Pump Station City No. 6 Gravity Sewer and Pump Station Improvements Technical Design Report

Coral Gables, FL

Prepared for:

City of Coral Gables
Coral Gables, FL 33134

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This item has been digitally signed and sealed by Kevin E. Gerszuny, PE, on 05/19/2023.

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KEVIN E. GERSZUNY LICENSE No 93169 STATE OF FLORIDA PROFESSIONAL ENGINEER

Executive Summary

On March 17, 2022, Maple Multi Family Land SE, L.P. (Client) authorized Kimley-Horn and Associates, Inc. to provide professional engineering services to design the upgrades to City of Coral Gables (City) Pump Station City No. 6.

The pump station upgrades are necessary as the City of Coral Gables anticipates additional sewer flow due to a new 7-story apartment development located at northwest corner of Malaga Avenue and Salzedo Street. The City performed a hydraulic sewer modeling analysis to determine the amount of total sewer flows anticipated for the pump station (Refer to Appendix A for the hydraulic analysis technical memorandum).

Pump Station City No. 6 is located at the intersection of Camilo Avenue and Ponce de Leon Boulevard in Coral Gables, Florida. The existing pump station is a concrete duplex submersible wetwell configuration with a 4-inch valve assembly. The pump station discharges to an existing 6-inch force main manifolded to the City's 36-inch force main located at the intersection of Cadima Avenue and Ponce De Leon Boulevard.

The City decided that a new wetwell and valve assembly will be required following coordination on various alternatives to upgrade the existing pump station. The existing pump station wetwell will be grouted and abandoned, and its associated valve assembly will be removed.

The following summarizes the proposed design parameters

- Proposed Pump Station Design Parameters:
    - Estimated Sewer Influent Flow:
        - Average Daily Flow: 144 GPM
        - Peaking Factor: 4.0
        - Peak Hourly Flow: 576 GPM
    - Pump Selection:
        - (2) Flygt Submersible Pumps - Model FP 3153 HT 3~464
            - Non-Clog, Chopper Style
            - Horsepower: 20 HP
    - Proposed Pumps Operating Point:
        - Peak Pressure System Conditions: 580 GPM @ 60 FT TDH
        - Minimum Pressure System Conditions: 790 GPM @ 44 FT TDH
    - Wetwell Design:
        - Wetwell Inside Diameter: 8 FT
        - Operating Volume: 1,130 gallons
        - Number of Cycles per hour per pump during average daily flow: 2.25 Cycles
        - Number of Cycles per hour per pump during peak hourly flow: 0.11 Cycles

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Introduction

The City of Coral Gables is replacing an existing Pump Station City 6 for a new prefabricated HDPE pump station. The new pump station will be capable of pumping the additional sewer flows associated with a proposed seven-story mixed use development yielding 262 residential units and 21 live-work units. The new development is located at the northwest corner of Malaga Avenue and Salzedo Street.

Due to sewer capacity limits of the existing sewer system, a new 12" PVC C-900 gravity sewer main will be constructed to convey the sewer from the proposed development to the proposed Pump Station City 6. Along the new proposed sewer main alignment on Salzedo Street, the existing sewer will be connected to the proposed 12-inch sewer main. This configuration will redirect sewer from Malaga Avenue, Santander Avenue, and San Sebastian Avenue from the City's Sewer Basin 2 to Sewer Basin 6.

Refer to Figure 1 for project scope map.

The sewer will be pumped downstream via a new 8-inch force main, designed and permitted by others, connecting to an existing City of Coral Gables owned 36-inch force main downstream of the pump station.

Figure 1: Project Scope Map

Existing System Conditions

The existing sanitary sewer system adjacent to the proposed development site is located along Malaga Avenue in between Lejeune Road and Salzedo Street. The existing sewer system conveys sewer from the existing residences along this street to Pump Station City 2.

As part of this project, the City determined that the existing adjacent sewer system cannot receive additional flows from the proposed development. Multiple alternatives were evaluated, however the City agreed that the proposed development's sewer can be routed to Pump Station City 6.

Hence, improvements to the existing gravity sewer and pump station are required and detailed below.

Proposed Gravity Sewer and Pump Station Design

The overall proposed system design includes the following:

1. Construction of approximately 2,610 linear feet of 12" PVC C-900 DR 18 gravity sewer main connecting the proposed development to the new City 6 wetwell.
2. Construction of approximately 76 linear feet of 10" PVC C-900 DR 18 gravity sewer main connecting to the proposed 12" sewer main.
3. Construction of approximately 40 linear feet of 8" PVC C-900 DR 18 gravity sewer main connecting to the proposed 12" sewer main.
4. Construction of a new pump station wetwell and valve assembly
5. Abandonment of existing City 6 Pump Station.

Sewer Calculations

As a basis for design, the proposed peak hourly flow for the proposed gravity sewer system was provided by the City of Coral Gables and used for design.

- Summary of Design Criteria:
    - Average Daily Flow
        - Full Buildout Conditions: 144 GPM
    - Peaking Factor: 4.0
    - Peak Hour Flow
        - Full Buildout Conditions: 576 GPM

Refer to Appendix A for reference.

Pump Station Design Criteria

System Curve

The peak hourly flow was used as the basis for the minimum pumping capacity of the proposed pumps. A total dynamic head (TDH) was calculated for the proposed flow and pressure conditions. The equivalent length method was used to determine the friction loss due to the pipe and appurtenances, and a Hazen Williams coefficient of 120 was assumed. This friction loss, as well as the point of connection pressures were then added to the total static head to develop a system curve of the flow versus the TDH.

Two system curves were developed, one for minimum pressure and one for maximum pressure at the point of connections. The pump operating design points were evaluated at the point of intersection with these two system curves.

Refer to Appendix B, Step B – E

- Pressure at Point of Connection (POC) to existing 36-inch force main
  - Peak Pressure System Conditions: 41.7 FT
  - Minimum Pressure System Conditions: 20.8 FT

Pump Selection

Based on the results of the calculations detailed above, the selected operating points and pump selection information is below:

- Pump Selection:
  - (2) Flygt Pump Model FP 3153 HT 3~464
    - Chopper Style
    - Horsepower: 20 HP

- Proposed Pumps Operating Point:
  - Peak Pressure System Conditions: 580 GPM @ 60 FT TDH
  - Minimum Pressure System Conditions: 790 GPM @ 44 FT TDH

The pump shop drawing information is shown in Appendix C.

Wetwell Cycle Times

Once the design points were selected, a wetwell operating volume was calculated based on the wetwell cycle times. The cycle times meet FDEP regulations and the pump manufacturer's recommendations.

- Wetwell Diameter: 8 FT
- Operating Range: 3 FT
- Depth of Wetwell: 18.38 FT
- Elevations:
  - Rim: 13.38 FT
  - Sewer Pipe Invert: 2.74 FT
  - High Level Alarm: 2.24 FT
  - Lag Pump On: 1.24 FT

- Lead Pump On: 0.74 FT
- Pumps Off: -2.26 FT
- Bottom of Wetwell: -5.00 FT

Cycle times were evaluated at both operating conditions as a check that the wetwell and pump cycles were within recommended ranges. The conditions evaluated are presented below:

- Minimum influent sewer flow with minimum system pressure (790 GPM Pumping Rate)
  - Number of pump starts per hour per pump: 2.25 cycles
  - Filling Time: 11.71 minutes

- Peak hourly influent sewer flow with peak system pressures (580 GPM Pumping Rate)
  - Number of pump starts per hour per pump: 0.11 cycles
  - Filling Time: 1.96 minutes

At either condition, the wetwell filling time is less than 30 minutes and as recommended by Ten State Standards Section 42.62. The number of pump starts per hour is less than 30 as recommended per the pump manufacturer.

Refer to Appendix B, Step F - G

Valve Assembly Design
A new valve assembly will be constructed in a precast concrete vault. The velocities at peak pumping capacity are shown below and withing recommended pipe velocity ranges.

- Valve Assembly Design Parameters:
  - Velocity in Proposed 8-Inch Valve Assembly
    - Peak Pumping Rate (790 GPM): 5.1 ft/s
    - Minimum Pumping Rate (580 GPM): 3.8 ft/s

Maintenance and Reliability

Wetwell Considerations

- Top slab of wetwell is elevated 6-inches above grade, located within Flood Zone X per FEMA FIRM Map 12086C0457L..
- The wetwell is made of HDPE, an inert material that can withstand hydrogen sulfide gases typically found in sewer systems.
- A passive vent pipe to allow gases to disperse to the atmosphere will be provided.
- All piping inside the wetwell will be HDPE DR 17 as well to prevent corrosion from gases.
- All piping supports will be made of 316 stainless steel.

Valve Vault Considerations

- Top slab of valve vault is elevated 6-inches above grade, located within Flood Zone X per FEMA FIRM Map 12086C0457L..
- The valve vault is provided with a pump out assembly in case that the pumps are offline for

maintenance.
- A sump will be provided to maintain the vault dry.
- Isolation valves are provided for each pump header in case a pump needs to go offline for maintenance.

Electrical/Controls Considerations
- The pump station will operate based on a level pressure transducer as the primary controls. In case of transducer failure, level floats will be used a backup control mechanism.
- Pump control panel will be specified for 316 stainless steel NEMA 3R construction.
- Control panel will be specified with a generator plug receptacle.

