

# Lift Station No. 87 Project Team Meeting

Lift Station No. 87 Discipline  
Design Memorandum Findings Review

City of Sarasota, City Hall Annex, 1565 First Street  
Monday, November 25, 2013



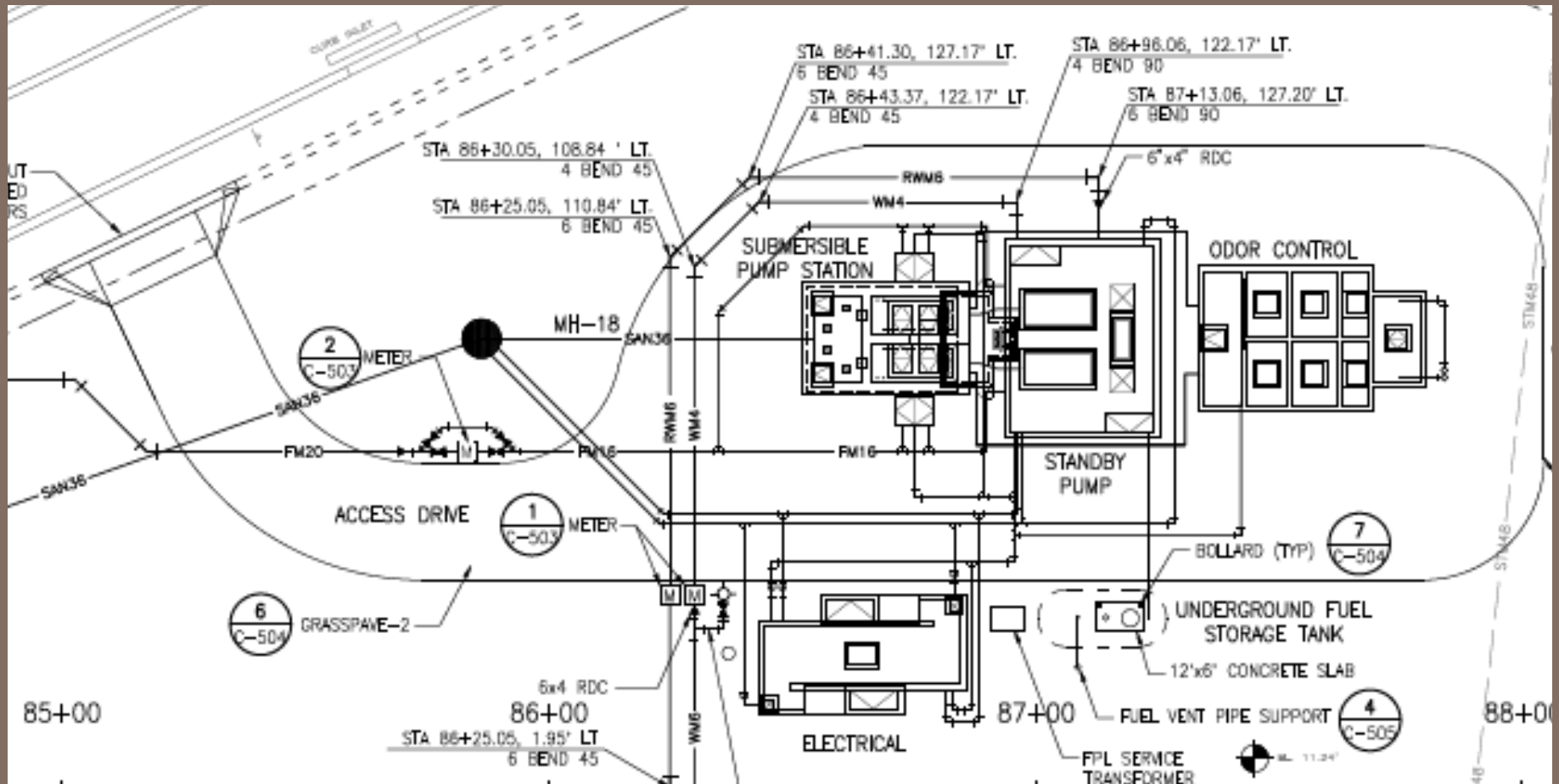
# Discipline Design Memorandums

- Architecture
- Building Permit
- Civil-Mechanical
- Constructability Review
- Electrical
- Fire Suppression
- Flood Elevation
- Force Main
- HVAC
- I&C
- Plumbing
- Sequence of Construction
- Structural
- Wastewater Flow

