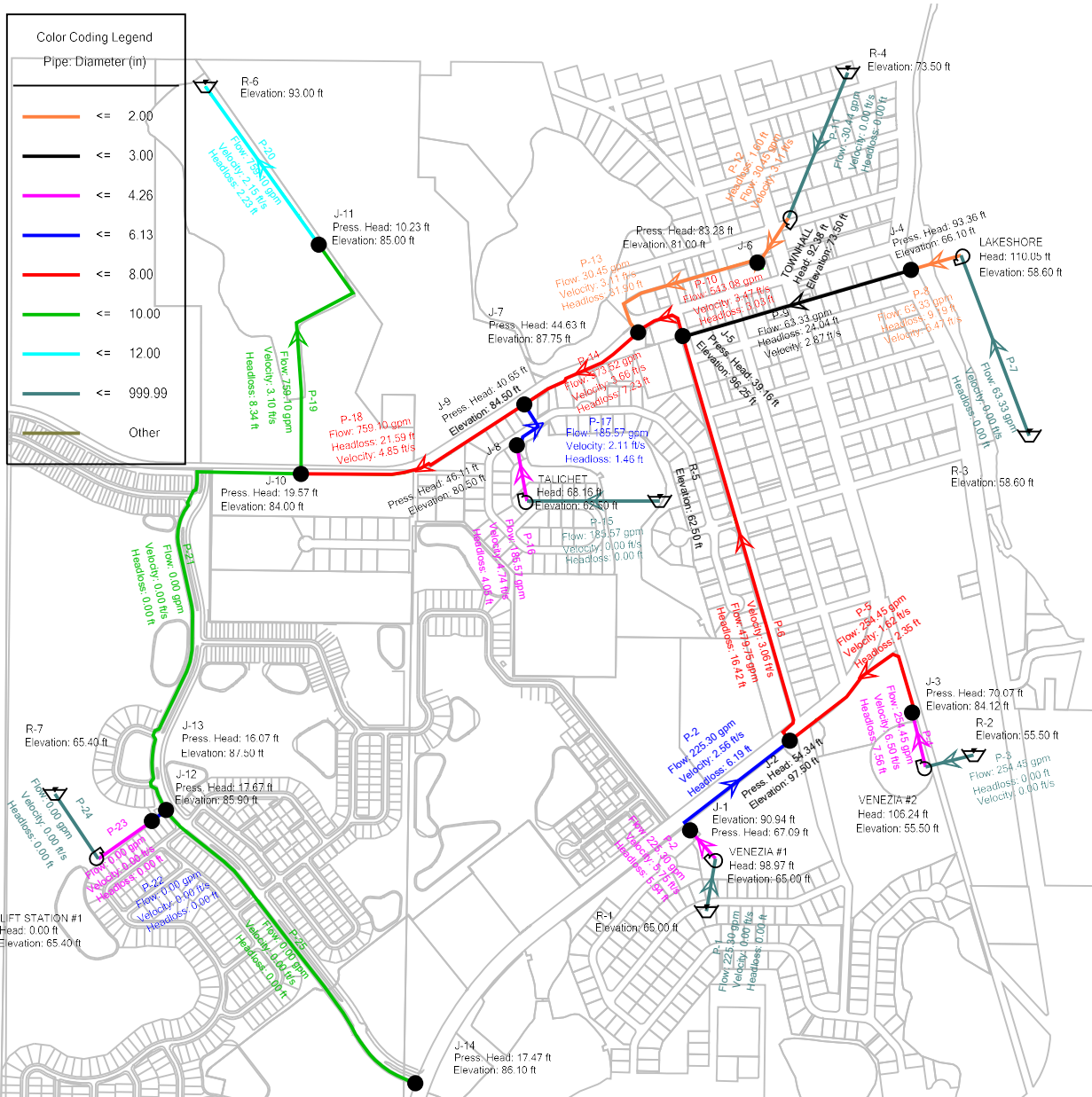
Pump Station Name	Required Peak Flow (GPM)	Peak Flow at Manifold Condition per Watercad Modeling (GPM)
Venezia Pump Station #1	133	210
* Data taken from Howey-In-The-Hills Wastewater Master Plan dated October 2018		
Venezia Pump Station #2	204	237
* Data taken from Howey-In-The-Hills Wastewater Master Plan dated October 2018		
Talichet Pump Station	72	157
* 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	412	499

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

Item Number / Tags	: 001	Size	: Hydromatic - H4H
Service	:	Stages	: 1
Quantity	: 1	Based on curve number	: SUB_S_E_AH_00021_B_4 Rev
Quote number	: 917608		2012-03-23
		Date last saved	: 24 Oct 2022 7:20 AM

Operating Conditions

Flow, rated	: 400.0 USgpm
Differential head / pressure, rated (requested)	: 72.00 ft
Differential head / pressure, rated (actual)	: 73.95 ft
Suction pressure, rated / max	: 0.00 / 0.00 psi.g
NPSH available, rated	: Ample
Site Supply Frequency	: 60 Hz

Performance

Speed criteria	: Synchronous
Speed, rated	: 1750 rpm
Impeller diameter, rated	: 9.75 in
Impeller diameter, maximum	: 10.00 in
Impeller diameter, minimum	: 8.00 in
Efficiency	: 66.38 %
NPSH required / margin required	: - / 0.00 ft
nq (imp. eye flow) / S (imp. eye flow)	: 34 / - Metric units
Minimum Continuous Stable Flow	: 100.0 USgpm
Head, maximum, rated diameter	: 113.3 ft
Head rise to shutoff	: 57.09 %
Flow, best eff. point	: 539.1 USgpm
Flow ratio, rated / BEP	: 74.19 %
Diameter ratio (rated / max)	: 97.50 %
Head ratio (rated dia / max dia)	: 90.85 %
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00
Selection status	: Acceptable

Liquid

Liquid type	: Water
Additional liquid description	:
Solids diameter, max	: 0.00 in
Solids diameter limit	: 3.00 in
Solids concentration, by volume	: 0.00 %
Temperature, max	: 68.00 deg F
Fluid density, rated / max	: 1.000 / 1.000 SG
Viscosity, rated	: 1.00 cP
Vapor pressure, rated	: 0.34 psi.a

Material

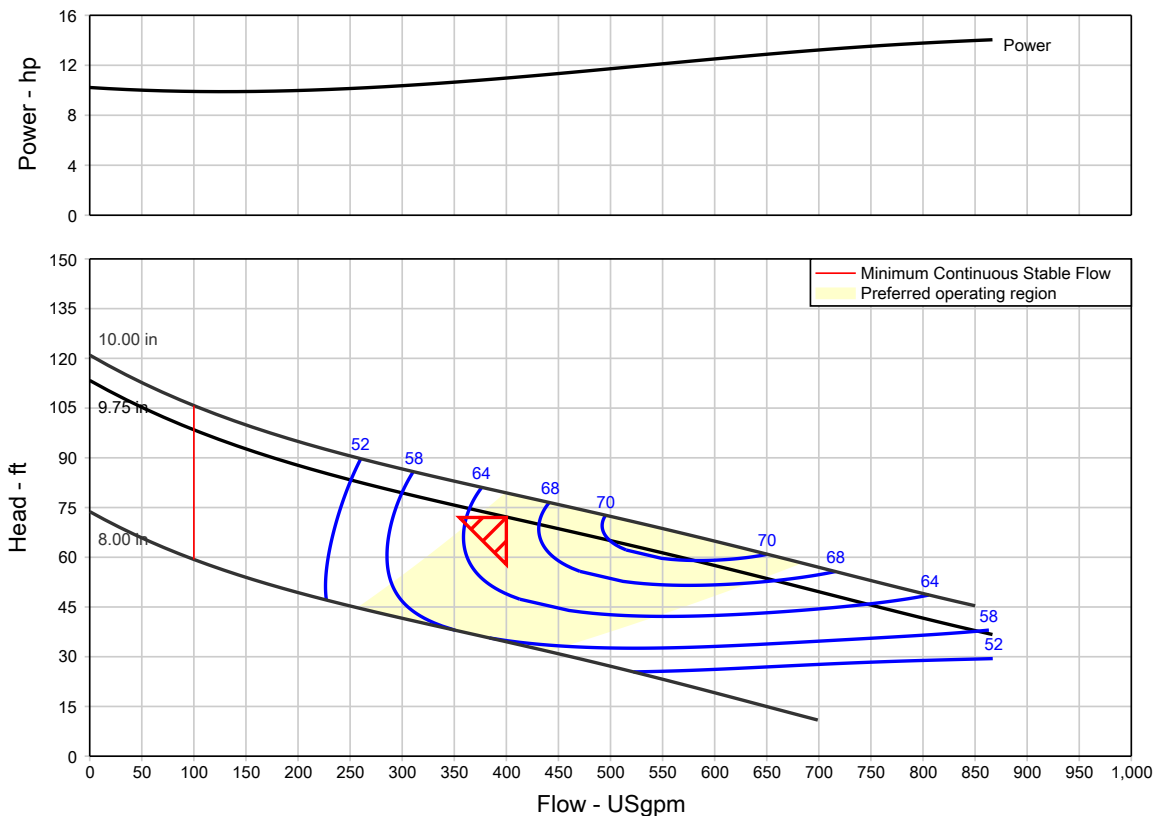
Material selected	: Standard
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Pressure Data

Maximum working pressure	: 49.06 psi.g
Maximum allowable working pressure	: N/A
Maximum allowable suction pressure	: N/A
Hydrostatic test pressure	: N/A

Driver & Power Data (@Max density)

Driver sizing specification	: Rated power
Margin over specification	: 0.00 %
Service factor	: 1.00
Power, hydraulic	: 7.29 hp
Power, rated	: 10.98 hp
Power, maximum, rated diameter	: 14.04 hp
Minimum recommended motor rating	: 15.00 hp / 11.19 kW



MODEL: H4H(X) — Solids Handling Sewage Pumps

Physical Data:

DISCHARGE SIZE	4" 125# ANSI
IMPELLER TYPE	BALANCED, ENCLOSED, MONO-VANE
CABLE LENGTH	35' STANDARD 50' OPTIONAL

Liquid Handling:

SOLIDS SIZE	3" SPHERICAL
MAXIMUM LIQUID TEMP.	140°F
ACCEPTABLE PH RANGE	6 - 9
SPECIFIC GRAVITY	0.9 - 1.1
VISCOSITY	28 - 35 SSU

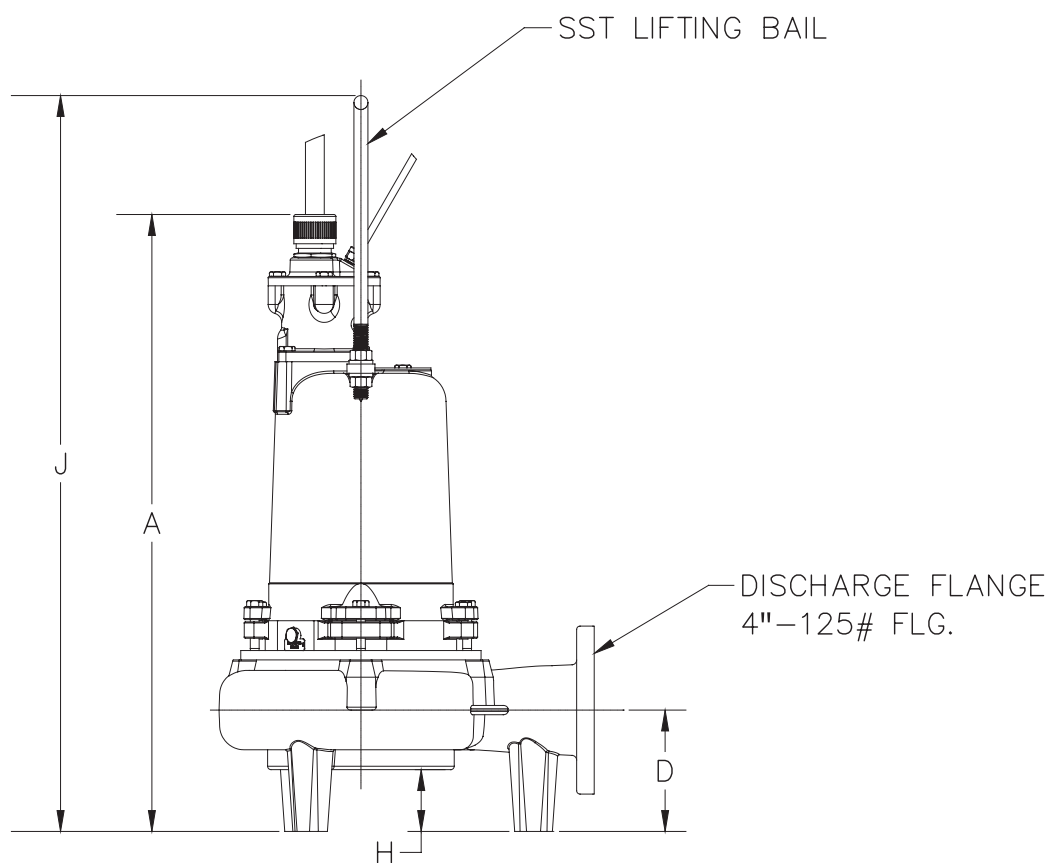
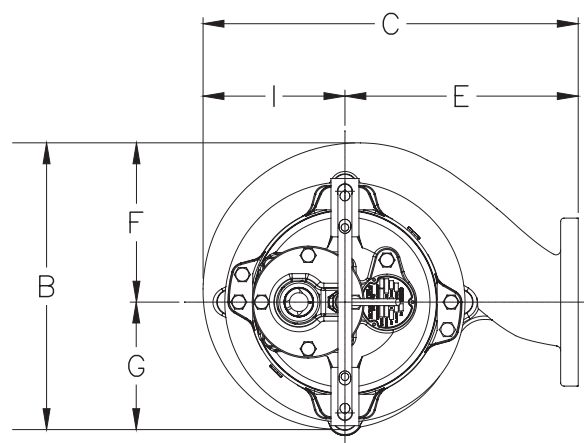
Temperature:

MAXIMUM STATOR	356°F
OIL FLASH POINT	390°F
HEAT SENSOR	Open: 257°F MAX./239°F MIN. Closed: 194°F MAX./119°F MIN.