Electrical and Instrumentation & Controls Design

Electrical Scope of Work Summary
- Existing 120/240V, 3-phase, 4-wire electrical service to remain.
- Install a new FPL meter. Relocate existing service to new meter location.
- Install new main disconnect safety switch with fuses.
- Install new control panel with a main and emergency circuit breaker.
- Install new Multismart pump controller with associated SCADA instrumentation.
- Install pressure transducer in the wet well to monitor well levels and operate pumps.
- Install all power and control wiring, raceways, grounding and surge protection system to provide a complete and working system.
- Install new service receptacles.
- No stand-by generator required.

Future Electrical Needs
The existing 120/240V, 3-phase electrical service will remain. The pump station will require a new FPL power meter, main disconnect safety switch with fuses, control panel, raceways, wiring, and grounding system. There is no standby emergency power generator at this location.

FPL Power:
The demand of FPL services will include continuous run of two pumps together. Electrical Service to withstand utility available fault current and built as per FPL standard.

Standby Power:
This station currently does not have a stand-by generator set in the event of primary power failure and one is not required. The control panel will come with a portable generator hook up connection.

Pump Station Control Panel:
Provide Hand-Off-Remote control interface to allow for the control of the pump station locally in hand, and remotely via the SCADA system. New control panels shall have all the necessary interface relays, switches, light indicators, alarms and interface terminals for field control devices necessary to control the pumps. Critical alarm conditions will be as prescribed by the City of Coral Gables.

SCADA System:

A new SCADA controller will be installed at the site. A Multismart controller will serve as the master pump controller and will be located inside the control panel. An analog 4-20 mA signal from a submersible pressure transducer will serve as the primary levels control system for the pumps. A secondary, backup pump controller is provided inside the control panel and is connected to level floats to control the station in the event of a master pump controller failure.

The SCADA System continuously monitors the following parameters:

- Operating hours after midnight for each sewage pump, total pump station operating hours after midnight, and number of pumps starts
- Wet well level with high and low-level alarm set points.
- Kilowatts calculated from Pump Station amperage.
- Flow (instantaneous and average) determined from flow calculated based on pump(s) amperage and discharge pressure.
- Discharge pressure with high and low-level alarm set points.
- Minimum digital inputs, including high water level alarm in wet well, drywell flooding, intrusion alarm, A.C. Pump Station power failure, D.C. low battery and remote signal failure alarm.
- The SCADA pressure transmitter is located on the 8-inch discharge piping in the valve vault.

A controls junction box will be installed near the wet well. The junction box will contain terminal blocks to connect the pressure transducer and floats to the control panel's conductors.

Force Main Design

The proposed pump station will connect to a proposed 8-inch force main that be designed and permitted by others. The proposed 8-inch PVC force main will extend approximately 470 ft to the south and connect to an existing 36-inch force main.

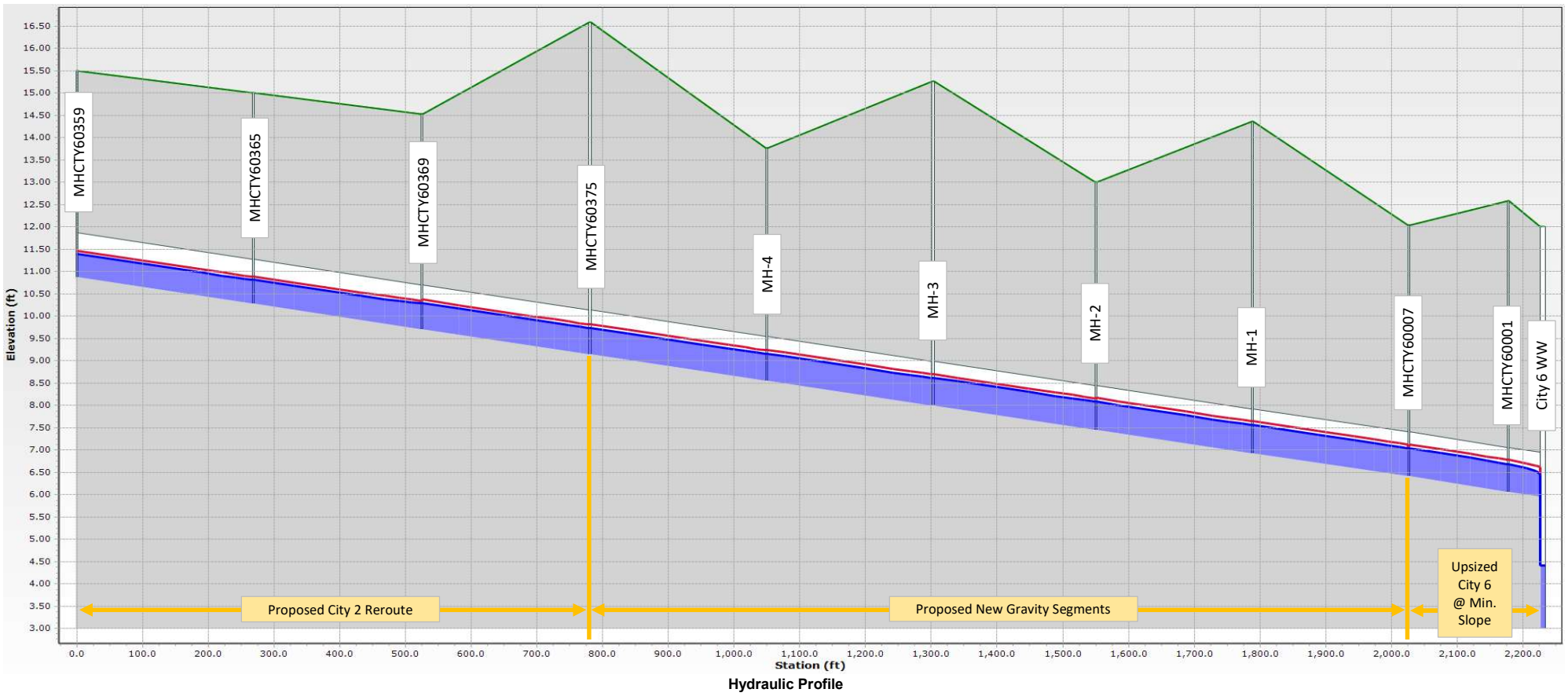
- Force Main Design Parameters:
    - Velocity in Proposed Force Main
        - Peak Pumping Rate (790 GPM): 5.1 ft/s
        - Minimum Pumping Rate (580 GPM): 3.8 ft/s

APPENDIX A:
Hydraulic Sewer Analysis

Alexan Craft Preliminary Downstream Gravity Capacity Analysis - Revised January 2022

Scenario 5 - Flows: City 2 Reroute (Less Catalonia Ave) w/ Septic Addition, Peak Ch 24, **Pipes:** Upsized 12-inch Pipes Down Salzedo

Pipe Segment	Upstream Manhole	Downstream Manhole	Diam. (in)	Manning's n-value	Length (ft)	EL Crown of Pipe (Start)	EL Crown of Pipe (Stop)	Slope	Hydraulic Grade Line (Start)	Hydraulic Grade Line (Stop)	Surcharge (start)	Surcharge (stop)	Flow (gpm)	Fullness of Pipe	Notes
SSCTY60359	MHCTY60359	MHCTY60365	12	0.013	268	11.86	11.27	0.22%	11.39	10.81	No (okay)	No (okay)	415	53.5%	Segment data projected based on downstream upsized City 6 system
SSCTY60365	MHCTY60365	MHCTY60369	12	0.013	256	11.27	10.70	0.22%	10.81	10.29	No (okay)	No (okay)	429	56.5%	Segment data projected based on downstream upsized City 6 system
SSCTY60369	MHCTY60369	MHCTY60375	12	0.013	256	10.70	10.14	0.22%	10.29	9.74	No (okay)	No (okay)	487	59.5%	Segment data projected based on downstream upsized City 6 system
SS-375	MHCTY60375	MH-4	12	0.013	269	10.14	9.55	0.22%	9.74	9.16	No (okay)	No (okay)	497	60.5%	Segment data projected based on downstream upsized City 6 system
SS-4	MH-4	MH-3	12	0.013	253	9.55	8.99	0.22%	9.16	8.61	No (okay)	No (okay)	516	61.5%	Segment data projected based on downstream upsized City 6 system
SS-3	MH-3	MH-2	12	0.013	248	8.99	8.45	0.22%	8.61	8.08	No (okay)	No (okay)	532	62.5%	Segment data projected based on downstream upsized City 6 system
SS-2	MH-2	MH-1	12	0.013	238	8.45	7.92	0.22%	8.08	7.56	No (okay)	No (okay)	547	63.5%	Segment data projected based on downstream upsized City 6 system
SS-1	MH-1	MHCTY60007	12	0.013	238	7.92	7.40	0.22%	7.56	7.04	No (okay)	No (okay)	551	64.0%	Segment data projected based on downstream upsized City 6 system
SSCTY60007	MHCTY60007	MHCTY60001	12	0.013	152	7.40	7.06	0.22%	7.04	6.68	No (okay)	No (okay)	561	63.0%	Segment data projected based on downstream upsized City 6 system
SSCTY60001	MHCTY60001	City 6 WW	12	0.013	52	7.06	6.95	0.21%	6.68	6.43	No (okay)	No (okay)	576	55.0%	Segment start EL based on as-builts -- upsized to 12", and min. slope selected



Hydraulic Profile

Scenario 5 Summary

Segments Anticipated to sucharge =	0
Segments Not Anticipated to Surcharge =	10
Total Downstream Segments =	10

Scenario 5 Notes:

1. The downstream-most invert elevation (i.e. the influent elevation at PS City 6) is based on the EXISTING wet well influent elevation. This elevation could potentially be modified/lowered, particularly if the station/wet well is upgraded, which would allow for greater cover in the upstream system. All upstream invert elevations are calculated based off the existing influent elevation; if the existing influent elevation is lowered, the upstream invert elevations could be brought down which

2. Please note that the rim/grade elevations for existing manholes are based on the as-built records from the 1950s and 1960s. For the new manholes, rim/grade elevations are based on the County's 2018 DEM/LiDAR data. Based on these grade elevations, it is estimated that the gravity segments shown/modeled will have at least 3.5 feet of cover.
Actual rim/grade elevations may vary. A survey would be needed to confirm grade elevations in the area.