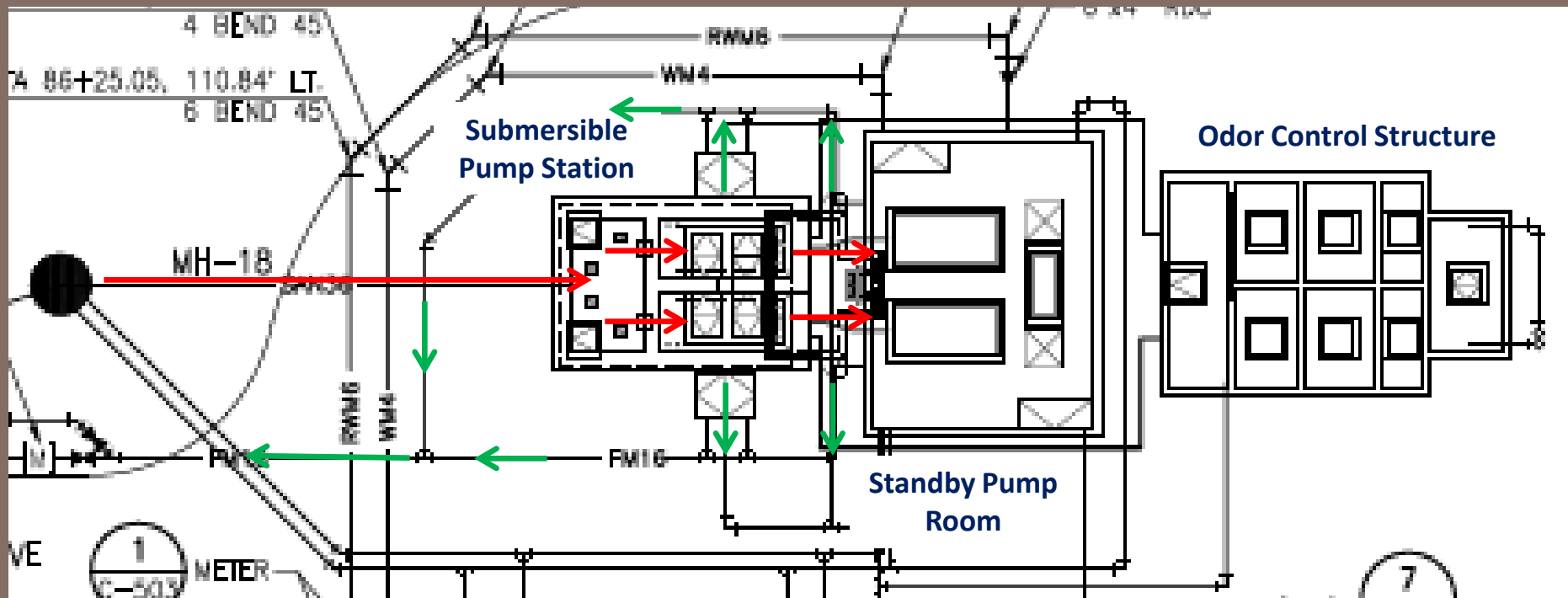
## Lift Station No. 87

- Submersible Pump Station Structure or SPSS
- Standby Pump Room Structure or SPRS
- Electrical Room Structure or ERS
- Odor Control Structure or OCS