Technical Data:

POWER CORD TYPE		SOOW, W			
SENSOR CORD TYPE		SOOW			
MATERIALS OF CONSTRUCTION	MOTOR HOUSING	CAST IRON	ASTM	A-48	CLASS 30
	CASING	CAST IRON	ASTM	A-48	CLASS 30
	IMPELLER	DUCTILE IRON	ASTM	A-536	
	CASING WEAR RING	BRONZE	ASTM	B-584-836	ALLOY 115
	MOTOR SHAFT	416 STAINLESS STEEL			
	HARDWARE	300 SERIES STAINLESS STEEL			
	"O" RINGS	NITRILE			
MECHANICAL SEALS					
	Standard:	UPPER AND LOWER CARBON/CERAMIC/NITRILE, TYPE 21			
	Optional:	LOWER TUNGSTEN CARBIDE/TUNGSTEN CARBIDE/NITRILE, TYPE 21			
	Optional:	LOWER SILICON CARBIDE/SILICON CARBIDE/NITRILE, TYPE 21			
UPPER BEARING		(RADIAL) SINGLE ROW — BALL			
LOWER BEARING		(THRUST) SINGLE ROW — BALL			

Dimensional Data – H4H/H4HX



	A	B	C	D	E	F	G	H	I	J
H4H	33	15-5/8	20-3/16	6-1/2	12-1/2	8-13/16	7-11/16	3-3/16	8-1/4	39-7/16
H4HX	39-1/4	15-5/8	20-3/16	6-1/2	12-1/2	8-13/16	7-11/16	3-3/16	8-1/4	50-7/8

ALL DIMENSIONS IN INCHES
NOTE: CASTING DIMENSIONS MAY VARY $\pm 1/8$ "

Electrical Data – H4H/H4HX

MODEL: H4H/H4HX– Solids Handling Sewage Pump

R.P.M.	1750			
MOTOR TYPE	ENCLOSED, OIL COOLED INDUCTION, VFD SUITABLE			
MOTOR DESIGN NEMA TYPE	B(3Ø) L(1Ø)			
GENERAL INSULATION CLASS	H			
STATOR WINDING CLASS	H			
MAXIMUM STATOR TEMPERATURE	356°F (180°C)			
MOTOR PROTECTION	BI-METALLIC, TEMPERATURE SENSITIVE DISC, SIZED TO OPEN AT 130°C AND AUTOMATICALLY RESET @ 96-68°C DIFFERENTIAL, ONE IN SINGLE PHASE, TWO IN THREE PHASE			
ELECTRICAL RATINGS	HEAT SENSOR	24VDC 5AMPS	115VAC 5AMPS	230VAC 5AMPS
	SEAL FAIL	300VAC 5mA		
VOLTAGE TOLERANCE	±10%			

HP	VOLTAGE	PHASE	NEC CODE	SF	FULL LOAD AMPS	SF AMPS	LOCKED ROTOR AMPS	RUN KW	START KVA	RUN KVA	MTR. EFF. @ SF	MTR. EFF. 100% FL	MTR. EFF. 75% FL	MTR. EFF. 50% FL	PWR. FACT. @ SF	PWR. FACT. 100% FL	PWR. FACT. 75% FL	PWR. FACT. 50% FL
7.5	230	1	D	1.2	37	45	137	7.3	31.5	7.4	.77	.77	.75	.67	.98	.98	.97	.92
7.5	200	3	H	1.2	25.2	29.5	147	7.0	51	8.8	.80	.80	.79	.73	.82	.80	.76	.66
	230				21.9	25.7	128											
	460				11	12.8	64											
	575				8.8	10.3	51.2											
10	200	3	H	1.2	33.9	39.9	186	9.3	64.5	11.7	.80	.81	.79	.75	.81	.79	.75	.66
	230				29.5	34.7	162											
	460				14.7	17.3	81											
	575				11.8	13.9	65											
15	200	3	G	1.2	50.8	60.9	267	13.7	92.5	17.6	.80	.82	.81	.79	.80	.78	.71	.60
	230				44.2	53	232											
	460				22.1	26.5	116											
	575				17.7	21.2	92.8											

Specifications – Solids Handling

4" SOLIDS HANDLING SUBMERSIBLE SEWAGE PUMPS

GENERAL

Contractor shall furnish all labor, materials, equipment and incidentals required to provide 2 solids handling submersible centrifugal sewage pump(s) as specified herein.

OPERATING CONDITIONS

Each pump shall be rated 15 HP, 230 volts, 3 phase, 60 hertz, and 1750 RPM. The unit shall produce 400 U.S. GPM at 68.70 feet TDH, with a minimum pump efficiency of 66.38 % and maximum input kW of 13.7 kW. The pump shall be capable of handling a 3" solid. The pump shall be non-overloading throughout the entire range of operation without employing service factor. The pump shall reserve a minimum service factor of 1.20. The performance curve submitted for approval shall state in addition to head and capacity performance, the pump efficiency, solid handling capacity, and reflect motor service factor.

CONSTRUCTION

The pump shall be a centrifugal, solids handling, submersible, wastewater type, model 4H4(X) as manufactured by Hydromatic Pump. The pump volute, motor and seal housing shall be high quality gray cast iron, ASTM A-48, Class 30. The pump discharge shall be fitted with a 4" standard ASA 125 lb. flange, faced and drilled. All external mating parts shall be machined and Nitrile O-ring sealed on a beveled edge. Gaskets shall not be acceptable. All fasteners exposed to the pumped liquids shall be 300 series stainless steel.

ELECTRICAL POWER CORD

Electrical power cord shall be SOOW, W, or GGC, water resistant 600V, 90°C, UL and CSA approved and applied dependent on amp draw for size.

The pump shall be triple protected with a compression fitting and two epoxy potted areas at the power cord entry to the pump. A separation between the junction box area of the pump and the motor by a stator lead sealing gland or terminal board shall not be acceptable.

The power cable entry into the cord cap assembly shall first be made with a compression fitting. Each individual lead shall be stripped down to bare wire at staggered intervals, and each strand shall be individually separated. This area of the cord cap shall then be filled with an epoxy compound potting which will prevent water contamination to gain entry even in the event of wicking or capillary action.

The power cord leads shall then be connected to the motor leads with extra heavy connectors having brass inserts with a screwed wire-to-wire connection, rather than a terminal board that allows for possible leaks.

The connection box wiring shall be separated from the motor housing wiring by stripping each lead down to bare wire, at staggered intervals, and separating each strand. This area shall be filled with an epoxy compound potting. Fiberglass terminal boards, which are subject to heat fatigue and cracking and which may lead to possible leaks, shall not be acceptable.

The cord cap assembly where bolted to the connection box assembly and the connection box assembly where bolted to the motor housing shall each be sealed with a Nitrile O-ring on a beveled edge to assure proper sealing.

MOTOR

The stator, rotor and bearings shall be mounted in a sealed submersible type housing. The stator windings shall have Class F insulation (155°C or 311°F) or Class H insulation (180°C or 356°F) and a dielectric oil-filled motor, NEMA B design. Further protection shall be provided by using on-winding thermal sensors. Because air-filled motors do not dissipate heat as efficiently as oil-filled motors, air-filled designs shall not be acceptable.

The pump and motor shall be specifically designed so that they may be operated partially or completely submerged in the liquid being pumped. The pump shall not require cooling water jackets. Dependence upon, or use of, water jackets for supplemental cooling shall not be acceptable.

Stators shall be securely held in place with a removable end ring and threaded fasteners so they may be easily removed. No special tools shall be required for pump and motor disassembly.

Pump shall be equipped with heat sensors. The heat sensor shall be a low resistance, bi-metal disc that is temperature sensitive. It shall be mounted directly on the stator windings and sized to open at 120°C and automatically reset at 30–35°C differential. The sensors shall be connected in series with motor starter coil so that the starter shall be equipped with 3 leg overload heaters, making all normal overloads protected by the starter.

BEARINGS AND SHAFT

An upper radial bearing and a lower thrust bearing shall be required. These shall be heavy-duty single row ball bearings that are permanently lubricated by the dielectric oil that fills the motor housing. Double row, sealed grease packed bearings shall not be acceptable. Bearings that require lubrication according to a prescribed schedule shall not be acceptable. The upper radial bearing and lower thrust bearing shall have a minimum B-10 life of 50,000 hours.

The shaft shall be machined from a solid 400 series stainless steel forging and be a design that is of large diameter with minimum overhang to reduce shaft deflection and prolong bearing life.

SEALS

The pump shall have two mechanical seals, mounted in tandem, with an oil chamber between the seals. Type 21 seals shall be used with the rotating seal faces being carbon and the stationary seal faces to be ceramic. The lower seal shall be replaceable without disassembly of the seal chamber and without the use of special tools. Pump-out vanes shall be present on the backside of the impeller to keep contaminants out of the seal area. Units that require the use of tungsten-carbide seals or foreign manufactured seals shall not be acceptable.

The pump shall be equipped with a seal leak detection probe and warning system. This shall be designed to alert maintenance personnel of lower seal failure without having to take the unit out of service for inspection or requiring access for checking seal chamber oil level and consistency.

There shall be an electric probe or seal failure sensor installed in the seal chamber between the two tandem mechanical seals. If the lower seal fails, contaminants that enter the seal chamber shall be detected by the sensor, which sends a signal to operate the specified warning device.

Units equipped with opposed mechanical seals shall not be acceptable.

IMPELLER

Impeller shall be of the mono-vane or two-vane, enclosed solids handling design and have pump-out vanes on the front and backside of the impeller to prevent grit and other materials from collecting in the seal area. Impeller shall not require coating. Because most impeller coatings do not remain beyond the very early life of the impeller, efficiency and other performance data submitted shall be based on performance with an uncoated impeller. Attempts to improve efficiency by coating impeller shall not be acceptable.

Impellers shall be dynamically balanced. The tolerance values shall be listed below according to the International Standard Organization grade 6.3 for rotors in rigid frames. The tolerance is to be split equally between the two balance planes that are the two impeller shrouds.

RPM	Tolerance
3500	.01 in. – oz./lb. of impeller weight
1750	.02 in. – oz./lb. of impeller weight
1150	.026 in. – oz./lb. of impeller weight
870	.03 in. – oz./lb. of impeller weight

The impeller shall be threaded shaft or tapered shaft and key driven. A 300 series stainless steel washer and impeller bolt shall be used to secure the impeller to the shaft for both threaded and tapered shafts. Straight end shafts for attachment of the impeller shall not be acceptable.

CASING

The casing shall be of the end suction volute type having sufficient strength and thickness to withstand all stress and strain from service at full operating pressure and load. The casing shall be of the centerline discharge type equipped with an automatic pipe coupling arrangement for ease of installation and piping alignment. The design shall be such that the pumps will be automatically connected to the discharge piping when lowered into position with the guide rails. The casing shall be accurately machined and bored for register fits with the suction and casing covers.

A volute case wear ring shall be provided to minimize impeller wear. The wear ring shall be 85-5-5 red brass or 80-10-10 bronze, ASTM-B43 and held by 300 series stainless steel fasteners. The wear ring shall be easily replaceable in the field. Wear rings of any other material shall not be acceptable.

SERVICEABILITY

The complete rotating assembly shall be capable of being removed from the volute without disturbing the suction piping, discharge piping, and volute. The motor housing, seal housing with seal plate and impeller still attached to the shaft shall be capable of being lifted out of the volute case from the top as one assembly.

SUPPORT

Though the pump may not require feet to support the unit while installed, the pump volute must have feet to support the unit when removed for service. Units that do not have feet upon which the unit can be supported when removed for service shall not be acceptable.

TESTING

Commercial testing shall be required and include the following:

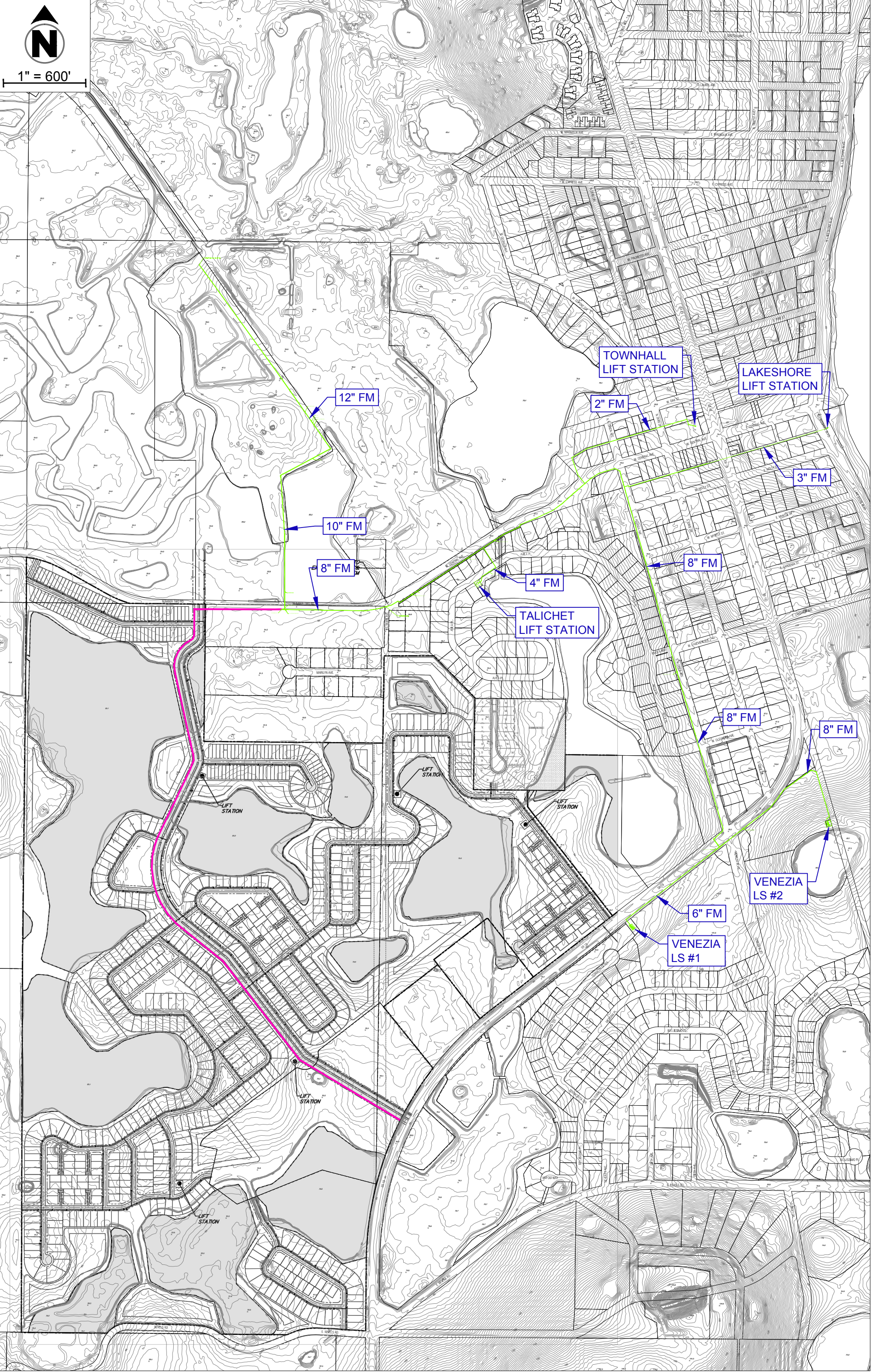
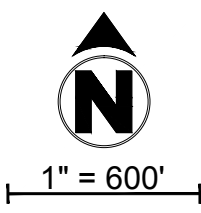
- The pump shall be visually inspected to confirm that it is built in accordance with the specification as to HP, voltage, phase and hertz.
- The motor seal and housing chambers shall be meggered for infinity to test for moisture content or insulation defects.
- Pump shall be allowed to run dry to check for proper rotation.
- Discharge piping shall be attached, the pump submerged in water, and amp readings shall be taken in each leg to check for an imbalanced stator winding. If there is a significant difference in readings, the stator windings shall be checked with a bridge to determine if an unbalanced resistance exists. If so, the stator shall be replaced.
- The pump shall be removed from the water, meggered again, dried and the motor housing filled with dielectric oil.