3. With the selected 12-inch diameter pipes at the minimum slope of 0.22%, the downstream gravity system has capacity available for future connections. All pipes are expected to be less than 65% full under peak flow conditions.

4. The 0.22% sloped 12-inch pipes provide slightly better cover than the 0.28% sloped 10-inch pipes, however cover in the upstream portion of the system is still somewhat limited. As such, there would be limited potential to reroute any additional portions of the City 2 basin to PS City 6.

5. Please note, the existing pumps at PS City 6 do **NOT** have the capacity to accommodate the proposed flows from Alexan Craft, the rerouted City 2 basin and the septic addition. **The pumps would need to be upsized in this scenario.** The modeled conditions reflect "placeholder" pump units that have adequate capacity so that the capacity of the gravity system can be evaluated.

Hazen

Pump Station City 6
Preliminary Pressure Analysis - February 2022

Scenario	Acceptable? (Y/N)	Operating Point		Pressure at POC to 36" FM (ft)	Pump	Assumed Invert EL of Pump Discharge (ft NGVD)	Discharge FM Size (in)	Velocity (fps)	Assumed C Value	MDWASD Backpressure at POD (ft)	Assumed EL of POD (ft NGVD)	Scenario Description	Notes
		Flow (gpm)	TDH (ft)										
1 - Existing Peak Syst	No	133	53.1	41.7	Existing	5.0	4	3.39	100	40.4	11.7	Existing pumps, existing FM, peak manifolded system pressure	Flow achieved by existing pump not adequate to accommodate proposed gravity system PHF of 576 gpm
2 - Existing Min Syst	No	203	46.4	20.8	Existing	5.0	4	5.19	100	10.3	11.7	Existing pumps, existing FM, min manifolded system pressure	Flow achieved by existing pump not adequate to accommodate proposed gravity system PHF of 576 gpm
3 - Prop Pumps, 4" FM, Peak Syst	No	634	253.8	41.9	Proposed	5.0	4	16.19	100	40.4	11.7	Proposed pumps, existing FM, peak manifolded system pressure	Excessive head loss and velocity through existing 4" FM
4 - Prop Pumps, 4" FM, Min Syst	No	1,268	796.5	20.8	Proposed	5.0	4	32.37	100	10.3	11.7	Proposed pumps, existing FM, min manifolded system pressure	Excessive head loss and velocity through existing 4" FM
5 - Prop Pumps, 8" FM, Peak Syst	Yes	634	48.6	41.9	Proposed	5.0	8	4.05	120	40.4	11.7	Proposed pumps, proposed 8" FM, peak manifolded system pressure	
6 - Prop Pumps, 8" FM, Min Syst	Yes	1,268	46.0	20.8	Proposed	5.0	8	8.09	120	10.3	11.7	Proposed pumps, proposed 8" FM, min manifolded system pressure	If actual design flow significantly >1,268 gpm, velocity through proposed 8" FM may exceed acceptable range
7 - Prop Pumps, 10" FM, Peak Syst	Yes	634	44.3	41.9	Proposed	5.0	10	2.59	120	40.4	11.7	Proposed pumps, proposed 10" FM, peak manifolded system pressure	
8 - Prop Pumps, 10" FM, Min Syst	Yes	1,268	29.9	20.8	Proposed	5.0	10	5.18	120	10.3	11.7	Proposed pumps, proposed 10" FM, min manifolded system pressure	A 10" FM would reduce excessive head losses through discharge FM piping

ASSUMPTIONS

1. The proposed pumps are assumed to operate at 634 gpm under peak system conditions, which represents 1.1x the estimated gravity system PHF (576 gpm).
2. The proposed pumps are assumed to operate at 1268 gpm under minimum system conditions, which represents 2x the assumed pump operating capacity under peak system conditions.
3. The assumed proposed pump flows (detailed in Items 1 and 2 above) represent reasonable estimates for the purpose of approximating system pressures. EOR to select proposed pump size/operating points; actual design flows selected by the EOR may differ from the estimates used here, and the hydraulic model may need to be updated to reflect design operating points.
4. Very limited as-built information is available for PS City 6 (see attached as-built). As such the elevation of the pumps is assumed and should be verified via survey. The exact configuration of the station discharge piping is unknown; reasonable assumptions have been made.
5. The existing pumps are presumed to be 10 hp Flygt model C-3127 unit (see attached pump curve).
6. The proposed City 6 gravity system upgrades were previously described in a separate analysis.
7. Based on the above preliminary pressure analysis, it is assumed that the existing discharge FM will need to be upsized.
8. C values of 120 are assumed to correspond to smooth pipe materials such as PVC, polyethylene, or lined ductile iron in accordance with FDEP "Notification//Application for Constructing a Domestic Wastewater Collection/Transmission System" application Item No. 82. If unlined ductile iron is selected for the proposed FM piping, the C value will need to be revised to 100.
9. All information shown here is PRELIMINARY and based on available records and reasonable assumptions. Actual proposed conditions may vary based on pump station and FM upgrades designed by the EOR, and actual existing conditions.

OTHER CONSIDERATIONS

If the PS City 6 pumps are upgraded, this will trigger DERM to evaluate whether the station is in compliance with all current DERM requirements, including but may not be limited to:

1. Sea Level Rise (SLR) - Based on the FEMA FIRM for the area, PS City 6 is located in Zone X and therefore is at minimal risk for flooding. Additionally, the County's Preliminary Flood Zones also placed PS City 6 within Zone X. As such, it is not anticipated that DERM would require any changes to electrical equipment elevation, or watertight wet well hatches, in order to meeting SLR requirements. Current and future flood maps are attached for reference.
2. ET Clocks - The station's electrical panel will be required to be upgraded to include the five (5) ET clocks, per DERM requirements.
3. Impacts on Manifolded Stations - PS City 6 transmits flows to the City's manifolded FM system. As such, an analysis of the existing and proposed operating conditions for other stations within the manifolded system will be required in order to demonstrate that the impacts on operating points and runtimes are minimal. This analysis can be completed using the City's hydraulic model.
4. Miscellaneous - DERM will require a wet well cycle time analysis. Depending on the configuration of the existing wet well/influent pipe and the design operating points of the proposed pumps, the existing wet well may or may not allow for reasonable/acceptable operating conditions with regard to wet well cycle times/control elevations.

This list is not meant to be a comprehensive list of all permitting requirements. Permitting requirements are to be evaluated by the EOR.

Additionally, various components of the existing station have surpassed/are approaching the end of useful life. As such, the City may require other upgrades to the station not detailed here.

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD 29). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevation table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevation table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Florida State Plane east zone (FIPSZONE 0901). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by the Miami-Dade County Information Technology Department. These data were compiled at a scale of 1:3,600 from digital orthophotography dated 2001. Additional base map information was provided by the Cities of Aventura, Coral Gables, and Homestead, the Town of Cutler Bay, and Miami-Dade County.

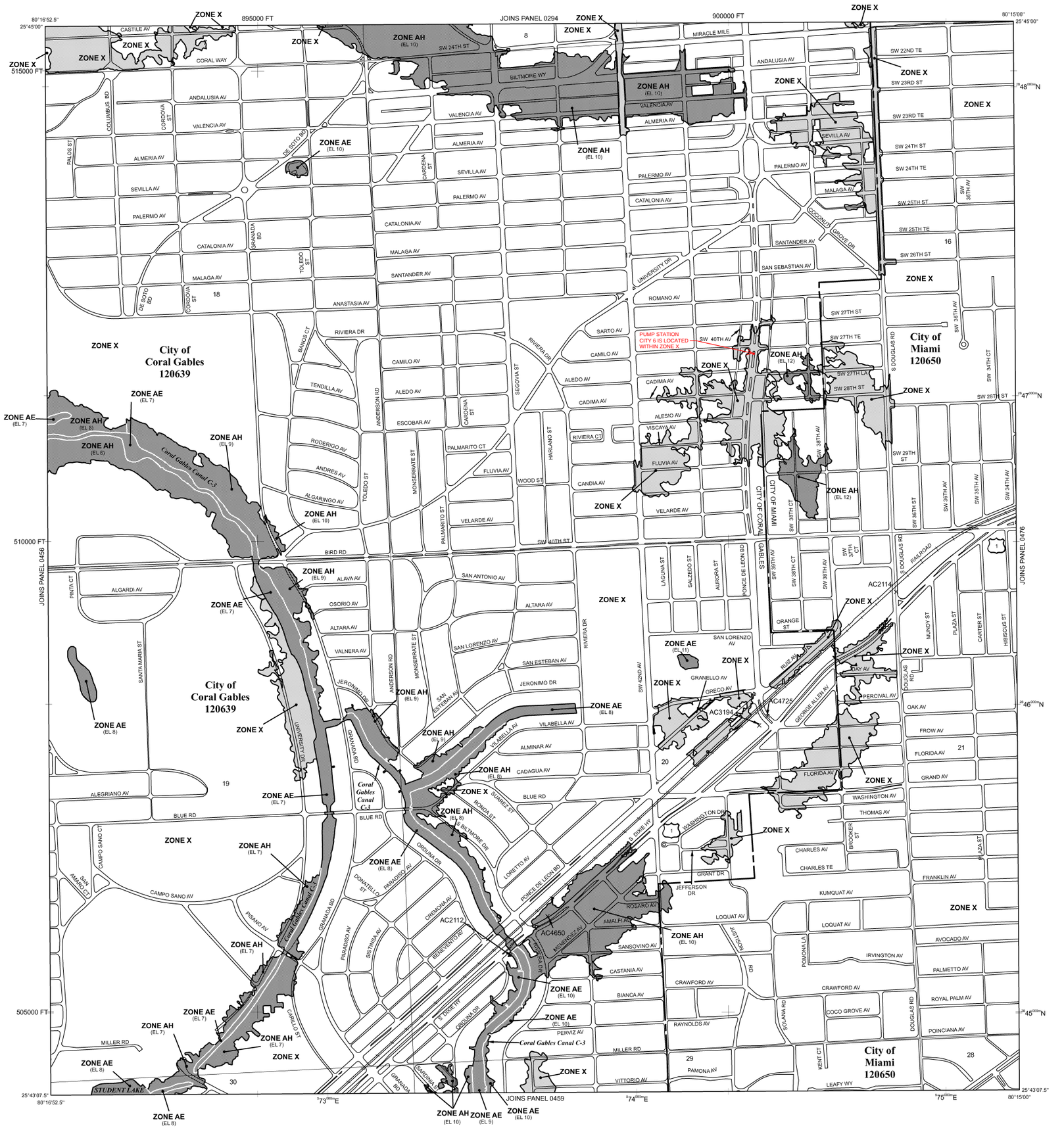
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the National Geodetic Vertical Datum of 1929