# Lift Station No. 87 Site Plan



# Lift Station No. 87 Flow Path



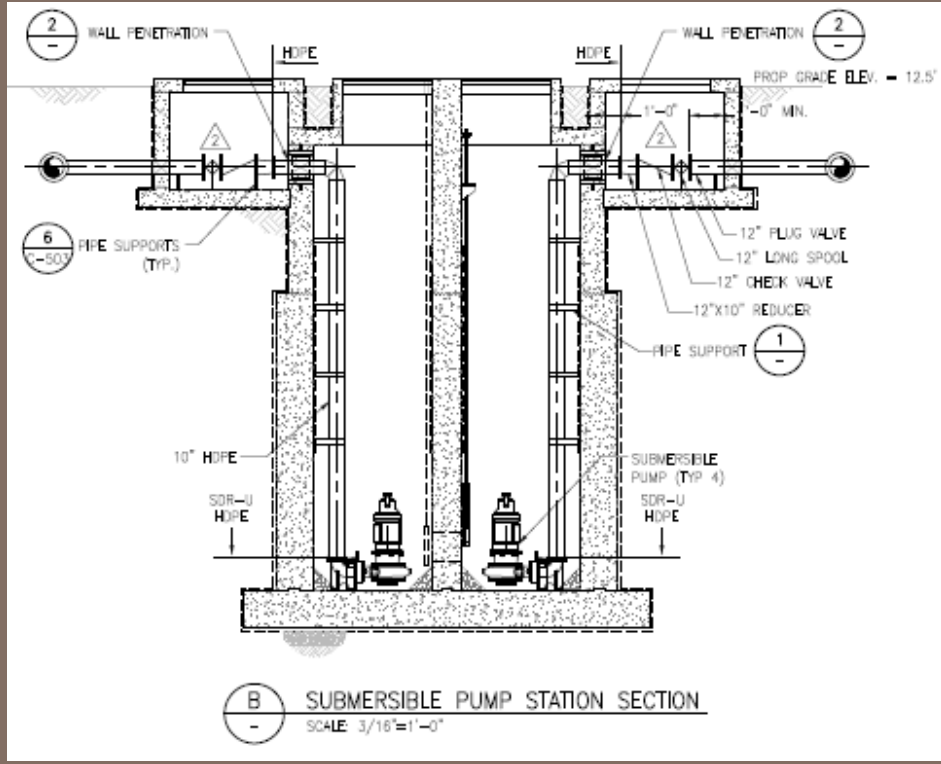
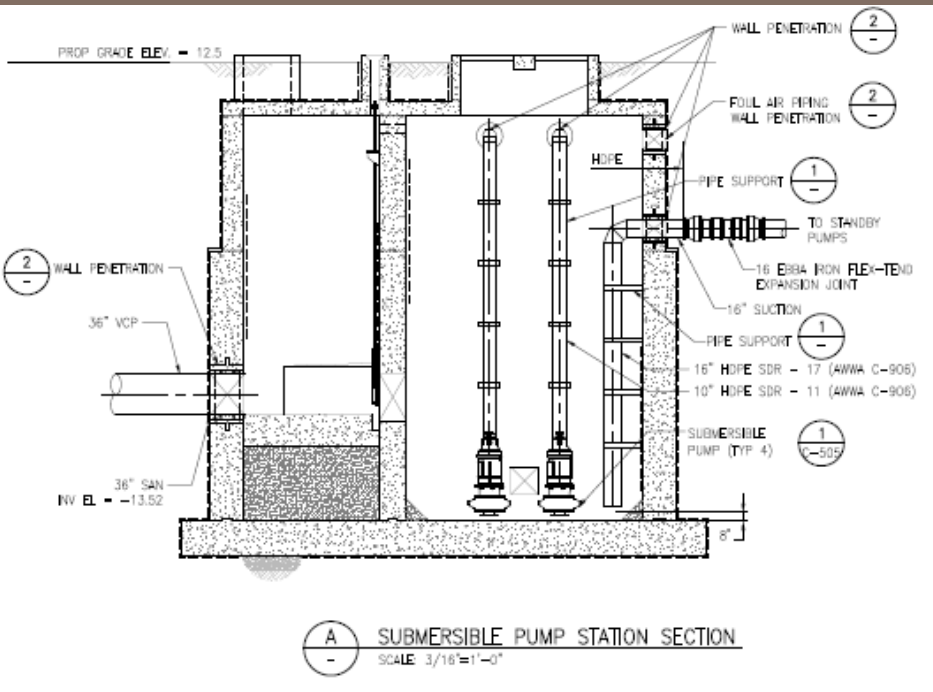
Electrical Room