Optional testing available: Megger Test, Hydrostatic Test, Non-Witnessed Hydraulic Institute Performance Test.

PAINT

The pump shall be painted with waterborne hybrid acrylic/alkyd paint. This custom engineered, quick dry paint shall provide superior levels of corrosion and chemical protection.

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WASTEWATER MASTER PLAN

Town of Howey in the Hills Public Wastewater System

Prepared For:



Prepared By:



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
Design Peaking Factors:							F _{min}	F _{max}	F _{peak}
							0.5	2.0	4.0

II. Wet Well Dimensions:

<u>Wet Well Configuration:</u>	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 Triplex 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
Freeboard =	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.
<u>Ground Water Table @ Elevation</u>	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

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. = 66.00 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 = 193 gpm (Peak)

Outflow = 294 gpm

	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.	Total	No.	Total	No.	Total	No.	Total	No.	Total
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	0.0
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

Step Interval = 25 gpm Add. Manifold Flows (gpm): $\frac{6}{0}$ $\frac{8}{0}$ $\frac{10}{0}$ $\frac{12}{0}$

		Pipe & Fitting Friction Losses in Feet - Velocity in Feet per Second															Friction Head (feet)	TDH (feet)
Q (gpm)		Pipe (ft)	6 Fittings (ft)	Velocity (fps)	Pipe (ft)	6 Fittings (ft)	Velocity (fps)	Pipe (ft)	8 Fittings (ft)	Velocity (fps)	Pipe (ft)	10 Fittings (ft)	Velocity (fps)	Pipe (ft)	12 Fittings (ft)	Velocity (fps)		
0	0.00	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	0.0	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	0.0	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	0
5				0	0	0	0	0	0
6				0	0	0	0	0	0
7				0	0	0	0	0	0
8				0	0	0	0	0	0
9				0	0	0	0	0	0
10				0	0	0	0	0	0
Total					73,302	51	25	102	204
Design Peaking Factors:							F _{min}	F _{max}	F _{peak}
							0.5	2.0	4.0

II. Wet Well Dimensions:

<u>Wet Well Configuration:</u>		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:

$T = (V / (Q - S)) + (V / S)$		Where: T = Cycle Time (Min.)
Note: T_{min} occurs when $S = 1/2Q$ (Duplex)		S = Peak Inflow (gpm)
$V = (QT / 4)$		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 Triplex 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
4 TH Pump & Alarm Light ON Elev.	0.00
Freeboard =	0.00 Feet
3 RD Pump & Alarm Light ON Elev.	0.00
Freeboard =	0.00 Feet
2 ND Pump & Alarm Light ON Elev.	60.00
Freeboard =	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	

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
 OF 2 Pumps = gpm @ ft TDH
 OP 3 pumps = gpm @ ft TDH

		Station Piping		Force Main Piping								
		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 sq 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 8 10 12
 0 0 0 0

System Head Curve	Pipe & Fitting Friction Losses in Feet - Velocity in Feet per Second																	
	Q (gpm)	6			8			8			10			12			Friction Head (feet)	TDH (feet)
		Pipe (ft)	Fittings (ft)	Velocity (fps)	Pipe (ft)	Fittings (ft)	Velocity (fps)	Pipe (ft)	Fittings (ft)	Velocity (fps)	Pipe (ft)	Fittings (ft)	Velocity (fps)	Pipe (ft)	Fittings (ft)	Velocity (fps)		
	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	
350	0.77	1.57	4.0	3.92	0.30	2.2	17.16	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	4.6	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:

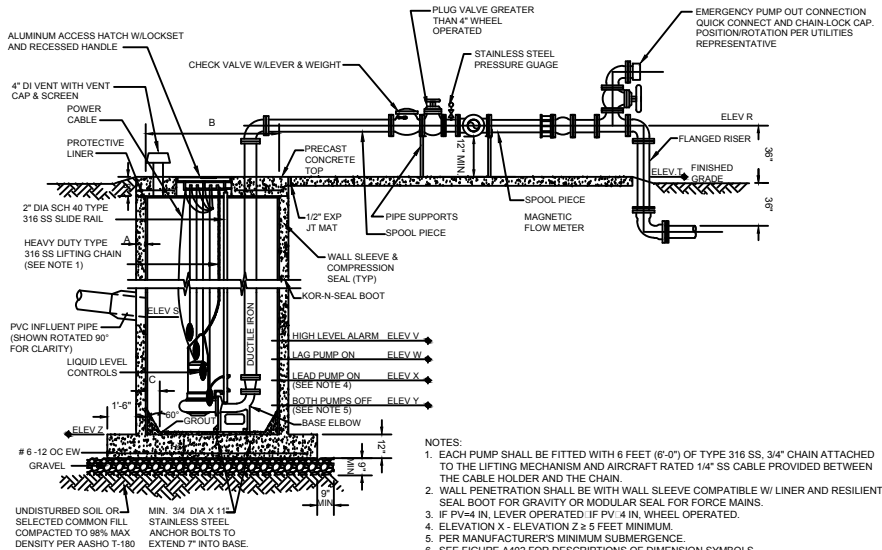
- A MICROPROCESSOR-BASED PUMP CONTROLLER/TRANSCIEVER (CC) MODEL SIEMENS WATER TECHNOLOGIES LC-150 SHALL BE PROVIDED.
- THE RTU SHALL BE MOUNTED IN A NEMA 3R 316 STAINLESS STEEL ENCLOSURE ADJACENT TO THE PUMP CONTROL PANEL AND SHALL BE PROVIDED WITH A CLASS II UL LISTED TRANSFORMER/POWER SUPPLY.
- STANDARDS:
 - FCC PART 15, SUBPART J, CLASS A - RADIO EMISSIONS
 - ANSI/IEEE C37.90 - SURGE WITHSTAND CAPABILITY
 - ANSI/IPC-S815A - QUALITY CONTROL
- APPROVED SYSTEM SUPPLIER IS SIEMENS WATER TECHNOLOGIES. CONTACT RON ROBINETTE 800-247-0880.

GENERAL NOTES:

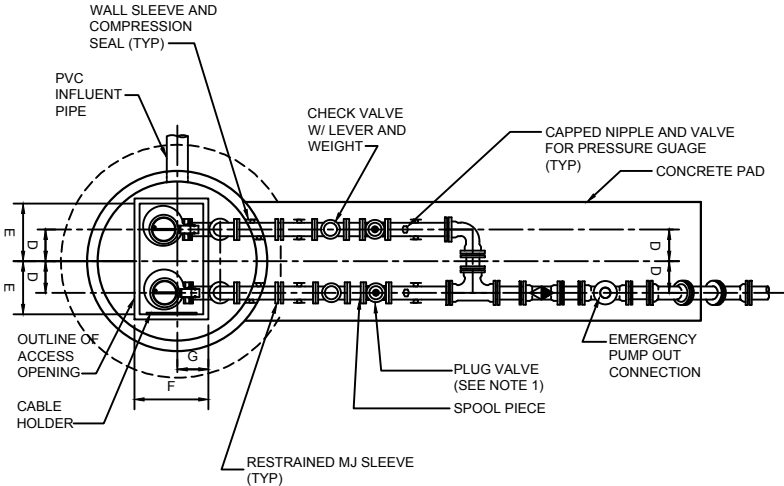
- COATING SHALL BE AS SCHEDULED IN TABLE BELOW.
- ALL LOCATIONS WHERE GRAVITY PIPES ENTER OR LEAVE THE WET WELL SHALL BE MADE WATERTIGHT WITH AN APPROVED BOOT.
- ALL LOCATIONS WHERE PRESSURE PIPES ENTER THE WET WELL SHALL BE MADE WATERTIGHT WITH A WALL SLEEVE AND SEAL.
- THERE SHALL BE NO VALVES OR ELECTRICAL JUNCTION BOXES IN THE WET WELL.
- WET WELL COVERS SHALL BE ALUMINUM WITH 316 STAINLESS STEEL HARDWARE WITH LOCK BRACKET.
- ALL HARDWARE IN WET WELL SHALL BE 316 STAINLESS STEEL.
- PUMP SUBMERGENCE REQUIREMENTS SHALL BE MET AS MINIMUM.
- 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.
- 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
Outside Wet Well	Standard Coating System	Consult CS-S5
Inside Wet Well	Waterproofing System	See PG 1000-1000
Finished Bottom of Wet Well	100% Solid Epoxy Coating	Minimum 2 mils thick
Wet Well Piping	Double End Pipe Coating and Liner (or 100% Solid Epoxy Coating)	Protect 401 Corrosion Epoxy
Electric Motor Enclosure	Protective Finish Anti-Pollution (Food Grade) and Pollution Resistant	Temperature: 37-77 H Cooled-Protection: 200-250 F

PUMP STATION GENERAL NOTES



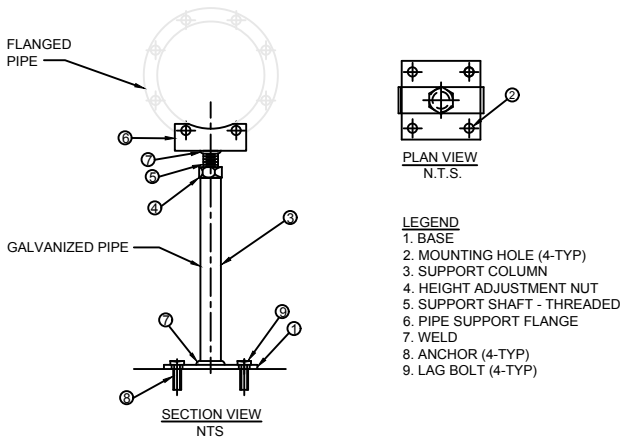
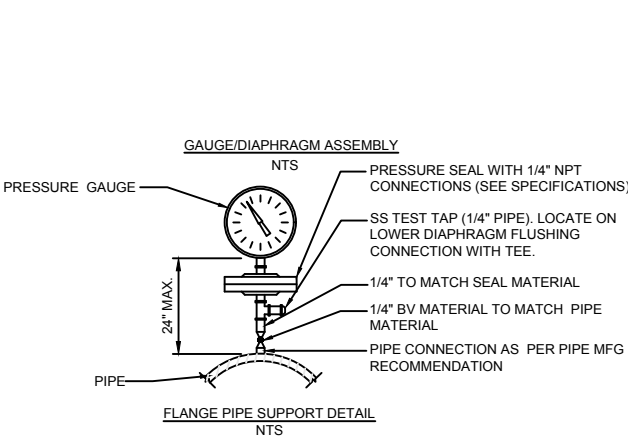
- NOTES:
- EACH PUMP SHALL BE FITTED WITH 6 FEET (8'-0") OF TYPE 316 SS, 3/4" CHAIN ATTACHED TO THE LIFTING MECHANISM AND AIRCRAFT RATED 1/4" SS CABLE PROVIDED BETWEEN THE CABLE HOLDER AND THE CHAIN.
 - WALL PENETRATION SHALL BE WITH WALL SLEEVE COMPATIBLE W/ LINER AND RESILIENT SEAL BOOT FOR GRAVITY OR MODULAR SEAL FOR FORCE MAINS.
 - IF PV=4 IN, LEVER OPERATED; IF PV=4 IN, WHEEL OPERATED.
 - ELEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM.
 - PER MANUFACTURER'S MINIMUM SUBMERGENCE.
 - SEE FIGURE A402 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
 - INSIDE OF WETWELL TO BE LINED WITH SUPERCAT PG.



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

DUPLEX PUMP STATION PLAN

FIGURE A404-2



- NOTE:
- 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.

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.

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	—	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	—	63.33'

- NOTE:
- PER PUMP MANUFACTURER'S REQUIREMENTS
 - ELEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM
 - 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

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	—	82.12'
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	—	54.29'

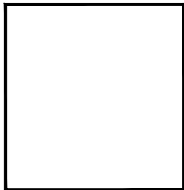
- NOTE:
- PER PUMP MANUFACTURER'S REQUIREMENTS
 - ELEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM
 - TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1' ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.

LIFT STATION #2

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:
- PER PUMP MANUFACTURER'S REQUIREMENTS
 - ELEVATION X - ELEVATION Z ≥ 5 FEET MINIMUM
 - 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

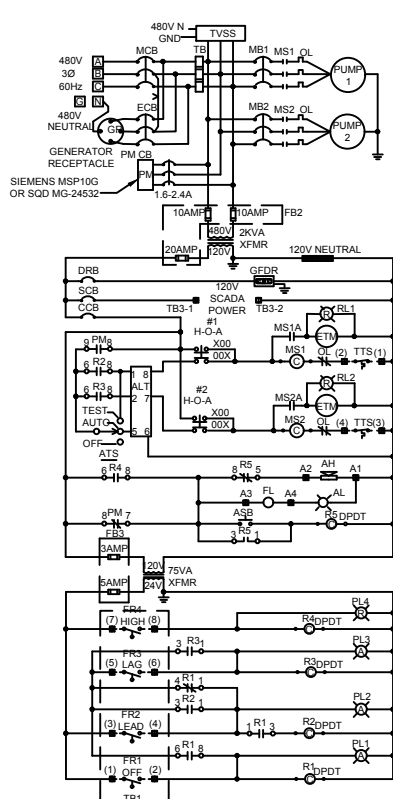
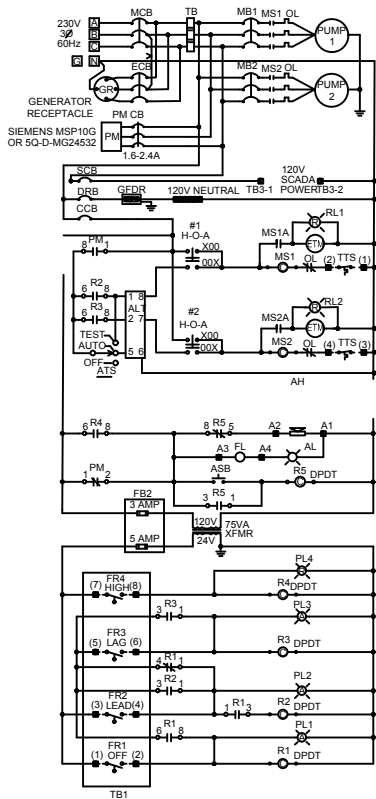


REVISIONS	DATE	DESCRIPTION
1	6-29-07	ADD ALARM HORN
2	7-8-08	CHANGE VOLTAGE FOR 1 AND 3 TO 230
3	4-29-09	A-1111111111111111
4		
5		
6		
7		