- A — A — Cross section Line
- 23 — 23 — Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 2776000mN — 1000-meter Universal Transverse Mercator grid values, zone 17
- 600000 FT — 5000-foot grid ticks: Florida State Plane coordinate system, East zone (FIPSZONE 0901), Transverse Mercator projection
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- ●M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 20, 1993

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
March 2, 1994 - May 16, 1994 - July 17, 1995 - for description of revision, see Notice to Users page in the Flood Insurance Study report.
September 11, 2009 - to add and change Base Flood Elevations, to change zone designations, to add roads and road names, to add and change Special Flood Hazard Areas, to reflect revised shoreline, to reflect updated topographic information, to incorporate previously issued Letters of Map Revision, and to update corporate limits

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0457L

FIRM

FLOOD INSURANCE RATE MAP

MIAMI-DADE COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 457 OF 1031

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CORAL GABLES, CITY OF	120639	0457	L
MIAMI, CITY OF	120650	0457	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12086C0457L

MAP REVISED
SEPTEMBER 11, 2009

Federal Emergency Management Agency

(3 of 3)

Preliminary Flood Zone - X

Zone: X
Elevation: -9,999
Zone Subtype: AREA OF MINIMAL FLOOD HAZARD

Zoom to

ROMANO AVE
SARTO AVE
CAMILO AVE
ALEDO AVE
CADIMA AVE
ALESIO AVE
VISCAYA AVE
SALZEDO ST
PONCE DE LEON BLVD
MONEGRO ST
SW 38TH AVE
SW 27TH ST
SW 28TH
SW 37TH CT
SW 42ND AVE

200ft

-80.260 25.741 Degrees

APPENDIX B:
Pump Station Design Calculations

Project Name: PS City No 6 Improvements
Location: Coral Gables, Florida
KHA Project Number: 043904007
Engineer: KEG
Revised:

LIFT STATION CALCULATIONS

A. Flow Estimate

1. Average Flows

207,360 GPD (ADF) (Estimated by City of Coral Gables)

$$\frac{207{,}360 \text{ GPD}}{24 \text{ Hours} \times 60 \text{ Min./Hour}} = 144.0 \text{ GPM}$$

2. Peak Flows

a peaking factor of 4 is used.

Peak flow = 144.0 GPM x 4 = 576 GPM

B. Equivalent Lengths of Pipe

Fitting	Equivalent Feet of Pipe — Pipe Size (inches)				
	2	4	6	8	10
Gate Valve	3	3	4	4	4
Plug Valve	3	6.2	9.3	12.2	15.4
Check Valve	19	38	52	74	98
Run Tee	0	3	4	4	5
Branch Tee	0	10	15	20	25
45 Degree	0	4	5	7	8
90 Degree	0	5	8	10	12
Reducer	3	4	5	8	10

1a. Equivalent lengths of pipe

Pump Discharge Riser

Pipe	20	LF of	8	Force main		=	20 LF
Gate Valve	0	-	8	Gate Valve (open) x	4 LF	=	0 LF
Plug Valve	0	-	8	Plug Valve (open) x	12.2 LF	=	0 LF
Check Valve	0	-	8	Check Valve (open) x	74 LF	=	0 LF
Run Tee	0	-	8	Run Tees x	4	=	0 LF
Branch Tee	0	-	8	Branch Tees x	20 LF	=	0 LF
45 Degree	0	-	8	45 degree elbows x	7 LF	=	0 LF
90 Degree	2	-	8	90 degree elbows x	10 LF	=	20 LF
Reducer	1	-	8	Reducers x	8 LF	=	8 LF
		Equivalent length of	**8**	**pipe based on C = 120**			**48 LF**

Valve Assembly + Force Main

Pipe	445	LF of	8	Force main		=	445 LF
Gate Valve	0	-	8	Gate Valve (open) x	4 LF	=	0 LF
Plug Valve	3	-	8	Plug Valve (open) x	12.2 LF	=	37 LF
Check Valve	1	-	8	Check Valve (open) x	74 LF	=	74 LF
Run Tee	0	-	8	Run Tees x	4	=	0 LF
Branch Tee	3	-	8	Branch Tees x	20 LF	=	60 LF
45 Degree	3	-	8	45 degree elbows x	7 LF	=	21 LF
90 Degree	1	-	8	90 degree elbows x	10 LF	=	10 LF
Reducer	1	-	8	Reducers x	8 LF	=	8 LF
		Equivalent length of	**8**	**pipe based on C = 120**			**655 LF**

C. Static Head

Highest Point of Force Main 10.50 FT NAVD

Low Water Level In Wetwell -2.26 FT NAVD

Total Static Head 12.76 FT

D. Head in Receiving Force Main

Receiving force main pressure PEAK 41.9 FT of Head

MIN 20.8 FT of Head

E. System Head Curve

Pipe Classifiaction	Inside Diameter (in)	C Factor	Equiv. Length (ft)
Pump Discharge (HDPE)	7.55	120	48
Force Main (PVC)	7.94	120	655

SYSTEM CURVE DATA POINTS

Flow (GPM)	Force Main Velocity (FPS)	Friction Loss(ft)	Static Head(ft)	TDH (Peak POC Pressure)	TDH (Min POC Pressure)	
0	0.0	0.0	12.8	54.7	33.6	
150	1.0	0.5	12.8	55.1	34.0	
300	1.9	1.7	12.8	56.4	35.3	
450	2.9	3.6	12.8	58.3	37.2	
580	3.8	5.8	12.8	60.4	39.3	Max System Pressure
730	4.7	8.8	12.8	63.5	42.4	
790	5.1	10.2	12.8	64.9	43.8	Min System Pressure
1050	6.8	17.3	12.8	72.0	50.9	

F. Cycle Time Analysis

$$T = \frac{V_{op}}{Q - S} + \frac{V_{op}}{S}$$

Where T = Wetwell Cycle Time (min.)
RT = Pump Run Time (min.)
V_{op} = Volume of Operating Range (gal.)
Q = Pumping Rate (GPM)
S = Incoming Flow (GPM)

Assume : **8** ft diameter wetwell and **3** ft of operating range (H_1)

H1 = "Lead Pump On" elevation minus "Pump Off" elevation

2 number of pumps

V_{op} = 1129.5 gal. $V_{op} = Pi * r^2 * H_1$

DESIGN POINT

Average Influent Flow

S = 144.00 GPM (ADF) 207360 GPD

$T = V_{op}/(Q-S) + V_{op}/S$

T =		1129.51		+	1129.51	=		Q (Pump Rate)
	Q	-	144.00		144.00		**9.93 min.** ←	**685 GPM**

$RT = V_{op}/(Q - S)$

RT =		1129.51		=				
	Q	-	144.00				**2.09 min.** ←	**685 GPM**

Minimum Influent Flow

S = 96.48 GPM (Minimum Flow) 0.67 (min. factor) 138,931 GPD

T =		1129.51		+	1129.51	=		
	Q	-	96.48		96.48		**13.34 min.** ←	**790 GPM**
RT =		1129.51		=				
	Q	-	96.48				**1.63 min.** ←	**790 GPM**