Legend

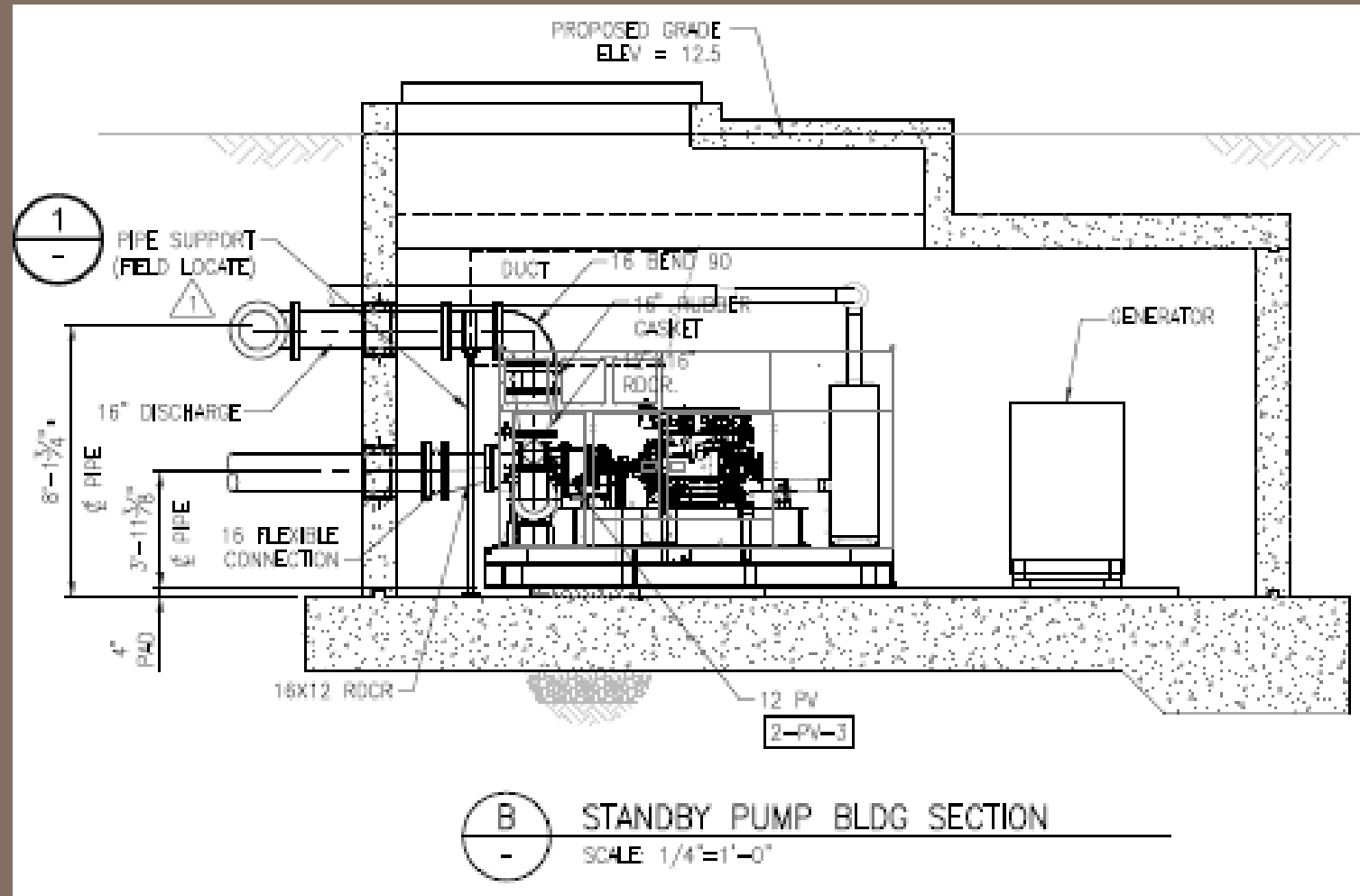
→ Gravity Flow

→ Pressure Flow