BOOTH ERN STRAUGHAN HOTT
ENGINEERS • SURVEYORS • LAND PLANNERS
350 North Sinclair Ave.
Birmingham, AL 35202
Office: 855.343.8881
Fax: 855.343.8885
www.beandh.com
Certificate of Authorization Number: 27029

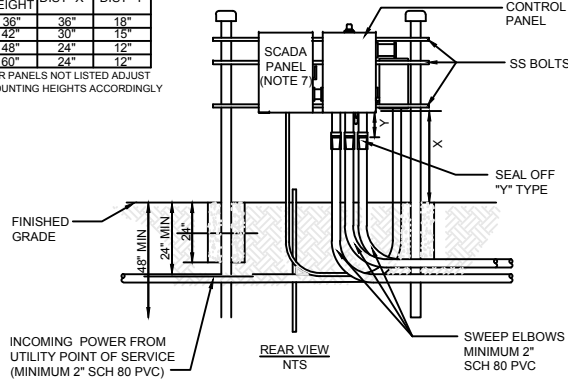
VENEZIA NORTH & SOUTH
RESIDENTIAL SUBDIVISION
LIFT STATION DETAILS

DESIGNED BY: CHN
PROJECT NO.: 0000000000
DATE: MAY 2007
REVISION/REASON BY: CHN
47 of 52

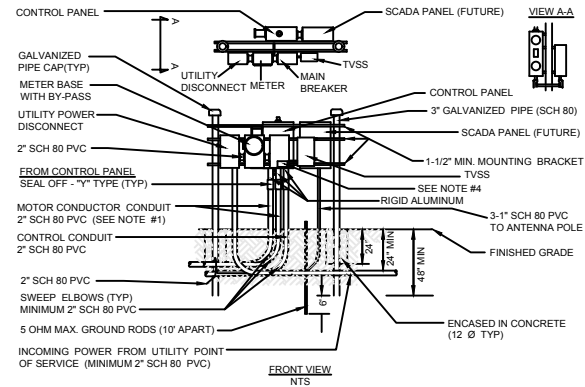


PANEL HEIGHT	DIST "X"	DIST "Y"
36"	36"	18"
42"	30"	15"
48"	24"	12"
60"	24"	12"

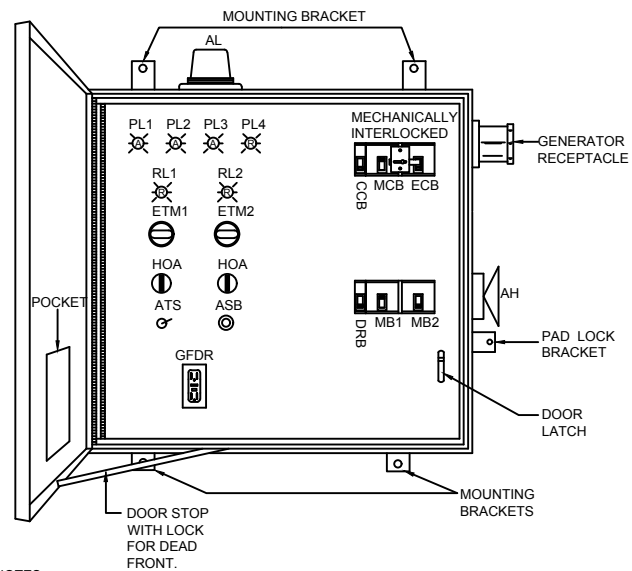
FOR PANELS NOT LISTED ADJUST MOUNTING HEIGHTS ACCORDINGLY



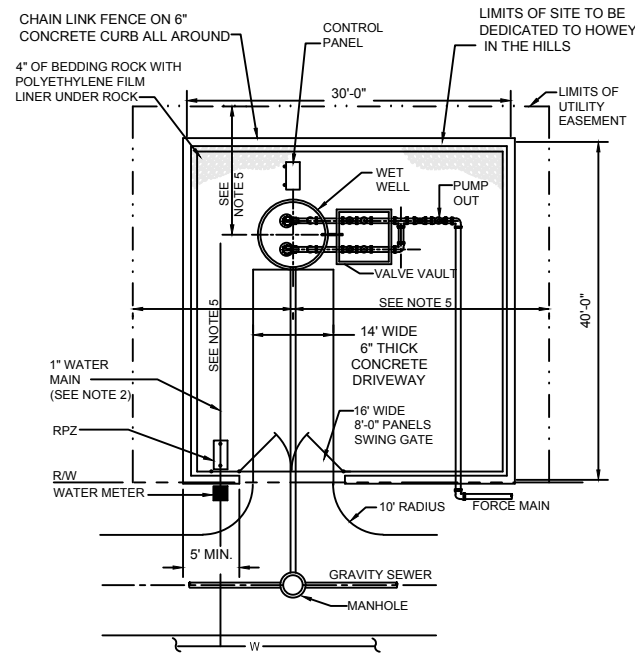
- PANEL INSTALLATION NOTES:**
- PUMP MOTOR CONDUIT SHALL BE SIZE TO ACCOMMODATE 40% CONDUIT FILL. MINIMUM CONDUIT SIZE TO BE 2" SCH 80 PVC.
 - POWER SUPPLY SHALL BE UNDERGROUND ON THE LIFT STATION SITE AND SHALL BE 3-PHASE, FROM A 3-PHASE SOURCE ONLY.
 - AN ELECTRICAL GROUNDING SYSTEM SHALL BE INSTALLED 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.
 - THE STATION NAME, UTILITIES ID NUMBER, AND ADDRESS SHALL BE AFFIXED TO THE FRONT OF THE METER CABINET.
 - ALL MOUNTING HARDWARE AND BRACKETS SHALL BE 316 STAINLESS STEEL.
 - 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.
 - THE SCADA PANEL IS TO SHOWN FOR INFORMATION ONLY AND WILL BE INSTALLED IN THE FUTURE (BY OTHERS).



- PANEL INSTALLATION NOTES:**
- PUMP MOTOR CONDUIT SHALL BE SIZE TO ACCOMMODATE 40% CONDUIT FILL. MINIMUM CONDUIT SIZE TO BE 2" SCH 80 PVC.
 - POWER SUPPLY SHALL BE UNDERGROUND ON THE LIFT STATION SITE AND SHALL BE 3-PHASE, FROM A 3-PHASE SOURCE ONLY.
 - 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. SEE GROUNDING DETAILS.
 - THE STATION NAME, HOWEY IN THE HILLS I.D. NUMBER, AND ADDRESS SHALL BE AFFIXED TO THE FRONT OF THE METER CABINET.
 - ALL MOUNTING HARDWARE & BRACKETS SHALL BE 316 STAINLESS STEEL.
 - 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.
 - THE SCADA PANEL IS SHOWN FOR INFORMATION ONLY AND WILL BE INSTALLED IN THE FUTURE (BY OTHERS).

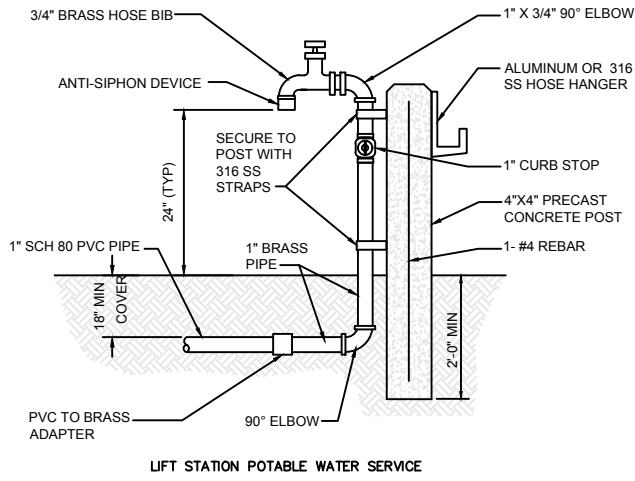


- NOTES:**
- DEADFRONT LAYOUT NEMA TYPE 3R SS ENCLOSURE W/CONTINUOUS HINGE. ALL HARDWARE TYPE 316 SS TYPICAL. ACTUAL LAYOUT MAY VARY WITH HORSEPOWER.
 - THIS CONTROL PANEL, INCLUDING THE GENERATOR RECEPTACLE, COMPLIES WITH THE STANDARD LIST OF COMPONENTS REQUIRED BY UTILITIES.
 - ALL CONTROL WIRE TO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



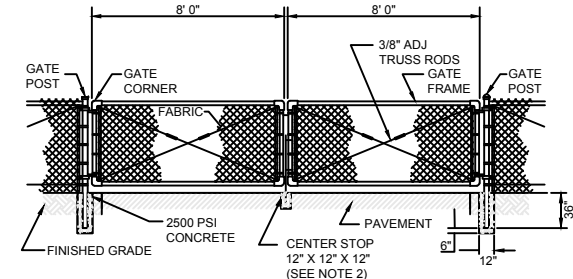
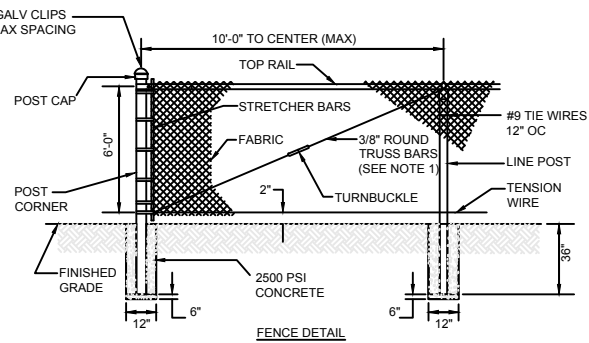
- NOTES:**
- MINIMUM 20' ACCESS DRIVEWAY FROM EDGE OF PAVEMENT TO THE GATE SHALL BE PROVIDED ON NON-RESIDENTIAL ROADS.
 - WASHDOWN WATER SOURCE SHALL BE CONNECTED TO THE POTABLE WATER MAIN.
 - ENGINEER SHALL PROVIDE A SCALED (1" = 20' MIN.) SITE SPECIFIC DETAIL.
 - MINIMUM DISTANCE BETWEEN FENCE AND ALL INSTALLED EQUIPMENT SHALL BE 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



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 SUPPRESSOR
- XFMR - TRANSFORMER



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

DATE	REVISIONS
6-29-07	ADD ALARM HORN



VENEZIA NORTH & SOUTH RESIDENTIAL SUBDIVISION LIFT STATION DETAILS

DESIGNED BY: CCH
PROJECT NO.: 08-000000
DATE: MAY 2007
REVISION/REVISION BY: CCH
48 of 52

CHARLES C. HOTT, 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.

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

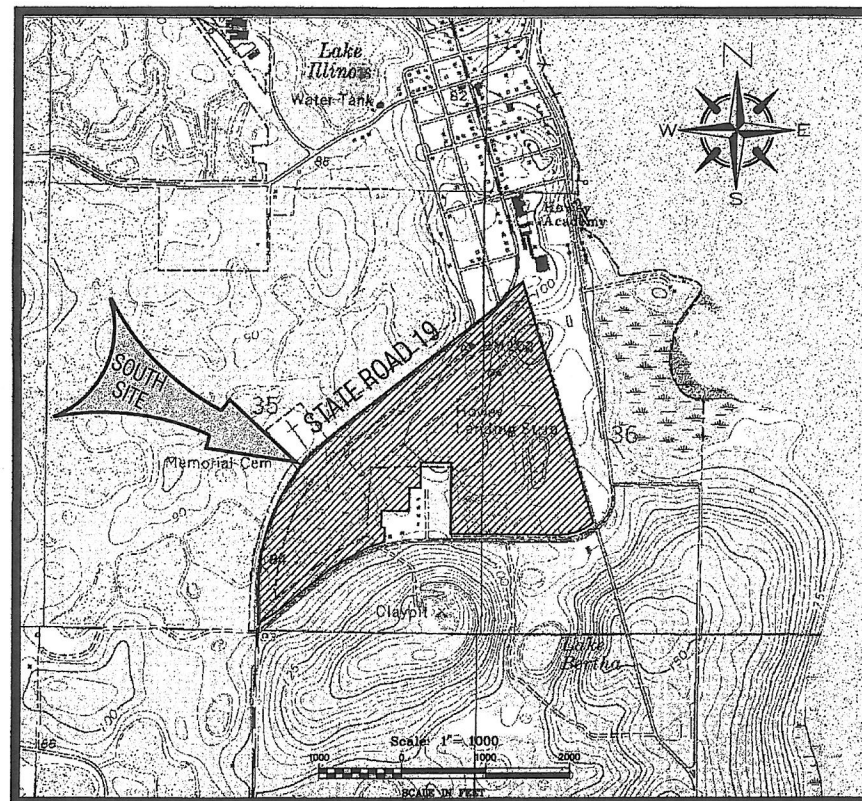
ENGINEER:

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 "HOWEY-IN-THE-HILLS" (AN UNRECORDED PLAT) LYING IN SECTIONS 35 AND 36, TOWNSHIP 22 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 22 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 80°02'16"W, A DISTANCE OF 1208.95 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 LINE 85°12'37"E, A DISTANCE OF 1787.45 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF SAID CURVE 303.86 FEET, CONCAVE NORTHEASTERLY AND HAVING A RADIUS OF 783.56 FEET, A CENTRAL ANGLE OF 22°04'40" AND A CHORD BEARING AND DISTANCE OF N40°08'15"E, 304.84 FEET; THENCE DEPARTING SAID RIGHT OF WAY 153°02'15"E, A DISTANCE OF 248.38 FEET; THENCE N72°56'00"E, A DISTANCE OF 7.90 FEET; THENCE S17°04'35"E, A DISTANCE OF 2208.95 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 440.81 FEET, CONCAVE NORTHERLY, HAVING A RADIUS OF 810.22 FEET, A CENTRAL ANGLE OF 41°40'17" AND A CHORD BEARING AND DISTANCE OF S89°14'53"W, 434.19 FEET TO A POINT OF TANGENCY; THENCE S89°48'55"W, A DISTANCE OF 1287.88 FEET; THENCE DEPART SAID RIGHT OF WAY N03°12'13"W, A DISTANCE OF 849.40 FEET; THENCE S89°48'55"W, A DISTANCE OF 968.14 FEET; THENCE S89°07'50"E, A DISTANCE OF 305.15 FEET; THENCE S89°07'50"E, A DISTANCE OF 135.00 FEET; THENCE S89°07'50"E, A DISTANCE OF 275.35 FEET; THENCE S89°48'55"W, A DISTANCE OF 208.16 FEET; THENCE S89°37'45"W, A DISTANCE OF 200.21 FEET; THENCE N89°47'38"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 3270.02 FEET, A CENTRAL ANGLE OF 9°19'41" AND A CHORD BEARING AND DISTANCE OF S77°29'23"W, 189.81 FEET; THENCE DEPART SAID RIGHT OF WAY LINE S89°21'50"W, A DISTANCE OF 531.85 FEET; THENCE S51°11'58"W, A DISTANCE OF 785.55 FEET; THENCE S52°04'49"W, A DISTANCE OF 308.80 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°05'35"E, A DISTANCE OF 488.11 FEET TO A POINT OF CURVATURE; THENCE ALONG THE ARC OF SAID CURVE 2917.24 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°36'52"E, 1849.96 FEET TO A POINT OF TANGENCY; THENCE N51°23'37"E, A DISTANCE OF 601.65 FEET TO THE POINT OF BEGINNING.