Peak Hourly Influent Flow

S = 576 GPM (Peak Flow) 4.00 (peak factor) 829,440 GPD

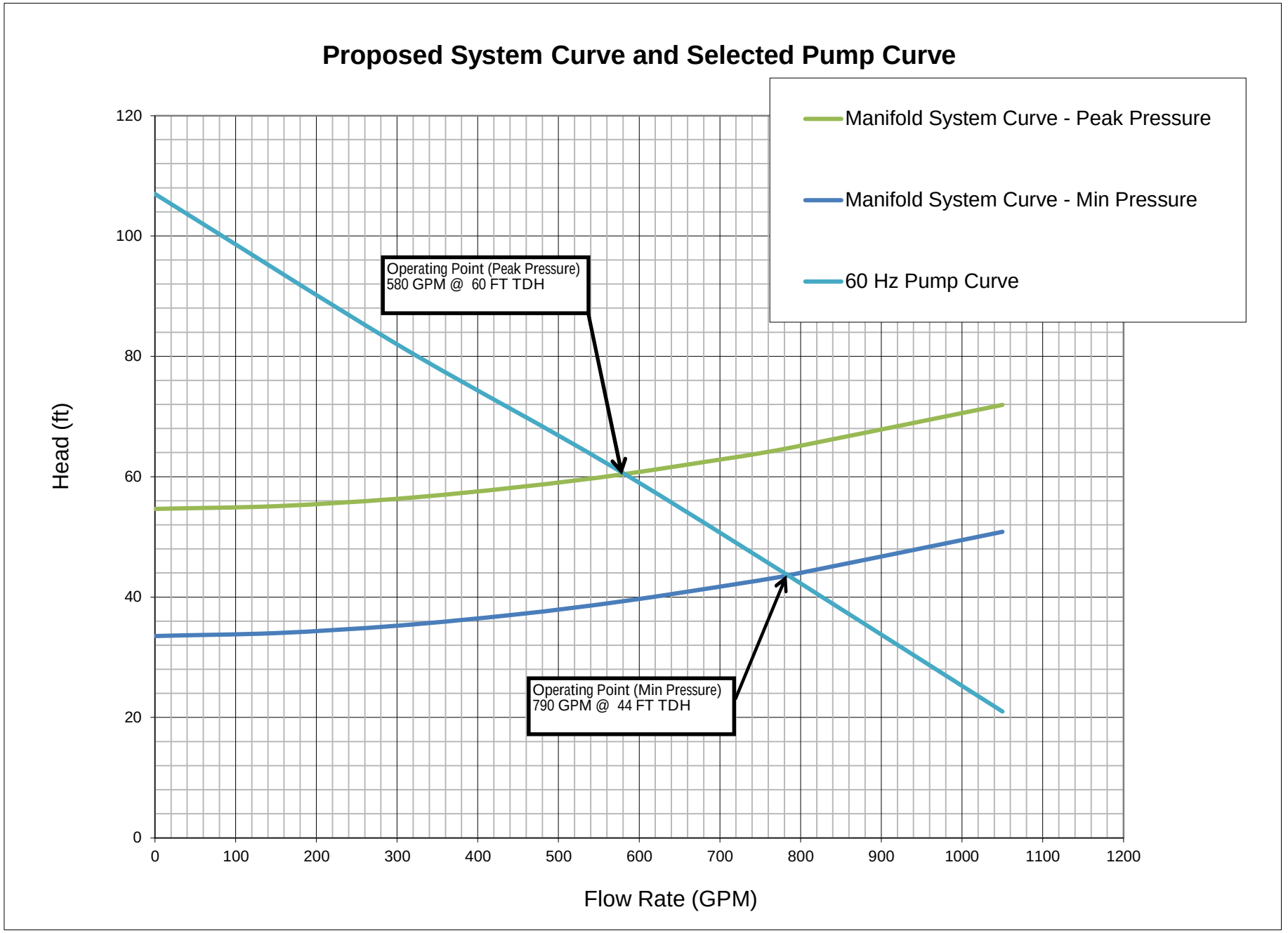
T =		1129.51		+	1129.51	=		
	Q	-	576.00		576.00		**284.34 min.** ←	**580 GPM**
RT =		1129.51		=				
	Q	-	576.00				**282.38 min.** ←	**580 GPM**

Minimum Influent Flow	Number of cycles per hour per pump	**2.25**	**cycles**	*Maximum 30 Cycles per Flygt Pump Manual*
	Filling Time	**11.71**	**minutes**	*Maximum 30 Minutes per RSWF 42.62*
Peak Hourly Influent Flow	Number of cycles per hour per pump	**0.11**	**cycles**	*Maximum 30 Cycles per Flygt Pump Manual*
	Filling Time	**1.96**	**minutes**	*Maximum 30 Minutes per RSWF 42.62*

G. Float Calculations

Float Elevations

Bottom of Wetwell	-5.00
Pump Off Elevation	-2.26
Lead On	0.74
Lag On	1.24
High Level Alarm	2.24
Invert Elevation	2.74


Proposed System Curve and Selected Pump Curve
Manifold System Curve - Peak Pressure
Manifold System Curve - Min Pressure
60 Hz Pump Curve
Operating Point (Peak Pressure)
580 GPM @ 60 FT TDH
Operating Point (Min Pressure)
790 GPM @ 44 FT TDH
Head (ft)
Flow Rate (GPM)
0
20
40
60
80
100
120
0
100
200
300
400
500
600
700
800
900
1000
1100
1200

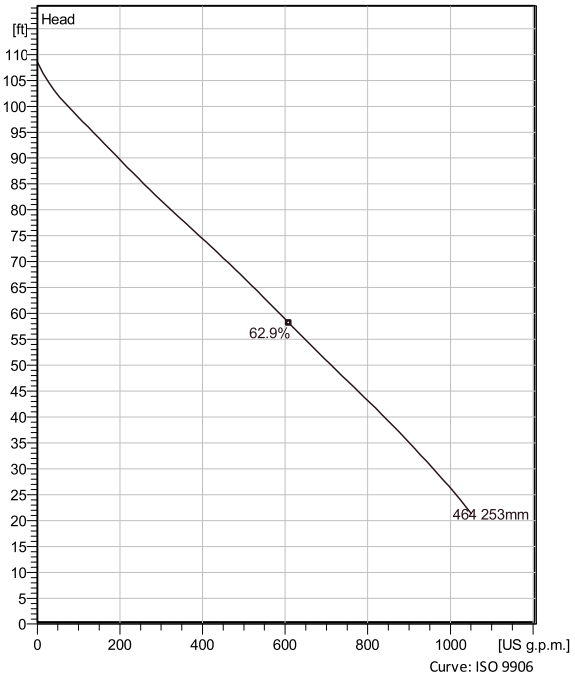
APPENDIX C:
Selected Pump Information

FP 3153 HT 3~ 464

Open screw type cutting impellers and single volute casing for liquids containing long fibres and large solids. F3153 and F3171 are new designs with high efficiency combined with excellent cutting performance.

Technical specification

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



Curve: ISO 9906

Configuration

Motor number
F3153.350 21-18-4AA-W 20hp

Installation type
P - Semi permanent, Wet

Impeller diameter
253 mm

Discharge diameter
4 inch

Pump information

Impeller diameter
253 mm

Discharge diameter
4 inch

Inlet diameter
150 mm

Maximum operating speed
1755 rpm

Number of blades
2

Max. fluid temperature
40 °C

Configuration

Material

Impeller
Hard-Iron ™

Project		**Created by**		
Block		**Created on**	2/1/2023	**Last update** 2/1/2023

FP 3153 HT 3~ 464

Technical specification

Motor - General

Motor number F3153.350 21-18-4AA-W 20hp	**Phases** 3~	**Rated speed** 1755 rpm	**Rated power** 20 hp
ATEX approved No	**Number of poles** 4	**Rated current** 59 A	**Stator variant** 4
Frequency 60 Hz	**Rated voltage** 200 V	**Insulation class** H	**Type of Duty** S1
Version code 350			

Motor - Technical

Power factor - 1/1 Load 0.84	**Motor efficiency - 1/1 Load** 87.5 %	**Total moment of inertia** 2.27 lb ft²	**Starts per hour max.** 30
Power factor - 3/4 Load 0.79	**Motor efficiency - 3/4 Load** 89.0 %	**Starting current, direct starting** 330 A	
Power factor - 1/2 Load 0.68	**Motor efficiency - 1/2 Load** 89.5 %	**Starting current, star-delta** 110 A	

Project		**Created by**		
Block		**Created on**	2/1/2023	**Last update** 2/1/2023