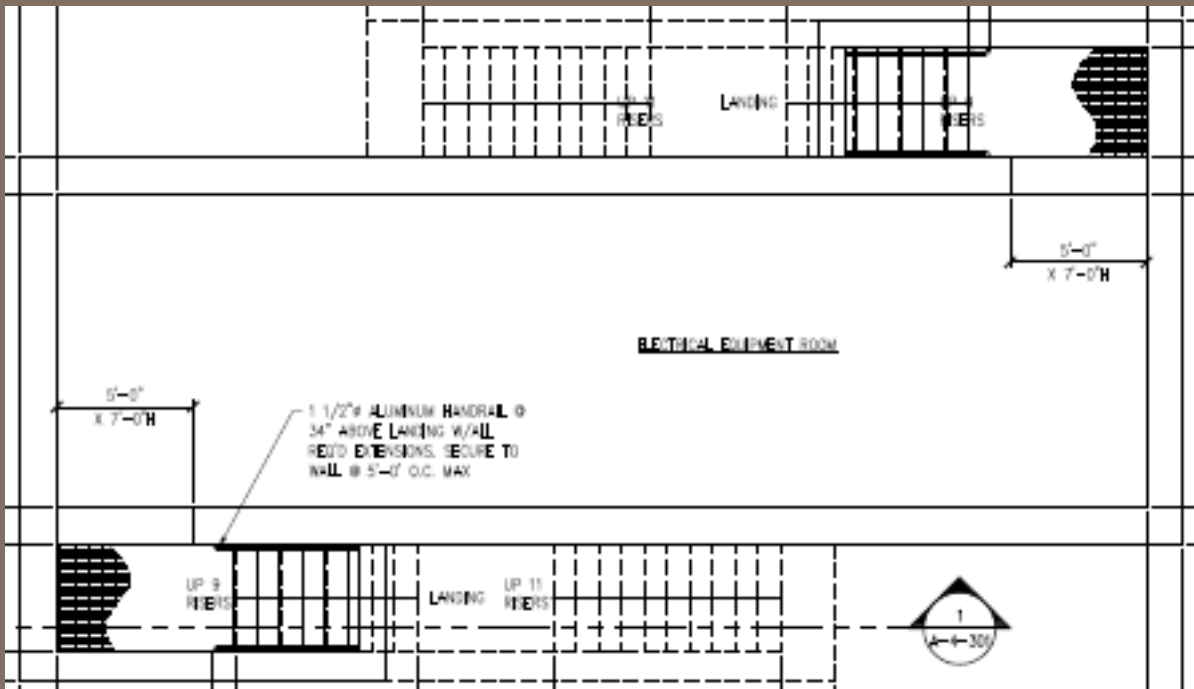
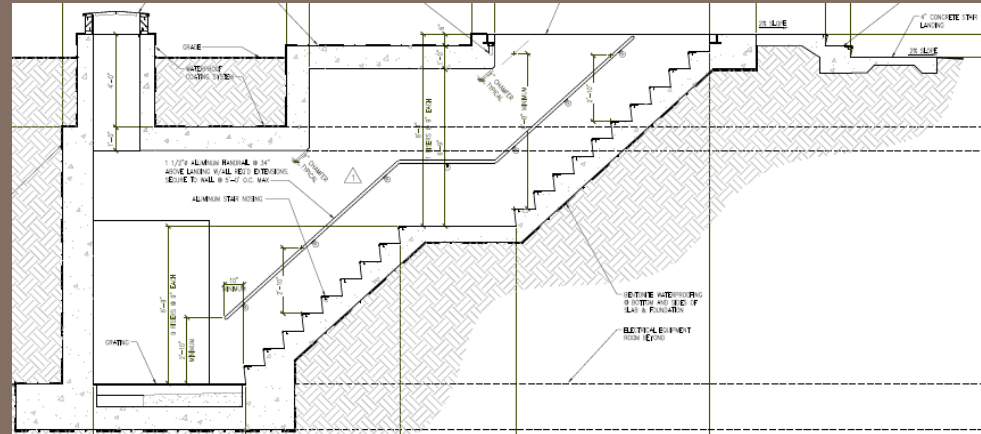
# Submersible Pump Station