THENCE S89°50'24"W, A DISTANCE OF 232.67 FEET TO THE POINT OF BEGINNING.



VICINITY MAP

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DATE 12-05-07
JUN 29 2007
PDS
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18971-3X
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* See Revised Sheet
Revd 10-31-07
JUN 29 2007

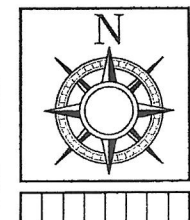
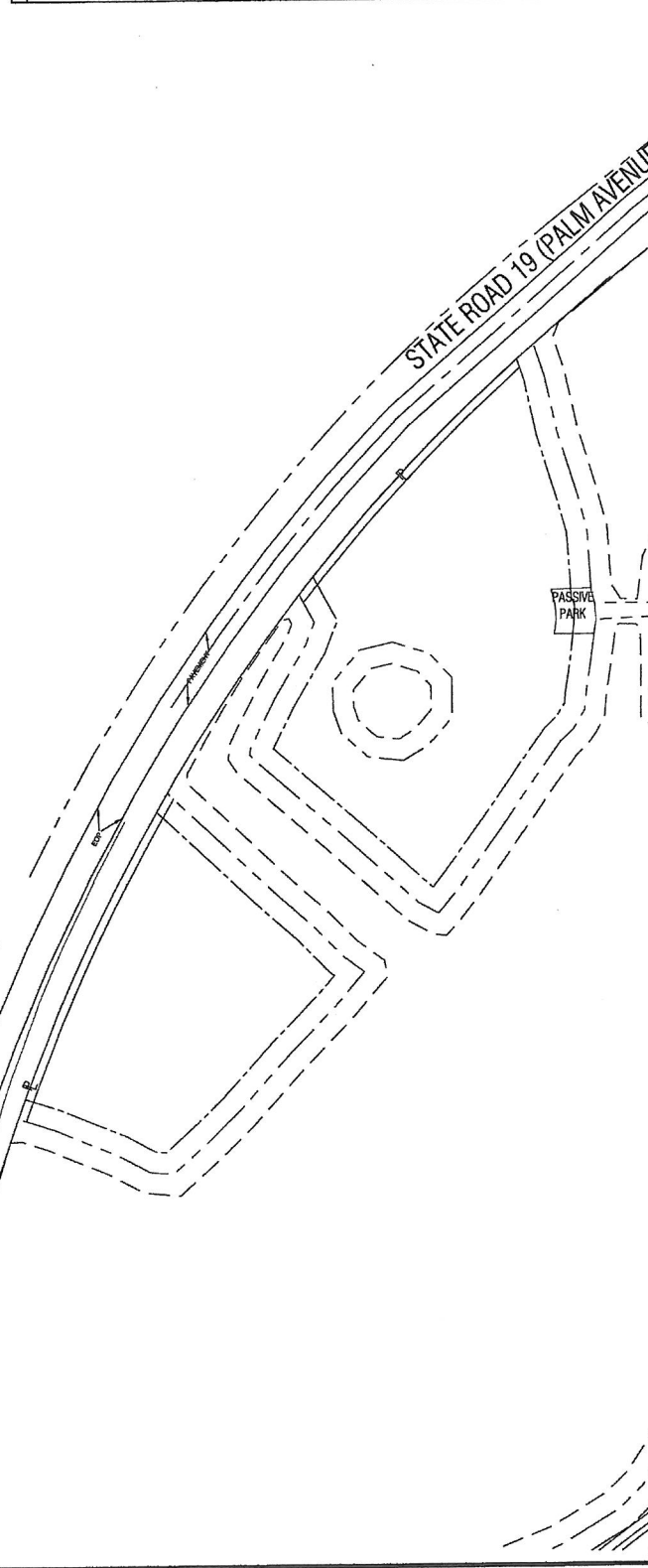
STATE OF FLORIDA CERTIFICATION OF AUTHORIZATION NO. 27029

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MANHOLE ID	STATION	RIM	INV	TO	INV	PIPE	LENGTH	SLOPE
L51 MH #22	218+45.02	101.05	97.05	MH #21	96.57	6" SDR-35	128LF	0.76%
L51 MH #21	214+13.12	100.87	95.87	MH #20	94.54	6" SDR-35	99LF	1.44%
L51 MH #20	215+10.52	98.54	94.44	MH #19	85.35	6" SDR-35	344LF	2.26%
L51 MH #19	209+49.62	96.66	95.44	MH #18	84.64	6" SDR-35	298LF	0.40%
L51 MH #18	302+22.78	87.52	85.32	MH #17	81.84	6" SDR-35	220LF	0.76%
L51 MH #17	281+11.90 300+26.00	85.64	81.84	MH #16	79.94	6" SDR-35	400LF	0.40%
L51 MH #16	306+1.451	92.84	79.84	MH #15	78.27	6" SDR-35	143LF	0.40%
L51 MH #15	288+44.40 490+09.00	93.88	79.17	MH #9	77.88	6" SDR-35	288LF	0.40%
L51 MH #14	512+22.76	100.63	96.73	MH #13	92.42	6" SDR-35	212LF	0.62%
L51 MH #13	510+08.06	99.42	95.32	MH #12	93.88	6" SDR-35	168LF	0.90%
L51 MH #12	008+35.82	97.68	93.58	MH #11	92.30	6" SDR-35	132LF	0.97%
L51 MH #11	507+04.67	96.30	92.06	MH #10	88.49	6" SDR-35	368LF	1.01%
L51 MH #10	503+34.17	92.49	88.39	MH #8	78.98	6" SDR-35	331LF	2.84%
L51 MH #9	405+01.75	88.07	77.88	MH #8	78.89	6" SDR-35	247LF	0.40%
L51 MH #8	405+59.78	90.69	76.79	MH #7	76.30	6" SDR-35	123LF	0.40%
L51 MH #7	406+48.29	91.02	76.20	MH #6	75.59	6" SDR-35	153LF	0.40%
L51 MH #6	408+37.89	89.88	75.48	MH #5	73.93	6" SDR-35	390LF	0.40%
L51 MH #5	412+30.40	90.18	73.83	MH #4	73.23	6" SDR-35	140LF	0.40%
L51 MH #4	413+74.13	88.35	75.17	MH #3	72.87	6" SDR-35	86LF	0.40%
L51 MH #3	---	xx	72.73	MH #2	71.92	6" SDR-35	202LF	0.40%
L51 MH #2	---	xx	71.82	MH #1	71.68	6" SDR-35	54LF	0.40%
L51 MH #1	---	xx	71.58	L5	71.54	8" SDR-35	11LF	0.40%

MANHOLE ID	STATION	RIM	INV	TO	INV	PIPE	LENGTH	SLOPE
LS2 MH #28	234+35.59	83.39	78.39	MH #28	77.51	8" SDR-35	221'1F	0.40%
LS2 MH #25	232+17.85	87.42	78.57	MH #24	74.48	8" SDR-35	278'1F	0.40%
LS2 MH #24	229+35.28	83.47	74.36	MH #19	73.34	8" SDR-35	225'5F	0.40%
LS2 MH #23	610+72.23	85.89	81.89	MH #22	81.23	8" SDR-35	181'1F	0.40%
LS2 MH #22	608+07.66	87.77	81.13	MH #21	79.88	8" SDR-35	313'2F	0.40%
LS2 MH #21	805+50.45	89.31	79.78	MH #20	78.59	8" SDR-35	298'1F	0.40%
LS2 MH #20	802+88.50	86.92	78.49	MH #19	77.35	8" SDR-35	285'1F	0.40%
LS2 MH #19	228+74.87 600+50.00	83.80	73.24	MH #13	72.57	8" SDR-35	168'1F	0.40%
LS2 MH #18	217+40.71	100.61	96.51	MH #17	95.20	8" SDR-35	144'1F	1.26%
LS2 MH #17	214+04.58	99.30	95.10	MH #16	93.59	8" SDR-35	85'1F	1.78%
LS2 MH #16	219+36.42	97.59	93.49	MH #15	87.55	8" SDR-35	321'1F	1.85%
LS2 MH #15	222+59.89	91.55	87.45	MH #14	86.08	8" SDR-35	79'1F	1.80%
LS2 MH #14	223+36.77	90.08	85.88	MH #13	79.50	8" SDR-35	162'1F	0.40%
LS2 MH #13	218+33.30 118+35.07	87.00	72.47	MH #12	70.80	8" SDR-35	388'1F	0.40%
LS2 MH #12	115+40.57	94.00	79.60	MH #11	69.81	8" SDR-35	248'1F	0.40%
LS2 MH #11	112+50.37	90.28	69.71	MH #8	66.69	8" SDR-35	240'1F	0.40%
LS2 MH #10	513+75.47	100.18	96.18	MH #9	94.88	8" SDR-35	103'1F	1.26%
LS2 MH #9	514+80.85	88.86	84.78	MH #8	80.00	8" SDR-35	330'1F	0.40%
LS2 MH #8	518+30.30 110+40.68	91.39	85.59	MH #7	67.30	8" SDR-35	323'1F	0.40%
LS2 MH #7	107+17.77	88.38	69.20	MH #6	66.28	8" SDR-35	231'1F	0.40%
LS2 MH #6	104+86.40	100.38	85.18	MH #5	85.44	8" SDR-35	186'1F	0.40%
LS2 MH #5	---	xx	65.34	MH #4	64.25	8" SDR-35	272'1F	0.40%
LS2 MH #4	---	xx	64.15	MH #3	63.34	8" SDR-35	203'1F	0.40%
LS2 MH #3	---	xx	63.24	MH #2	62.49	8" SDR-35	187'1F	0.40%
LS2 MH #2	---	xx	62.39	L5	61.72	8" SDP-35	154'1F	0.60%

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



MATCH LINE

	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 Well
	Drainage Easement
	Utility Easement

UTILITY PLAN
Sheet A

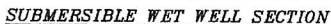
CHECKED BY: CCH
PROJECT NO.: 051373.0000
DATE: JUNE 2006
DESIGNED/DRAWN BY: LCS
SHT. 10 OF 37

JUN 29 2007
CCY
CHARLES C. HOTT, P.E.
PROFESSIONAL ENGINEER 5481



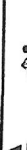
1. SUPPORT FRAME TO BE FABRICATED FROM 316 STAINLESS STEEL.
ALL SCREWS, NUTS, BOLTS, STRAPS, AND SIMILAR CONNECTORS SHALL BE 316 STAINLESS STEEL.
PROVIDE NEOPRENE PAD AND/OR FIBER WASHERS BETWEEN DISSIMILAR METALS.
2. ALL CONDUIT AND FITTINGS WITHIN 12" OF EQUIPMENT
PAD AND GRADE TO BE ROS.
3. ALL BOXES, FITTINGS AND PIPES TO BE NDM
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.

PACKAGED LIFT STATION
ELECTRICAL EQUIPMENT RACK



1. ALL BOXES, INCLUDING SWITCH GEAR, ELECTRIC METER CANS, DISCONNECT, AND ALL MISCELLANEOUS 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
4. ROAD TO SLAB REBAR, USE #4 BARE COPPER MIN.
5. 100 AMP 3-PHASE, CIRCUIT BREAKER MAINLINE TRANSFER SWITCH IN WEATHERPROOF ENCLOSURE.
6. 100 AMP 3 PHASE S-N FUSED 240 VOLT WEATHERPROOF DISCONNECT.
7. GENERATOR RECEPTACLE, RUSSELL & STOLL.
8. PACKAGE PUMP STATION CONTROL PANEL.
9. LIGHTNING ARRESTOR - SQUARE D No. SDSA 3650.

PACKAGED LIFT STATION ELECTRICAL SERVICE SCHEMATIC



SOUTH COAST PROFESSIONAL ENGINEERS, INC.
ENGINEERS • SURVYORS • LAND PLANNERS

350 North Sinderel Ave.
Taverns, Florida 32776
www.beandh.com

Office: 352.243.2661
Fax: 352.243.5498
Certificate of Authorization Number: 27059

VENEZIA SOUTH
PRESIDENTIAL SUBDIVISION
LIFT STATION DETAILS

CHECKED BY:	CCH
PROJECT NO.:	051373.000
DATE:	JUNE 2006
DRAWN BY:	LCS
DESIGNED BY:	LCS
SHT. 33 37	

JUN 12-9 2007
 CHARLES C. HIOTT, P.E.
 PROFESSIONAL ENGINEER 5491

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:

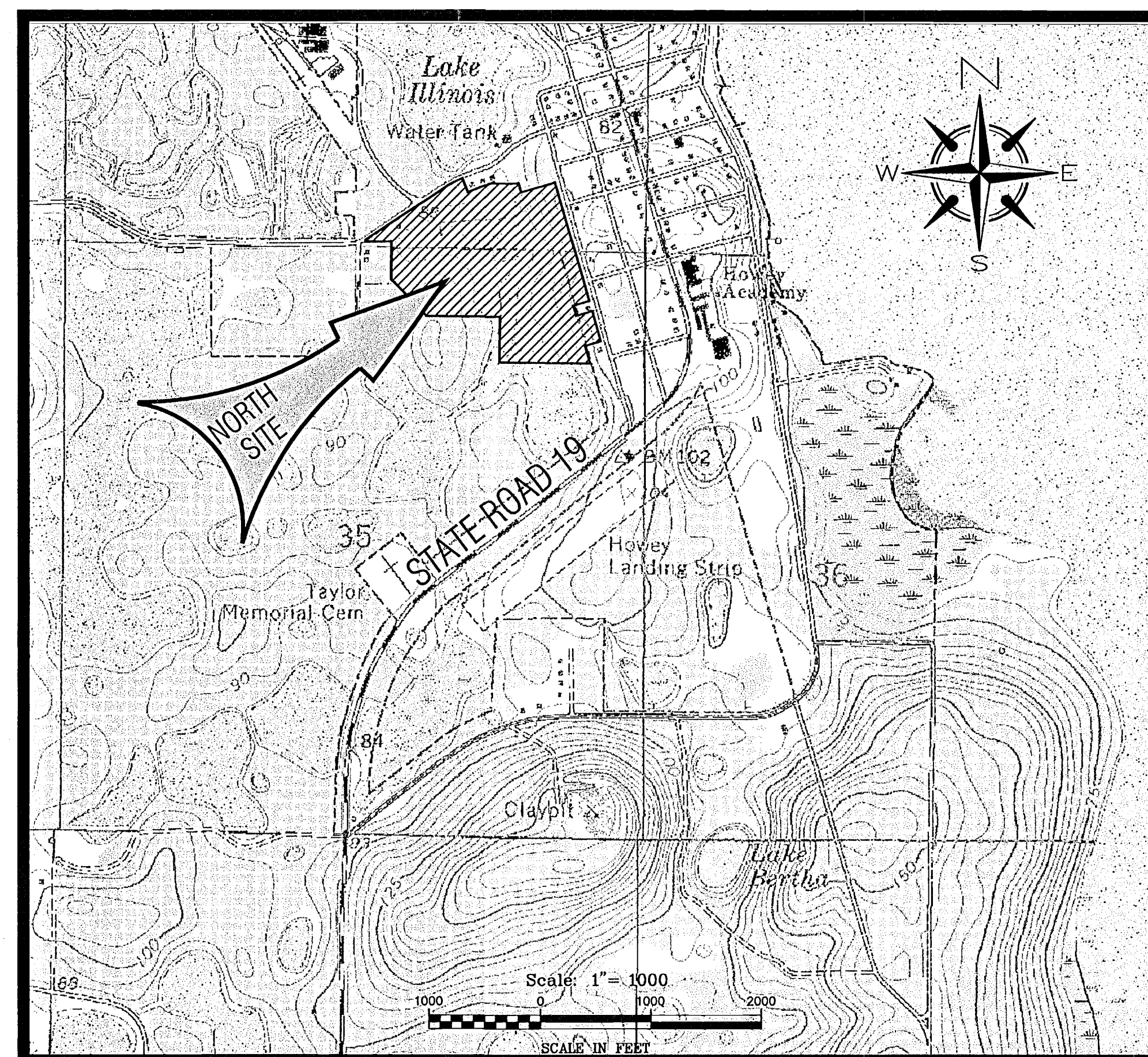
FLAGSHIP HARB, LLC
916 HIGHLAND AVENUE
ORLANDO, FLORIDA 32803
(407) 246-1144
(407) 246-1155 FAX
CONTACT: TED BOLIN