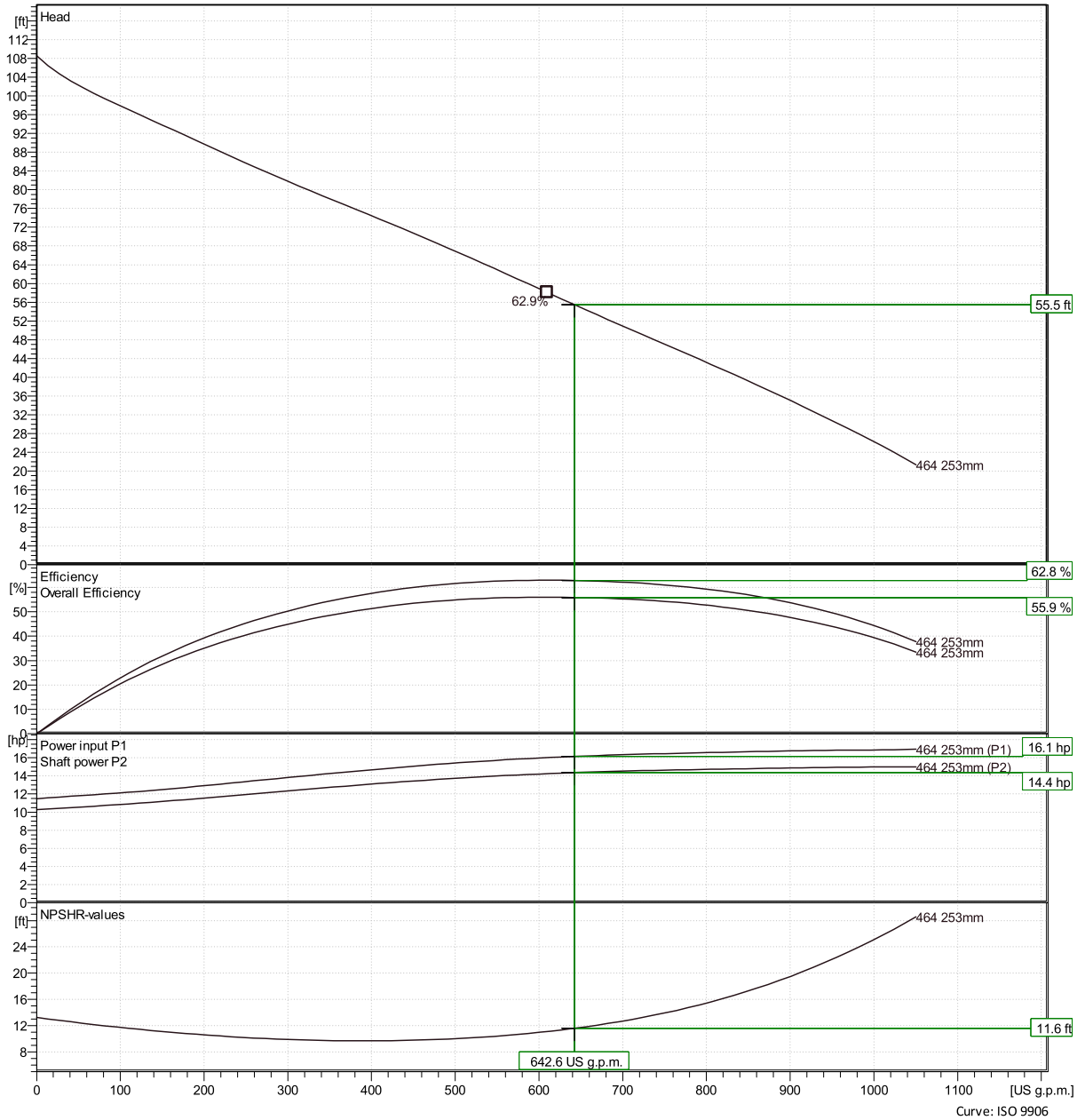
FP 3153 HT 3~ 464

Performance curve

Duty point

Flow	Head
643 US g.p.m.	55.5 ft

Curves according to: Water, pure Water, pure [100%],39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s



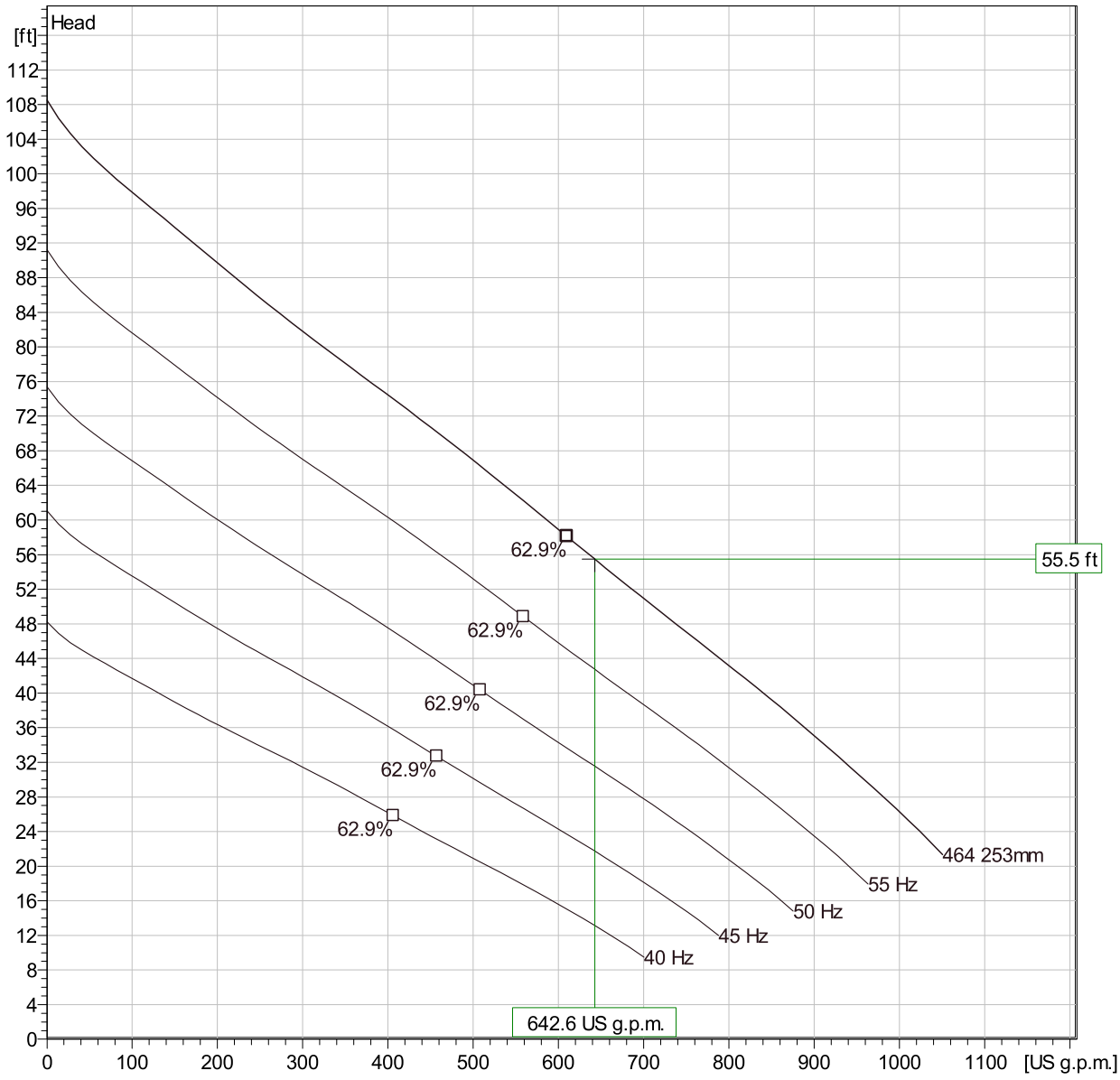
Curve: ISO 9906

Created on	2/1/2023	Last update	2/1/2023

FP 3153 HT 3~ 464

Duty Analysis

Curves according to: Water, pure [100%] ; 39.2°F; 62.42lb/ft³; 1.6891E-5ft²/s



Operating characteristics

Pumps / Systems	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Spec. Energy	NPSHre
	US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	643	55.5	14.4	643	55.5	14.4	62.8 %	312	11.6

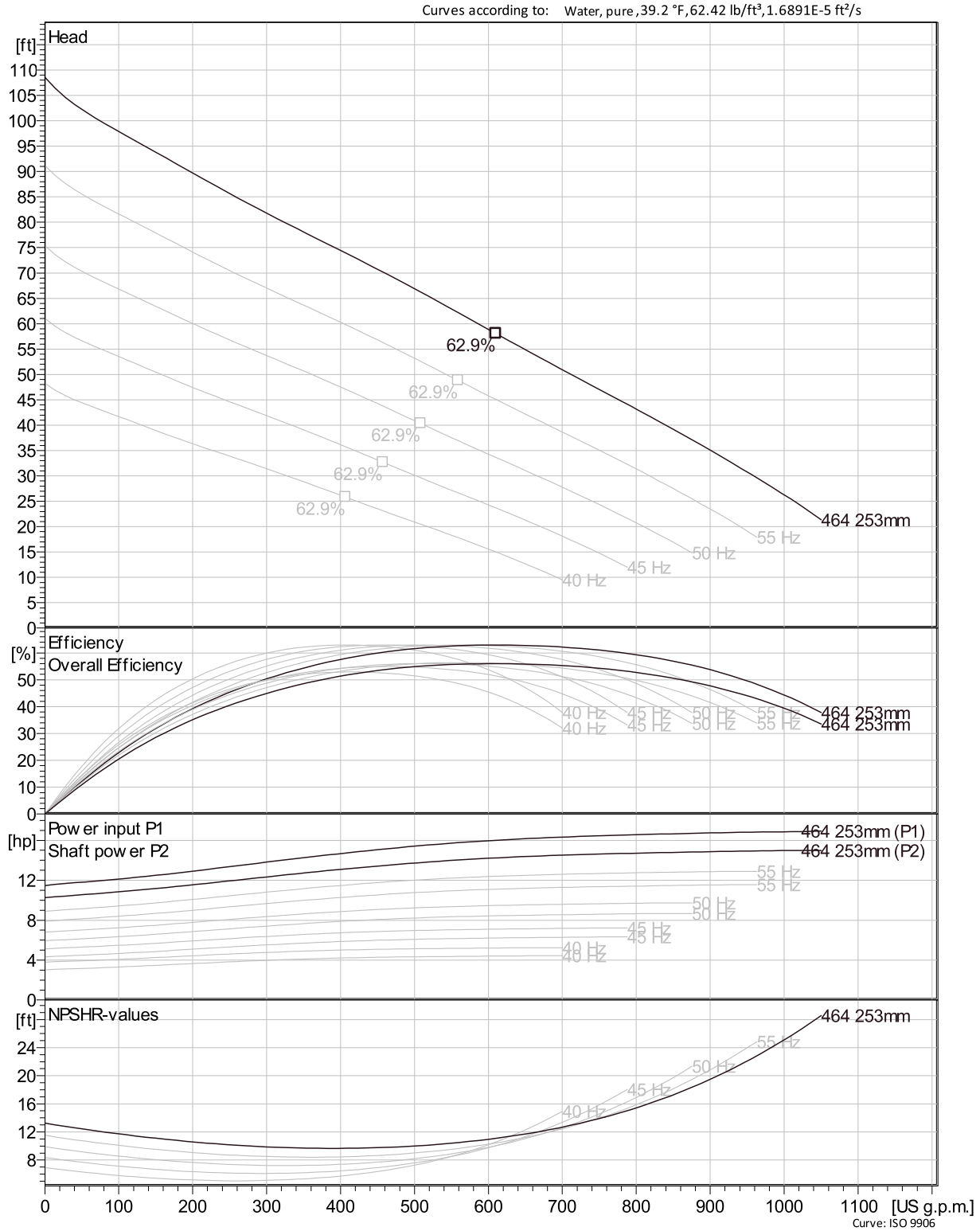
Project		**Created by**			
Block		**Created on**	2/1/2023	**Last update**	2/1/2023