# Standby Pump Room

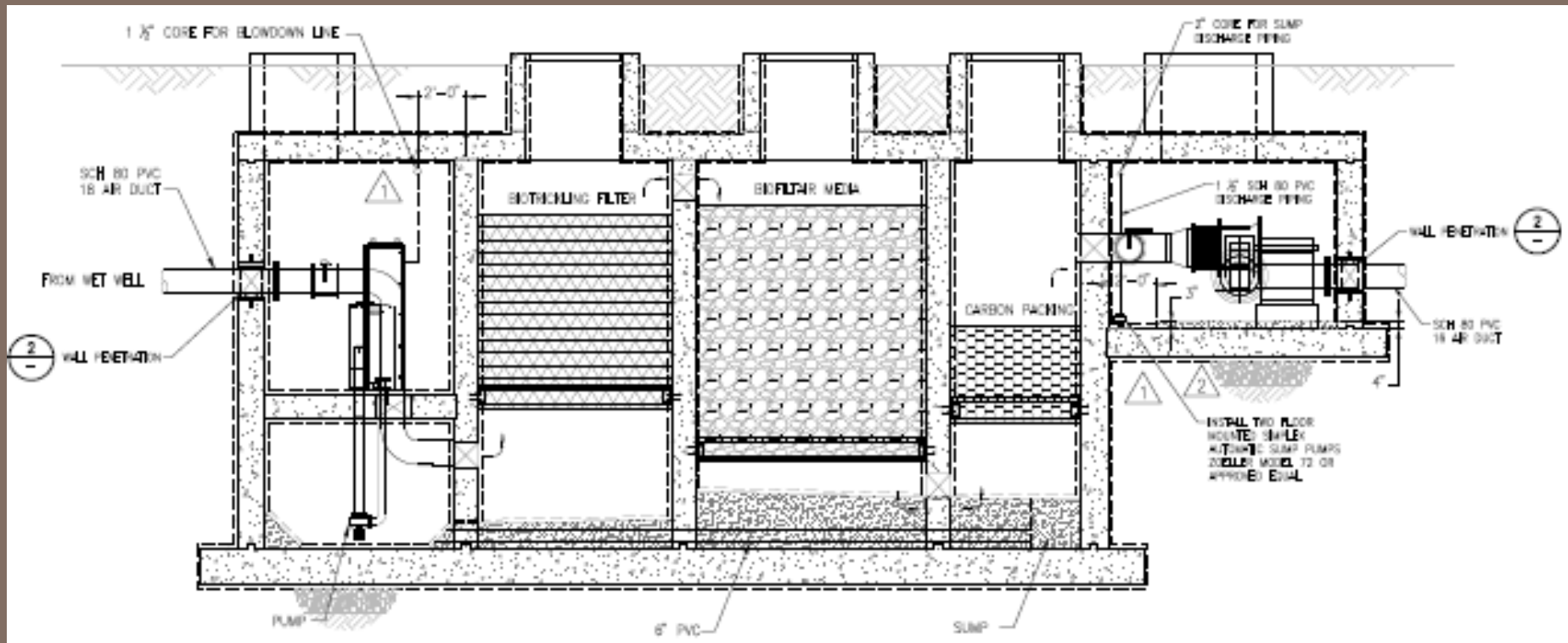


# Electrical Room





# Odor Control Structure



# Design Flows

- **Average Daily Flow (ADF):** The average of the daily flow volumes for the period under consideration. The ADF is calculated as the sum of the daily flows for the period under consideration divided by the total number of days in the period.
- **Peak Hourly Flow (PHF):** The single largest volume of flow to be received during a one hour period for the overall time period under consideration. Calculated as the actual peak hour or the average daily flow times a peak factor based on the Recommended Standards for Wastewater Facilities. Includes normal infiltration for systems built with modern construction techniques.
- **Extreme Wet Weather Flow (EWWF):** The peak hour flow rate adjusted for extreme wet weather inflow and infiltration. Calculated as the actual peak hour flow or peak hour flow plus system surcharge, sanitary sewer overflow volume, and other wet weather effects. It should be noted that the  $PHF = EWWF$  when inflow and infiltration (I&I) is within a 'normal' range.

# Lift Station No. 87 Flow Evaluations

- *Lift Station No. 7, Alternatives for Relocating or Flow Reduction Technical Memorandum*, Malcolm Pirnie, April 2006
- *LS 87 Alternative Sites Evaluation*, Stantec, August 2007
- *Basis of Design Report Lift Station 87*, Boyle/AECOM, April 7, 2009
- *Addendum #1*, City of Sarasota/AECOM, December 15, 2010
- *City of Sarasota Master Plan for the Rehabilitation and Improvement of the Wastewater Collection System*, Appendix C - Lift Station Information, March 2011, Stantec/City of Sarasota, May, 2012
- *Wastewater Flow Design Memorandum*, McKim & Creed, 2013