ENGINEER:

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

LEGAL DESCRIPTION:

NORTH PARCEL
A PARCEL OF LAND BEING A PORTION OF "GROVE GARDENS" (PLAT BOOK 17, PAGE 2) AND "HOWE-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°00'00"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 N66°00'00"E, A DISTANCE OF 821.20 FEET; THENCE N64°54'03"E, A DISTANCE OF 134.15 FEET; THENCE DEPART SAID RIGHT OF WAY LINE S22°46'58"E, A DISTANCE OF 134.90 FEET; THENCE N67°23'46"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°57'30"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 149.30 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°58'07"W, A DISTANCE OF 149.83 FEET; THENCE S17°02'42"E, A DISTANCE OF 164.96 FEET; THENCE N00°00'00"W, A DISTANCE OF 835.94 FEET TO A POINT ON THE WEST BOUNDARY 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 659.75 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.

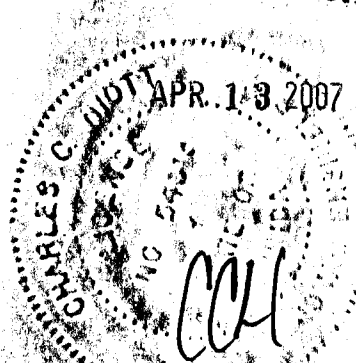


VICINITY MAP

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ALTAMONTE SVC. CTR.



STATE OF FLORIDA CERTIFICATION OF AUTHORIZATION NO. 27029

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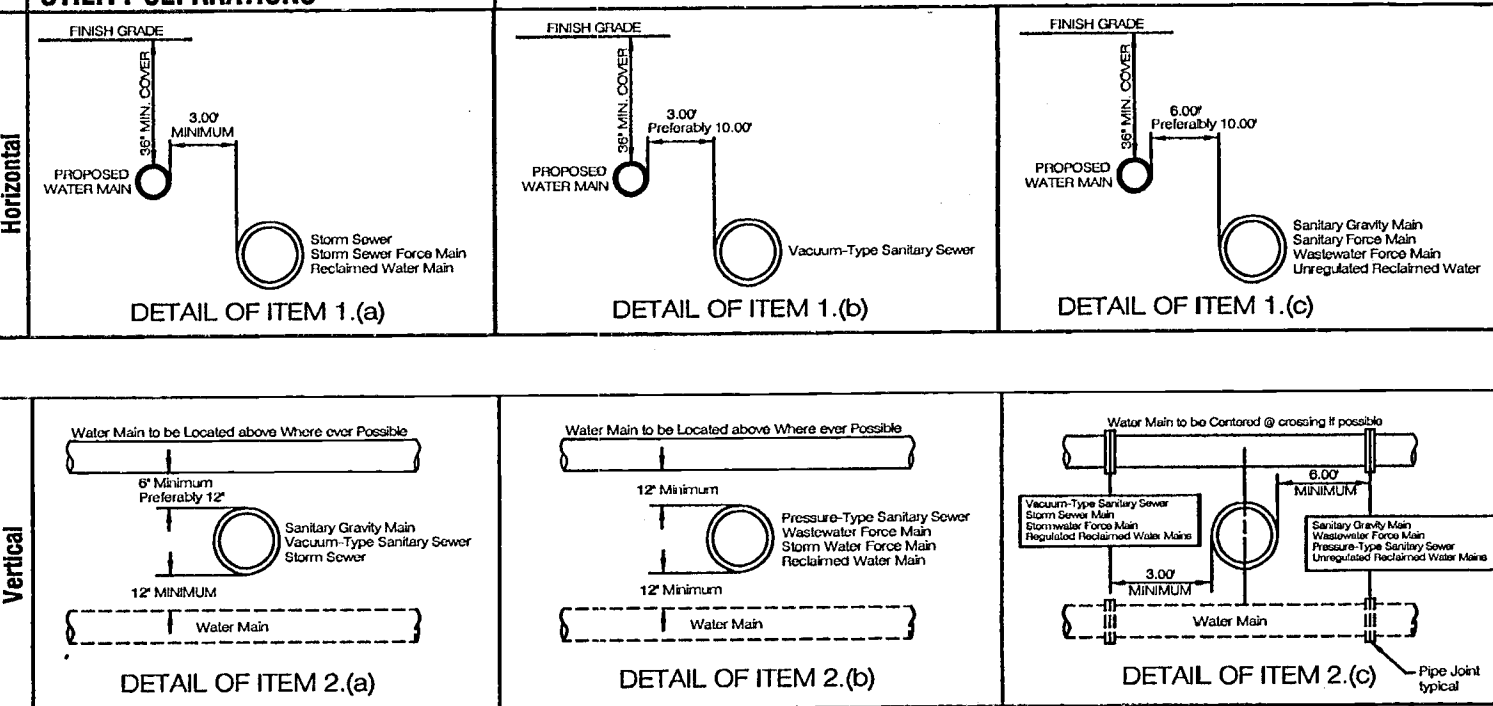
SANITARY PIPE CHART

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	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 #11	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	95.00	80.23	MH #7	77.10	8" SDR-35	240LF	0.40%
MH #7	32+40.66	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	86.87	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	88.24	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.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL MATERIALS PRIOR TO FINAL BIDDING.
3. ALL STRUCTURE INVERTS SHALL BE POURED AND SHAPED TO PROMOTE FLOW AND TO PREVENT STANDING WATER.
4. ALL CONSTRUCTION MATERIALS SHALL CONFORM TO THE LATEST TOWN OF HOWEY-IN-THE-HILLS STANDARDS AND SPECIFICATIONS.
5. ALL CONSTRUCTION SHALL BE SUBJECT TO INSPECTIONS AND APPROVALS BY THE PROJECT ENGINEER AND THE TOWN OF HOWEY-IN-THE-HILLS.

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 Hydrantless; 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 Water Mains and Sanitary or Storm Sewers, Wastewater or Stormwater 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 vacuum-type Sanitary Sewer.
 - (b) 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.
 - (c) 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 "on-site Sewage Treatment and Disposal System" as defined in Section 381.006(2), F.S. and Rule 64E-6.002, F.A.C.
 - (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 381.006(2), F.S. and Rule 64E-6.002, F.A.C.
 - (2) Vertical Separation Between Water Mains and Sanitary or Storm Sewers, Wastewater or Stormwater Force Mains, Reclaimed Water Pipelines, and On-site Sewage Treatment and Disposal Systems:
 - (a) New or relocated, underground water mains crossing any existing or proposed gravity- or vacuum-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) Twelve 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) 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. 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 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.
 - (c) Separation Between Water Mains and Sanitary or Storm Sewer Manholes:
 - (i) No water main shall pass thru, or come into contact with any part of a Sanitary Manhole or a Storm Sewer Manhole.
 - (ii) 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 that are 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 381.006(2), F.S. and Rule 64E-6.002, F.A.C.
 - (d) Exceptions/Relief: Adherence to the above constraints and separations in Items 1 through 4 shall be permitted, "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 or record for the appropriate solution, which will be submitted to "The Department of Environmental Protection" for APPROVAL, prior to work commencement.