FP 3153 HT 3~ 464

VFD Curve

FLYGT
a xylem brand

Curves according to: Water, pure ,39.2 °F,62.42 lb/ft³,1.6891E-5 ft²/s

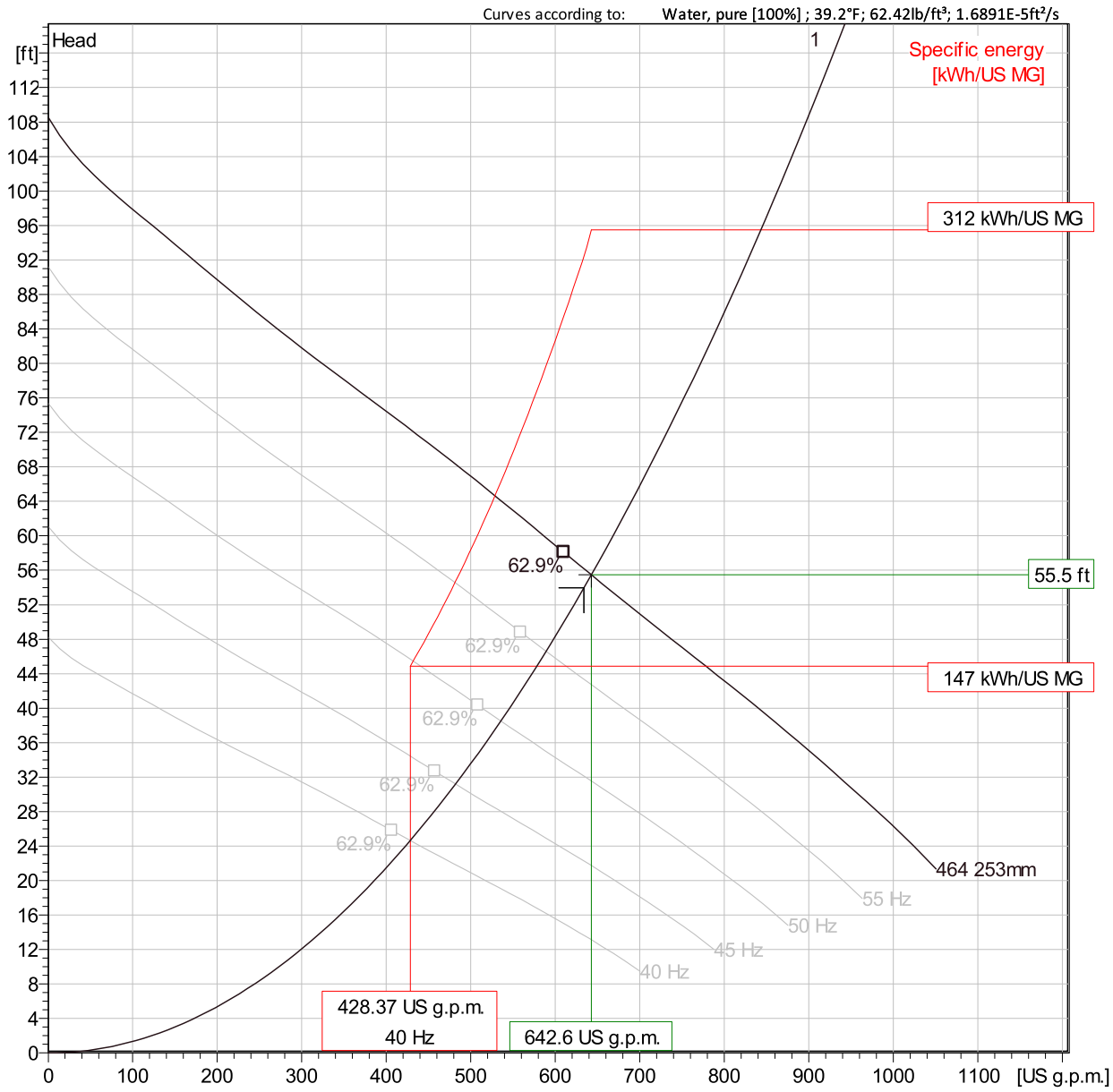


Curve: ISO 9906

Project		**Created by**			
Block		**Created on**	2/1/2023	**Last update**	2/1/2023

FP 3153 HT 3~ 464

VFD Analysis



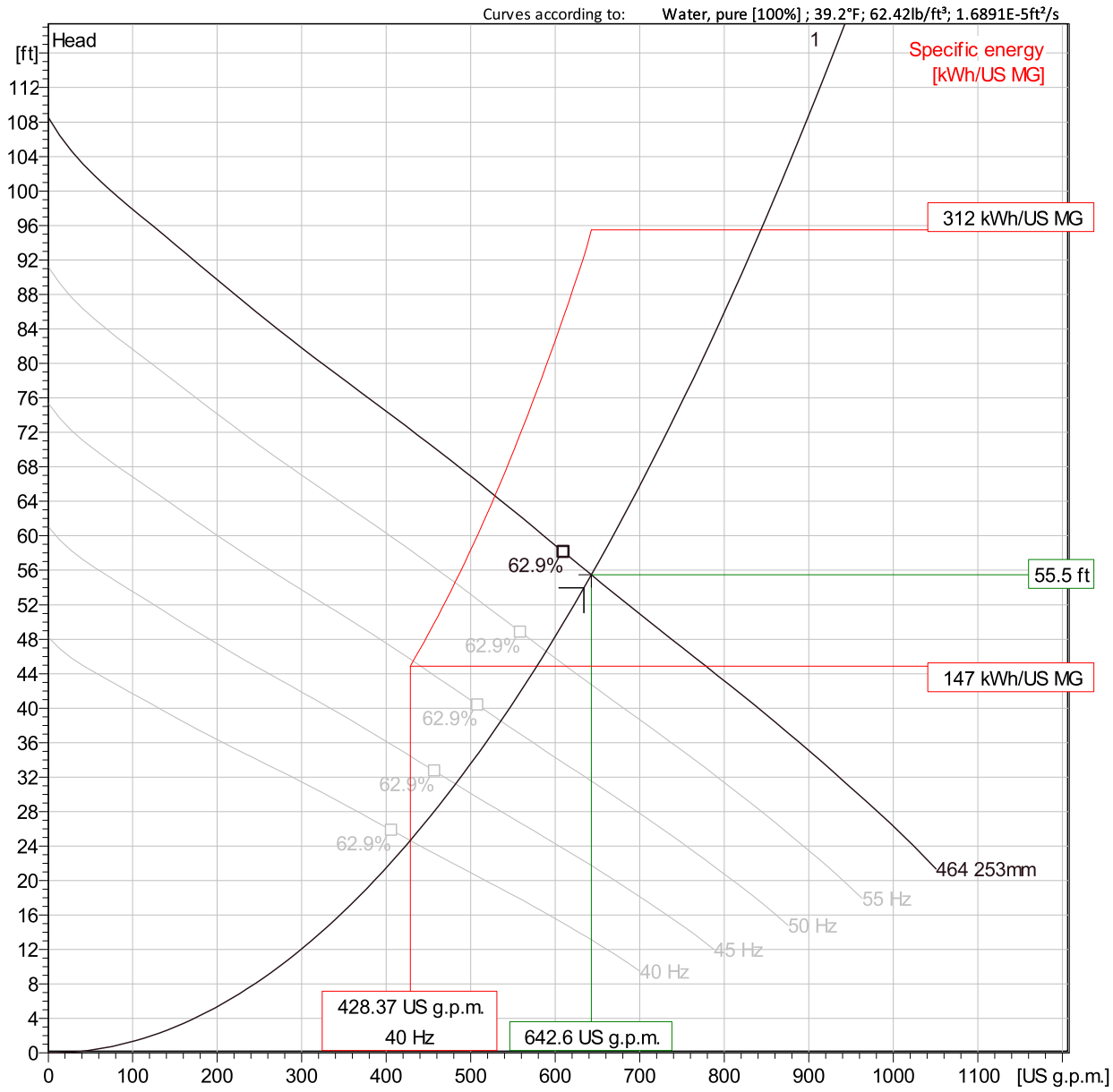
Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	60 Hz	643	55.5	14.4	643	55.5	14.4	62.8 %	312	11.6
1	55 Hz	589	46.6	11.1	589	46.6	11.1	62.8 %	261	10.1
1	50 Hz	535	38.5	8.31	535	38.5	8.31	62.8 %	217	8.66
1	45 Hz	482	31.2	6.06	482	31.2	6.06	62.8 %	179	7.31

Project		**Created by**			
Block		**Created on**	2/1/2023	**Last update**	2/1/2023