# Lift Station No. 87 Flow Evaluations

	LS No. 7			LS No. 71			LS No. 87		
	ADF	PHF	EWWF	ADF	PHF	EWWF	ADF	PHF	EWWF
	gpm (MGD)	gpm (MGD)	gpm (MGD)	gpm (MGD)	gpm (MGD)	gpm (MGD)	gpm (MGD)	gpm (MGD)	gpm (MGD)
<b>Malcolm Pirnie</b>	1,875 (2.70)	6,563 (9.45)	-	-	-	-	-	-	-
<b>Stantec</b>	1,852 (2.67)	2,221 (3.20)	6,421 (9.25)	7 (0.01)	-	-	1,859 (2.68)	-	-
<b>Boyle/ AECOM</b>	1,852 (2.67)	2,221 (3.20)	6,421 (9.25)	63 (0.09)	284 (0.41)	284 (0.41)	1,915 (2.76)	2,505 (3.61)	6,705 (9.66)
<b>Sarasota/ AECOM</b>	-	-	6,671 (9.60)	-	62 (0.09)	62 (0.09)	-	-	6,733 (9.69)
<b>Stantec</b>	-	-	6,671 (9.60)	-	-	62 (0.09)	-	-	6,733 (9.69)
<b>McKim &amp; Creed (2013)</b>	1,600 (2.30)	4,144 (5.98)	6,617 (9.53)	37 (0.05)	145 (0.21)	200 (0.29)	1,637 (2.36)	4,289 (6.18)	6,817 (9.82)
<b>McKim &amp; Creed (2030)</b>							1,656 (2.4)	4,362 (6.28)	6,891 (9.92)

# Lift Station No. 87 Design Flow Findings

- Various flow estimates appear within a reasonable margin of error
- Wastewater Flow Design Memorandum corroborates the Boyle/AECOM peak design flow of 6,705 gpm (9.66 MGD)
- Operating protocol is designed to step through the submersible pumps (at 1,500 gpm each) one at a time
- When excessive storm events are experienced one of the direct drive diesel pumps will be activated (at 5,000 gpm)

# Lift Station No. 87 Design Flow Findings

- Preliminary hydraulic modeling analysis of the downstream transmission system results in a total firm pump capacity of:
  - 10,065 gpm (14.48 MGD) at 127 feet of TDH with no other stations operating
  - 7,829 gpm (11.26 MGD) at 134 feet of TDH when LS 16 and LS 17 are operating
- Lift Station No. 87 appears to have a larger capacity than basis of design flow of 9.66 MGD

# OSHA/Entry Requirements

OSHA has requirements for practices and procedures to protect employees in general industry from the hazards of entry into permit-required confined spaces.

Structure	Confined Space	Fall Protection	Entry Requirements	Recommendations
Submersible Pump Station Structure	Yes	Missing	Annually	Install/upgrade fall protection system
Standby Pump Room Structure	No	Missing	Daily	Install/upgrade fall protection system
Electrical Room Structure	No	Missing	Daily	Install/upgrade fall protection system
Odor Control Structure	Yes	Missing	Daily	Redesign and reclassify as non-permitted confined space and install/upgrade fall protection system

# Lift Station No. 87 Select Findings

Item No.	Issue/Deficiency Identified	Location/Structure	Recommendation	Design Memorandum
1	Pumping system as designed has not been modeled with the force main system	General	Conduct a hydraulic model of the pressure system	Civil-Mechanical
2	No voice communications is possible between underground structures	General	Provide wireline communications between structures and to central monitoring site or phone service	Electrical
3	Several valve vaults access hatch covers were not closing properly	General	Realign hatch doors and tighten hinge bolts, if this does not work replace hinges	Structural
4	The underground storage tank in its current condition cannot support H2O vehicular load	Electrical Room Structure	The underground storage tank perimeter adjacent to access drive should be delineated with landscaping or other means appropriate for the site to prevent unintentional overloading	Structural
5	All four stairs access hatch covers leaked during rain storms	Standby Pump Room Structure and Electrical Room Structure	Replace all four hatch covers with Type L covers by Bilco or equal	Structural
6	Stair access hatches did not have fall prevention when opened	Standby Pump Room Structure and Electrical Room Structure	The Bilco or equal hatch covers should have fall prevention	Structural
7	Operators have no indication of the presence of dangerous levels of H2S gas	Standby Pump Room Structure and Electrical Room Structure	Install H2S analyzers	I&C



# Lift Station No. 87 Select Findings

Item No.	Issue/Deficiency Identified	Location/ Structure	Recommendation	Design Memorandum
8	Wetwell Elevation	Submersible Pump Station Structure	Confirm elevation and lower the wetwell floor as required	Civil-Mechanical
9	Influent Pipe/Pump Orientation	Submersible Pump Station Structure	Realign the orientation of the influent pipe	Civil-Mechanical
10	Odor Control Structure Access	Odor Control Structure	Redesign and reclassify as non-permitted confined space and install/upgrade fall protection system	Civil-Mechanical
11	Odor Control Equipment Sizing	Odor Control Structure	Confirm sizing of system with increased wetwell volume	Civil-Mechanical