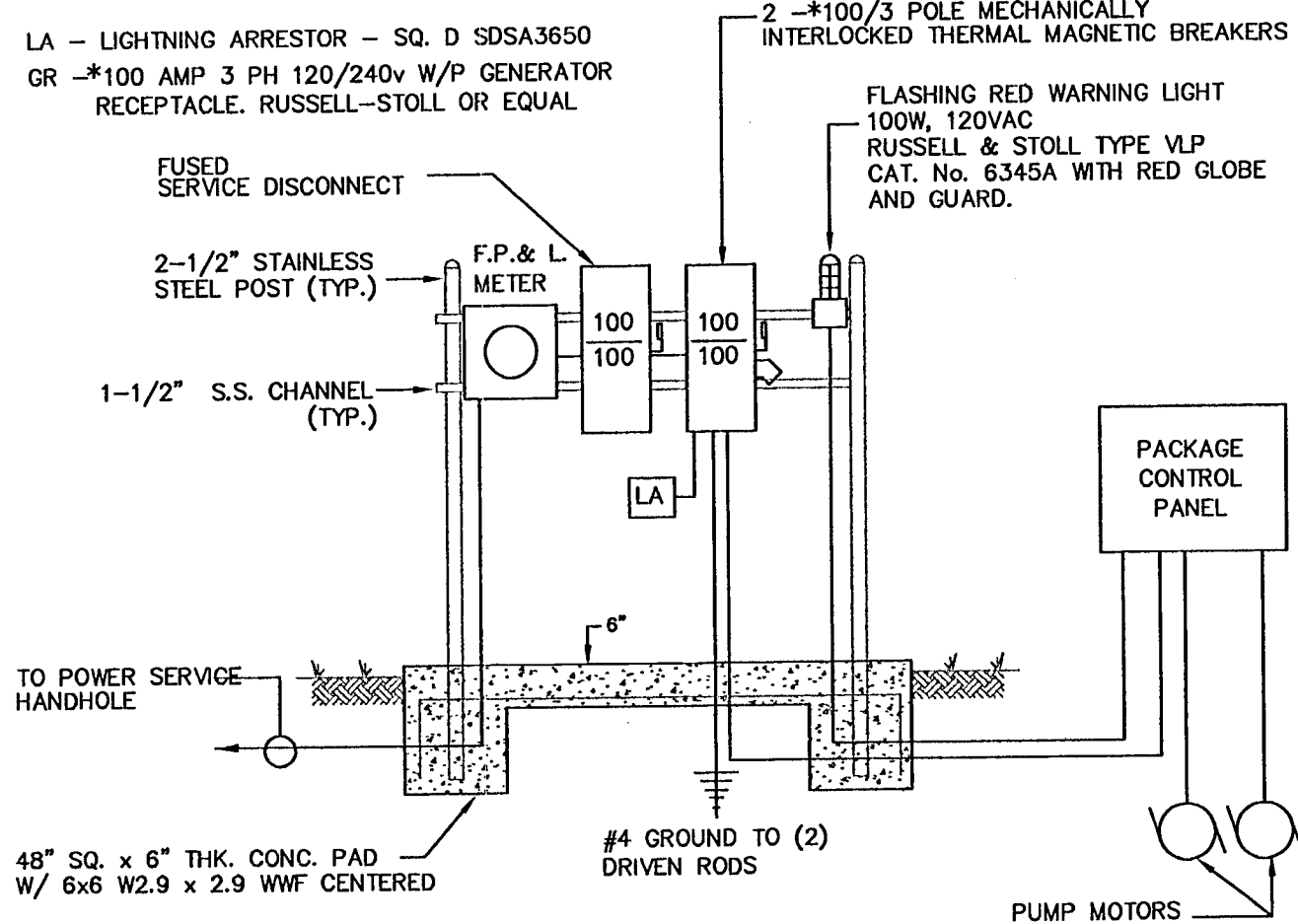
COLOR CODING

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 ring, or shall be white or black pipe with blue stripes incorporated into, or applied to, the pipe wall. Pipe stripes 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. Above-ground 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 above-ground pipe 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 ANMA 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 ANMA C-900, DR 18 for all pipe sizes 4" - 12". Pipes 14" or larger shall be ANMA C-905, DR 18. All couplings, clearing 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 30" minimum cover from finish grade.
5. Water mains to be located 6.00' from 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 ANMA Standard C651 "Disinfecting Water Mains", and all appropriate agency approval.
8. All hydrostatic tests shall be in accordance with ANMA C600 for Ductile Iron Pipe and C608/623 for PVC pipe.
9. All water mains shall be installed, pressure and leak tested in accordance with ANMA C600, (62-555.320(1)) and (62-555.320(2)) and (62-555.320(3)) and (62-555.320(4)) and (62-555.320(5)) and (62-555.320(6)) and (62-555.320(7)) and (62-555.320(8)) and (62-555.320(9)) and (62-555.320(10)) and (62-555.320(11)) and (62-555.320(12)) and (62-555.320(13)) and (62-555.320(14)) and (62-555.320(15)) and (62-555.320(16)) and (62-555.320(17)) and (62-555.320(18)) and (62-555.320(19)) and (62-555.320(20)) and (62-555.320(21)) and (62-555.320(22)) and (62-555.320(23)) and (62-555.320(24)) and (62-555.320(25)) and (62-555.320(26)) and (62-555.320(27)) and (62-555.320(28)) and (62-555.320(29)) and (62-555.320(30)) and (62-555.320(31)) and (62-555.320(32)) and (62-555.320(33)) and (62-555.320(34)) and (62-555.320(35)) and (62-555.320(36)) and (62-555.320(37)) and (62-555.320(38)) and (62-555.320(39)) and (62-555.320(40)) and (62-555.320(41)) and (62-555.320(42)) and (62-555.320(43)) and 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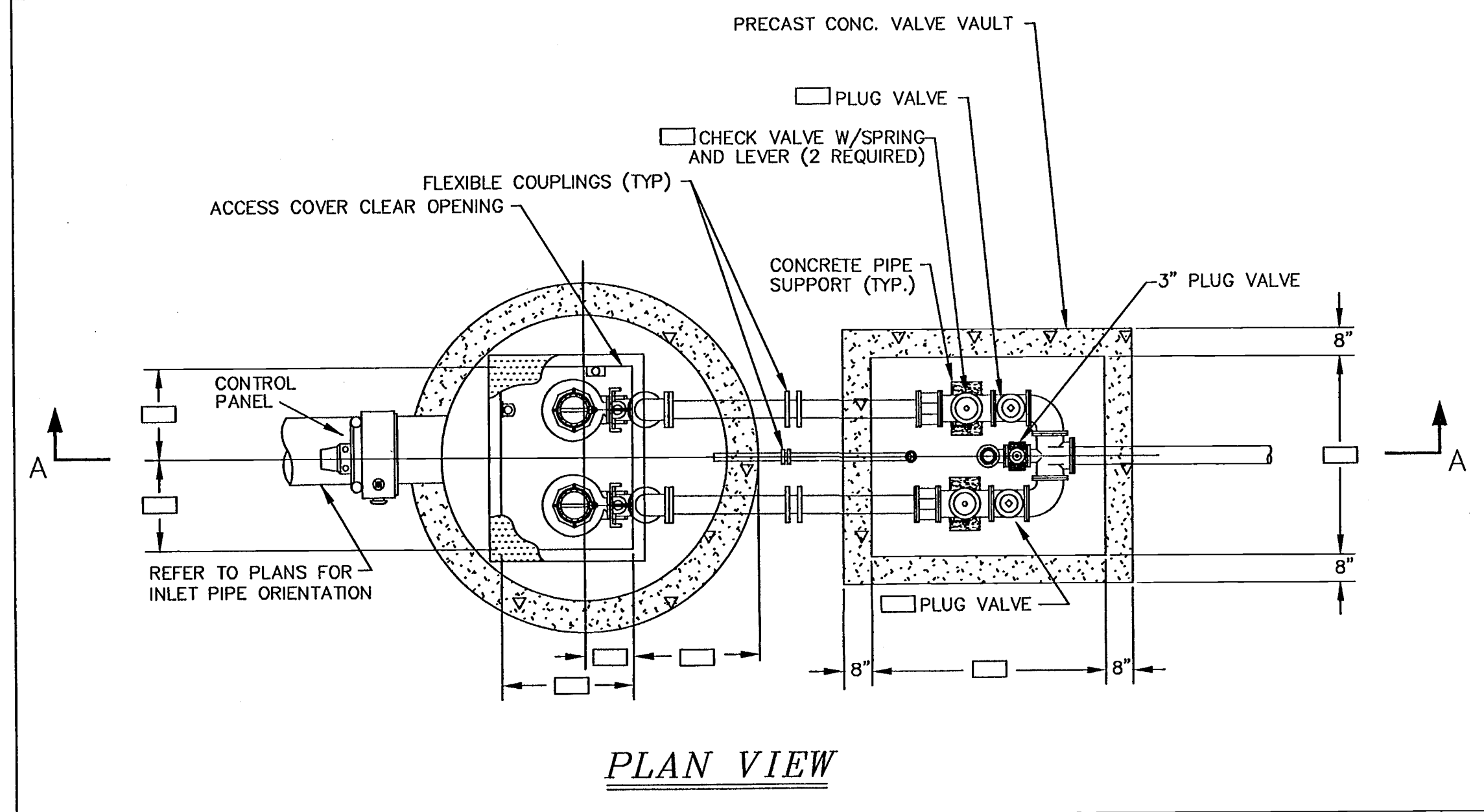


- NOTES:
1. SUPPORT FRAME TO BE FABRICATED FROM 316 STAINLESS STEEL. ALL SCREWS, NUTS, BOLTS, STRAPS, AND SIMILAR CONNECTORS SHALL BE 316 STAINLESS STEEL. PROVIDE NEOPRENE PAD AND/OR FIBER WASHERS BETWEEN DISSIMILAR METALS.
 2. ALL CONDUIT AND FITTINGS WITHIN 12" OF EQUIPMENT PAD AND GRADE TO BE RGS.
 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.

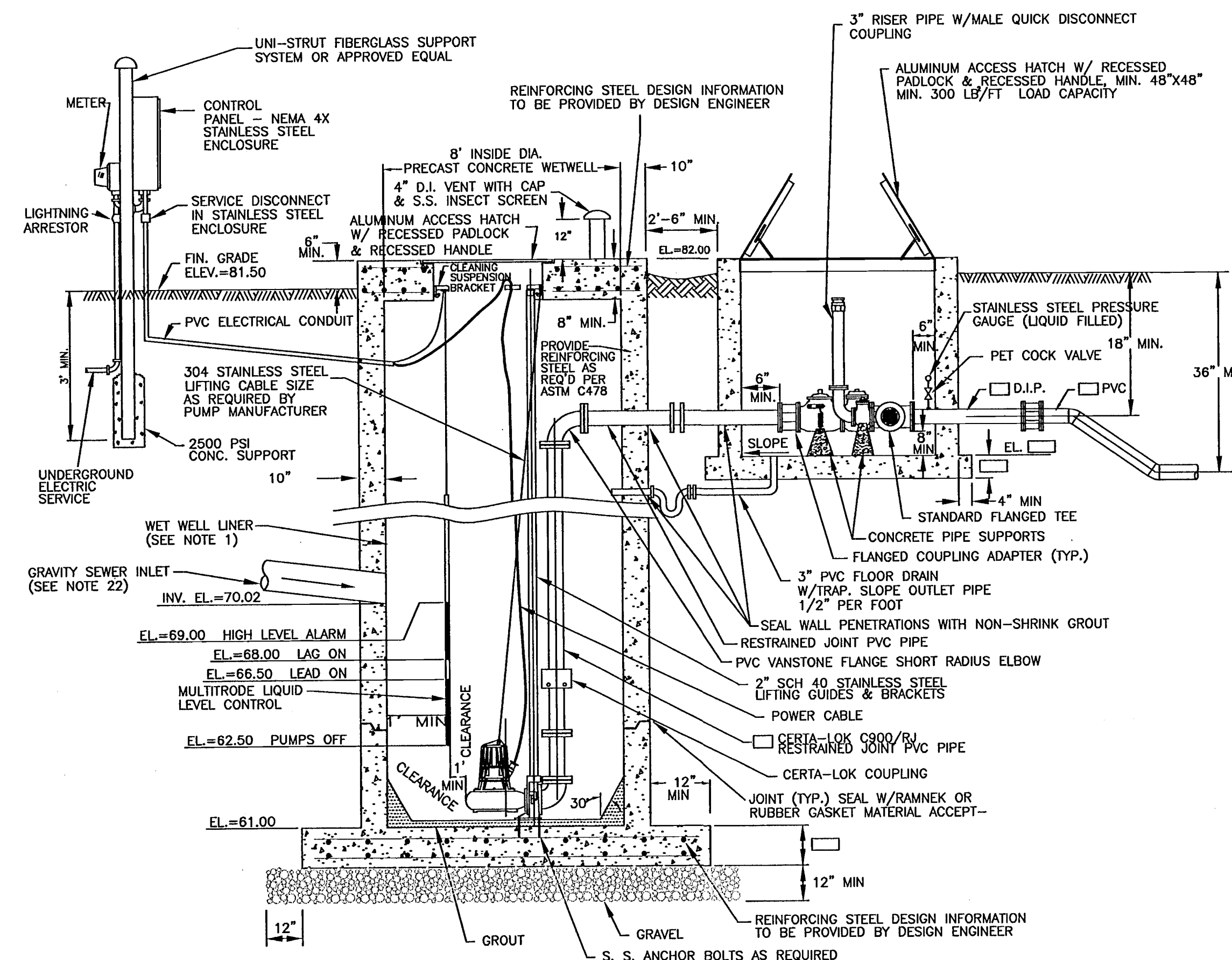
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GENERAL NOTES SUBMERSIBLE PUMP STATION:

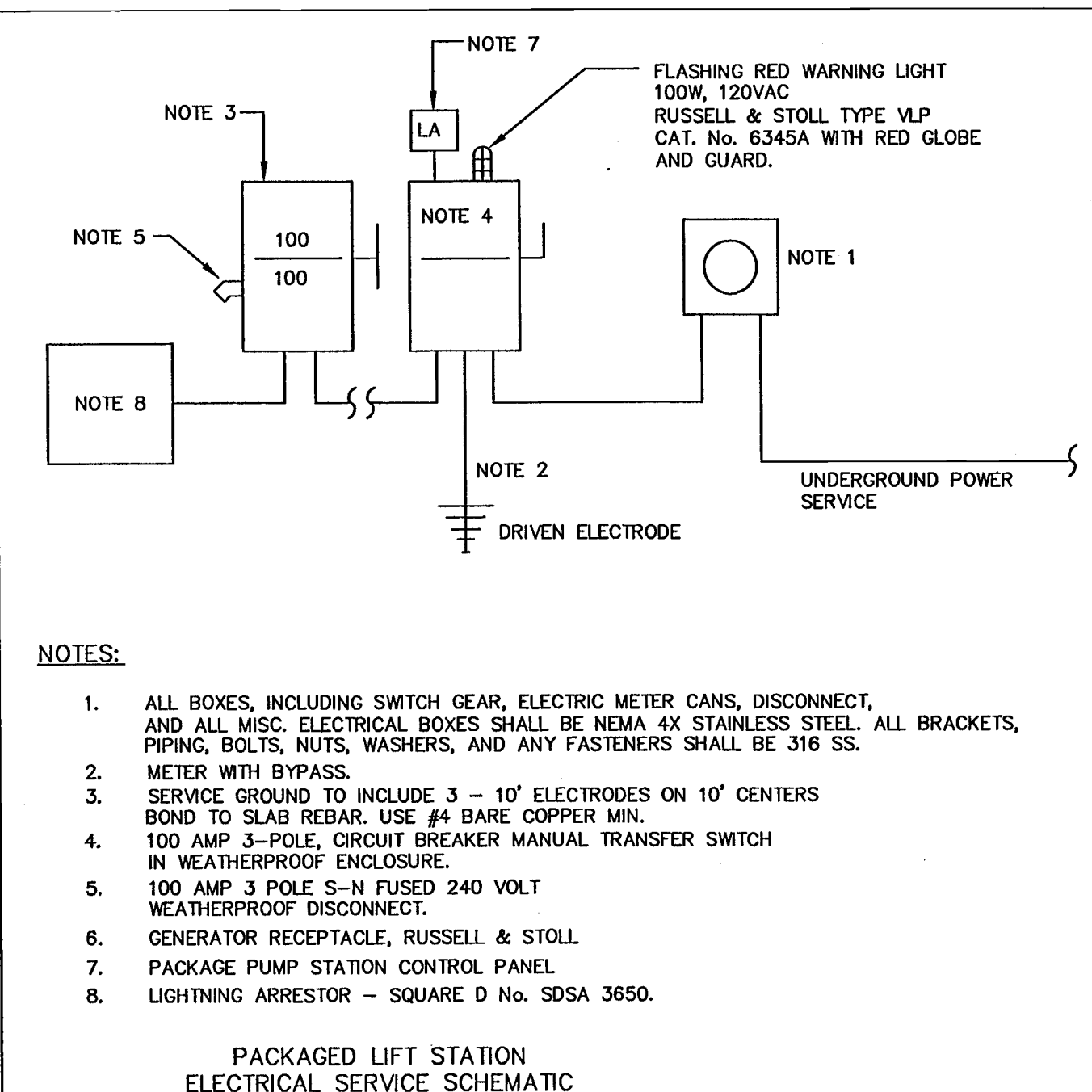
1. WET WELL SHALL BE LINED WITH "AGRU SURE GRIP" CONCRETE PROTECTIVE LINER OR APPROVED EQUAL. WET WELL EXTERIOR SHALL BE COATED WITH COAL TAR EPOXY.
2. BASE AND FIRST RISER UNIT TO BE CAST MONOLITHIC.
3. VALVE VAULT AND ACCESS COVERS SHALL BE SIZED TO PERMIT EASY REMOVAL OF CHECK VALVE.
4. VALVE VAULT 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 304SS 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 #S3425-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 MTIS-5 SUPPRESSOR.



PLAN VIEW

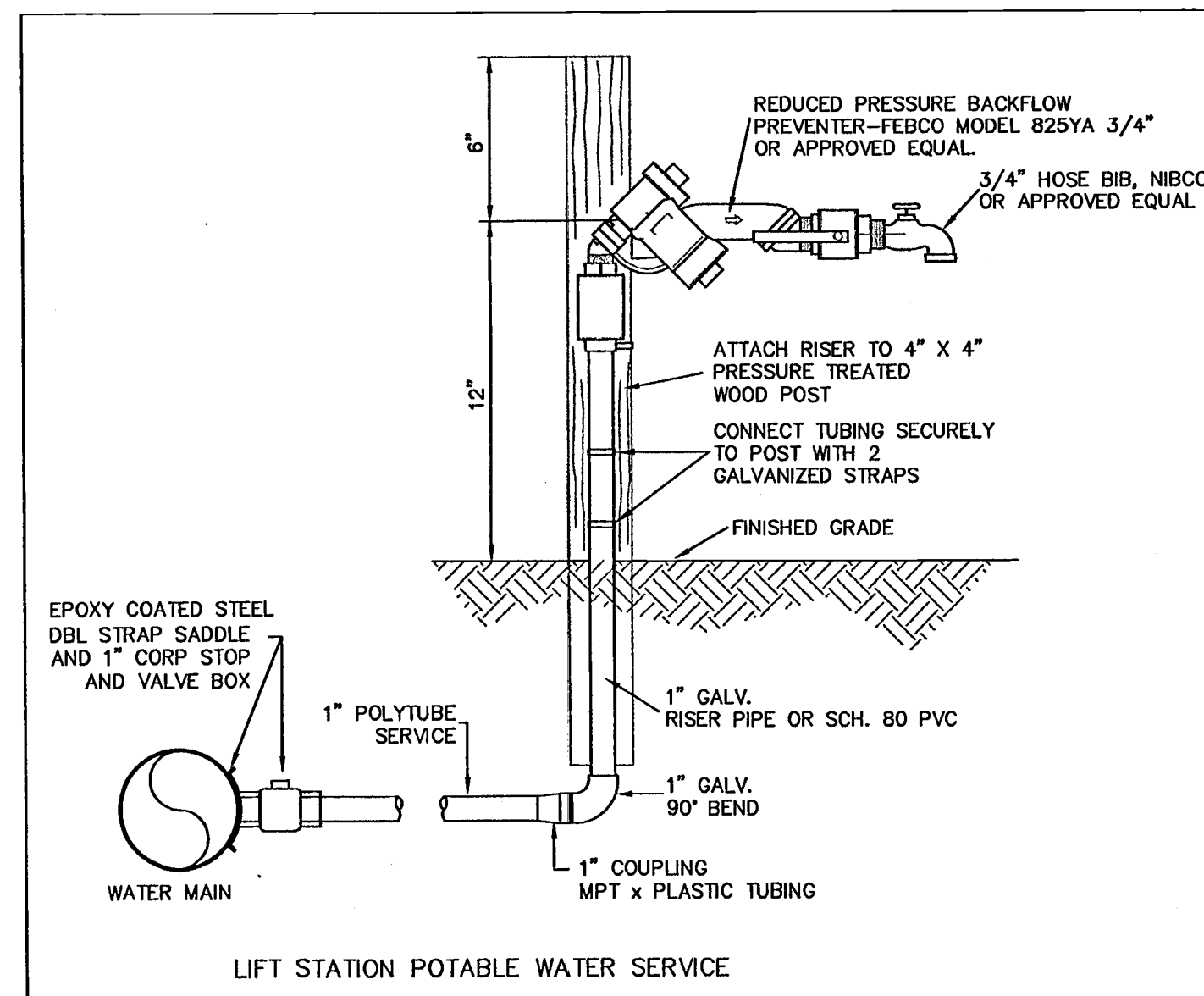


SUBMERSIBLE WET WELL SECTION

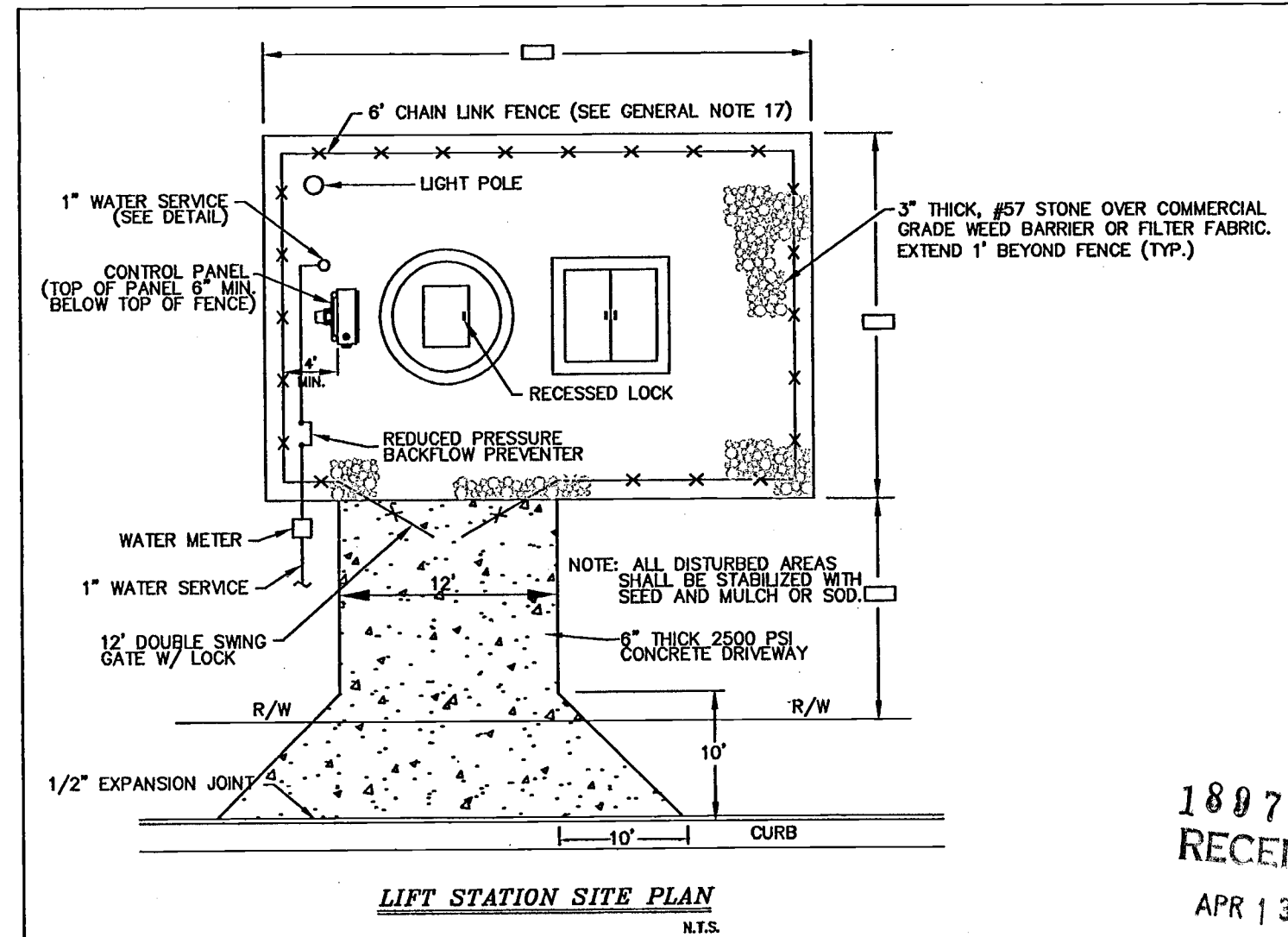


- NOTES:
1. ALL BOXES, INCLUDING SWITCH GEAR, ELECTRIC METER CANS, DISCONNECT, AND ALL MISC. ELECTRICAL BOXES SHALL BE NEMA 4X STAINLESS STEEL. ALL BRACKETS, PIPING, BOLTS, NUTS, WASHERS, AND ANY FASTENERS SHALL BE 316 SS.
 2. METER WITH BYPASS.
 3. SERVICE GROUND TO INCLUDE 3 - 10' ELECTRODES ON 10' 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

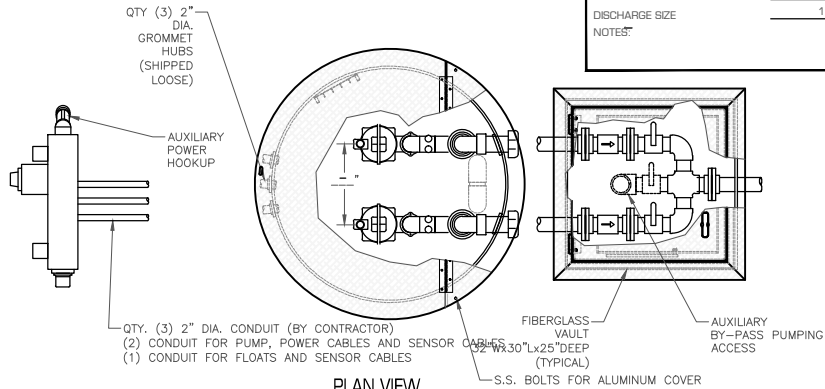


VENEZIA NORTH
RESIDENTIAL SUBDIVISION
LIFT STATION DETAILS

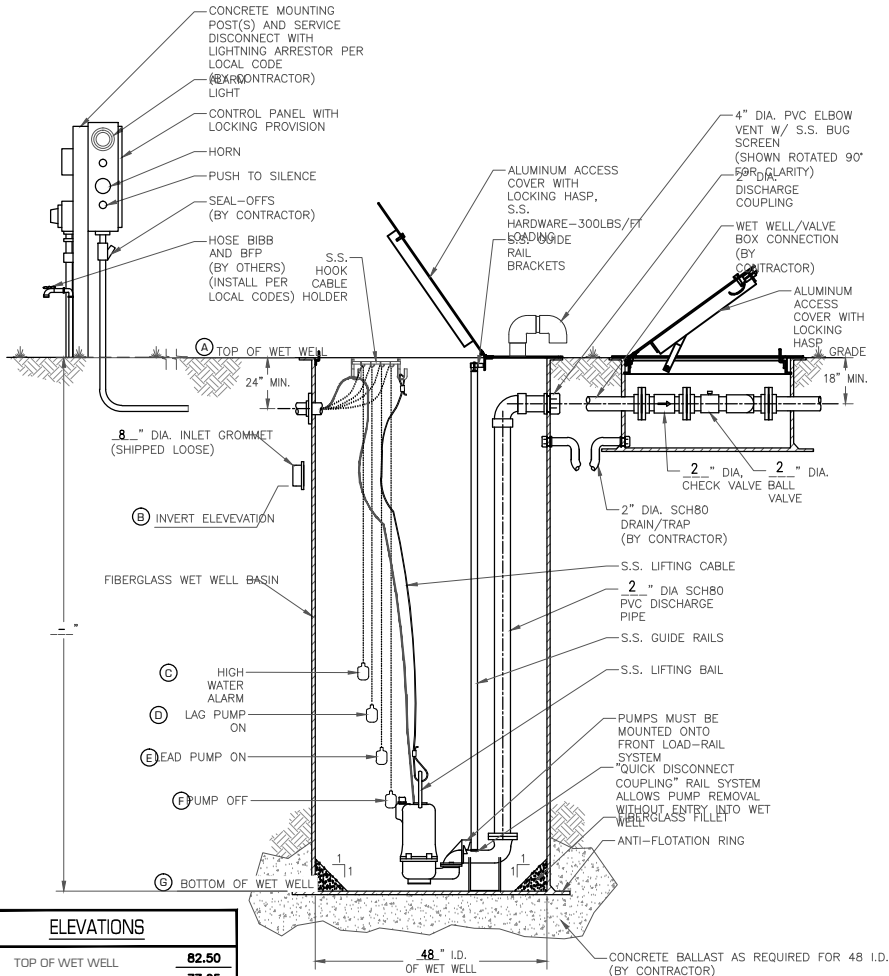
CHECKED BY: OCH
PROJECT NO.: 051373.0000
DATE: JUNE 2006
DRAWN BY: LCS
DESIGNED BY: LCS
SH: 18 OF 22
APR 13 2007
1807-2
RECEIVED
APR 13 2007
PDS
ALTA MONTAGNA, INC. CTR.
CHARLES C. HOIT, P.E.
PROFESSIONAL ENGINEER 54813

LIFT STATION #1

WET WELL/VALVE BOX LAYOUT



PLAN 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

SECTION VIEW

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:	

GENERAL NOTES

PUMPS SHALL BE OF THE SUBMERSIBLE TYPE (MANUFACTURED BY HYDRAMOTIC OR HOMA). EACH PUMP SHALL BE MOUNTED ON A 62" 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

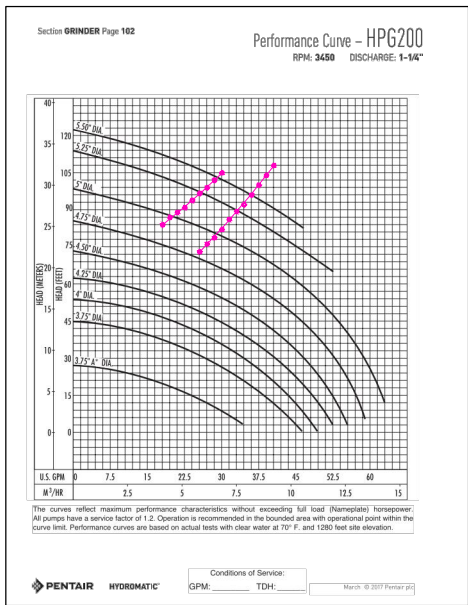
ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES.

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 BASINS, 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.

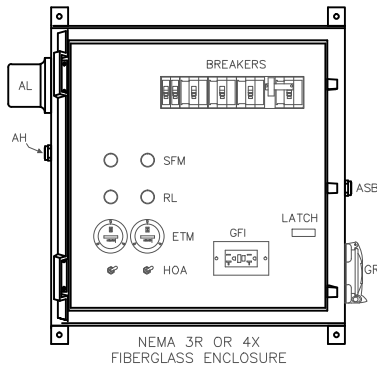
PUMP PERFORMANCE CURVE



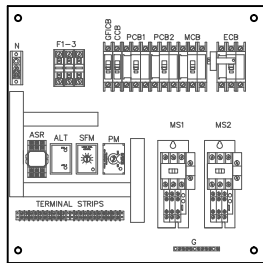
ELECTRICAL

INCOMING POWER: _____ V _____ Ø
(CONTRACTOR TO VERIFY)

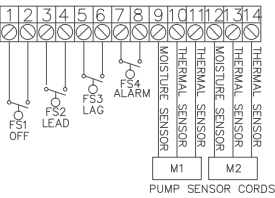
ENCLOSURE AND DEADFRONT LAYOUT (TYPICAL)
(OUTER DOOR REMOVED)



BASE PLATE LAYOUT (TYPICAL)



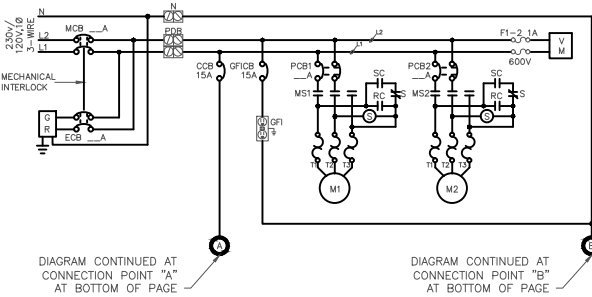
FIELD TERMINALS



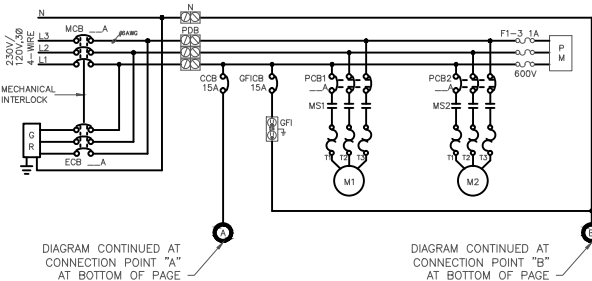
LEGEND

ABBR.	DESCRIPTION
ENC	ENCLOSURE, 4X, 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
TR	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

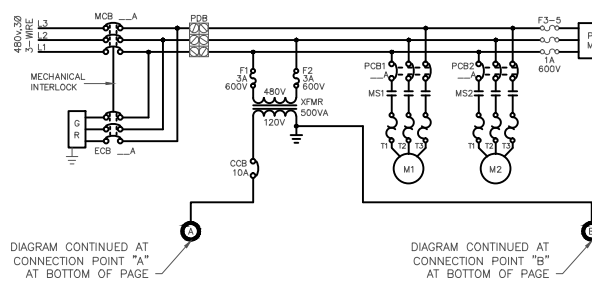
230V SINGLE PHASE WIRING DIAGRAM



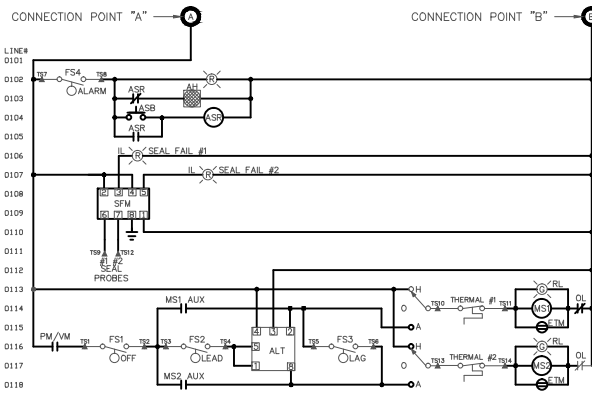
230V THREE PHASE WIRING DIAGRAM



480V THREE PHASE WIRING DIAGRAM



CONTINUATION OF WIRING DIAGRAMS FROM ABOVE



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	
DATE 04/26/2018	DWG. # WW2GTFM
DRAWN BY: R.R.B.	
REV. 0	

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:
03-08-21	AS NOTED

WET WELL/VALVE BOX LAYOUT