FP 3153 HT 3~ 464

VFD Analysis



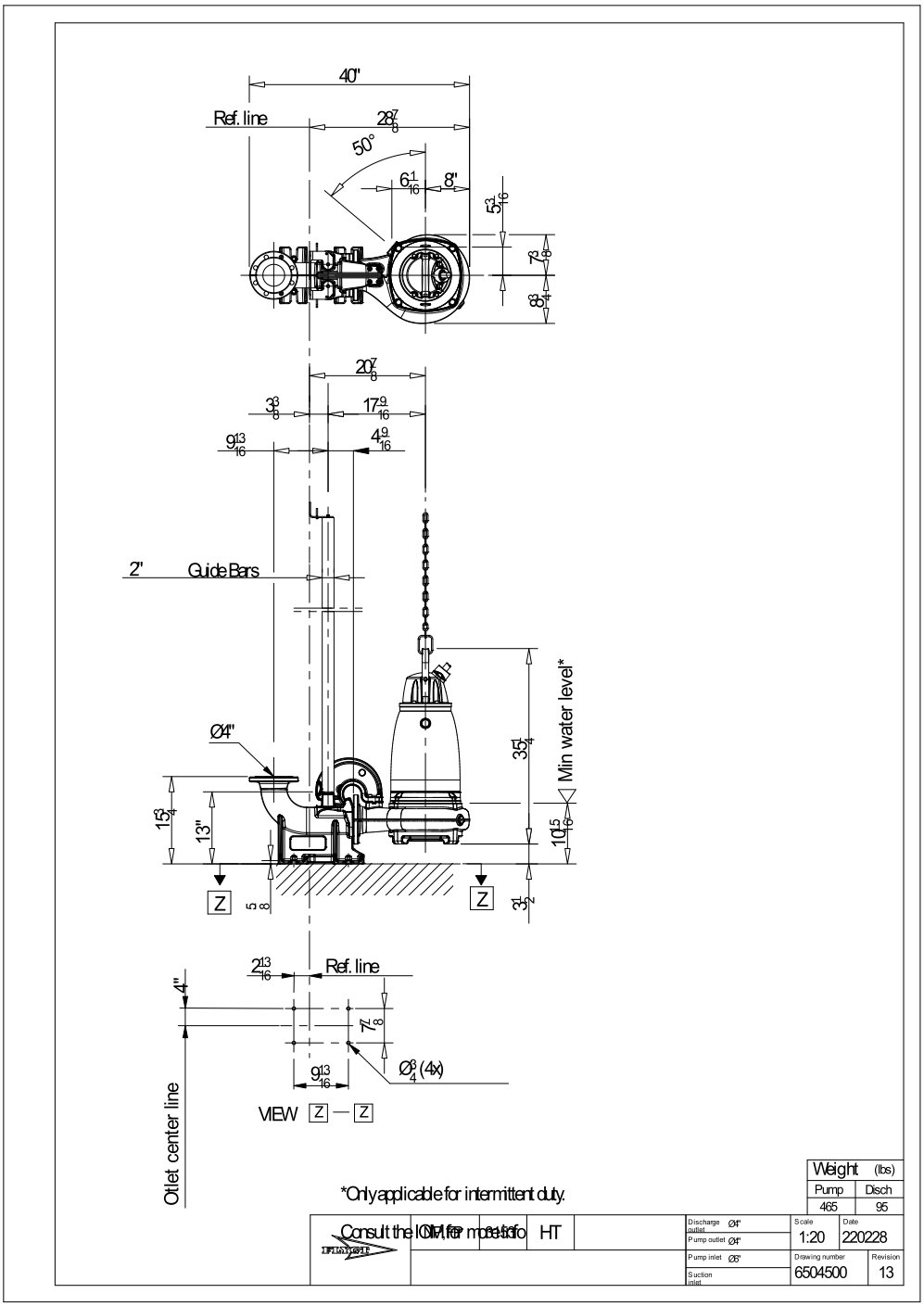
Operating Characteristics

Pumps / Systems	Frequency	Flow	Head	Shaft power	Flow	Head	Shaft power	Hydr.eff.	Specific energy	NPSHre
		US g.p.m.	ft	hp	US g.p.m.	ft	hp		kWh/US MG	ft
1	40 Hz	428	24.7	4.25	428	24.7	4.25	62.8 %	147	6.06

Project		**Created by**			
Block		**Created on**	2/1/2023	**Last update**	2/1/2023

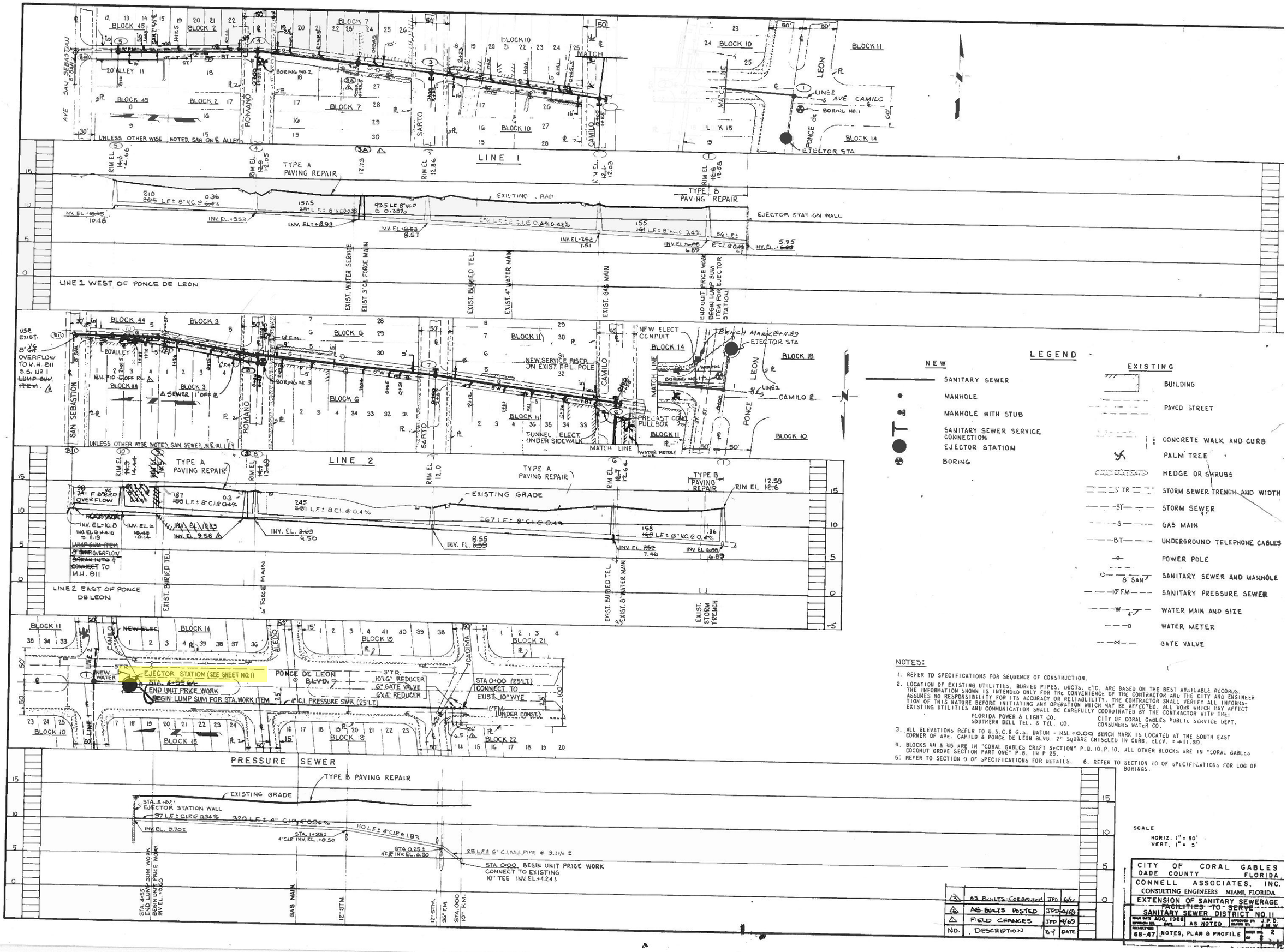
FP 3153 HT 3~ 464

Dimensional drawing



Project		**Created by**			
Block		**Created on**	2/1/2023	**Last update**	2/1/2023

APPENDIX D:
Pump Station City No. 6 As-Builts


LINE 1
LINE 1 WEST OF PONCE DE LEON
LINE 2
LINE 2 EAST OF PONCE DE LEON
PRESSURE SEWER
UNLESS OTHER WISE NOTED, SAN SEWER IN ℄ ALLEY
TYPE A PAVING REPAIR
TYPE B PAVING REPAIR
EXISTING GRADE
EXISTING PAD
EJECTOR STATION WALL
EJECTOR STATION (SEE SHEET NO 11)
PONCE DE LEON BLVD.
BLOCK 45
BLOCK 44
BLOCK 7
BLOCK 10
BLOCK 11
BLOCK 14
BLOCK 15
BLOCK 3
BLOCK 6
BLOCK 19
BLOCK 21
BLOCK 18
BLOCK 22
20' ALLEY 11
20' ALLEY 10
SAN SEBASTIAN
ROMANO
SARTO
CAMILO
LEON
PONCE de
ALEDO
VALENCIA
MATCH LINE
BORING NO.1
BORING NO.2
EJECTOR STA
NEW ELECT CONDUIT
NEW SERVICE RISER ON EXIST. F.P.L. POLE
PRECAST CONC PULLBOX
TUNNEL ELECT UNDER SIDEWALK
WATER METER
BENCH MARK @ +11.89
EJECTOR STATION WALL
EXIST. WATER SERVICE
EXIST 3" CI. FORCE MAIN
EXIST. BURIED TEL.
EXIST. 4" WATER MAIN
EXIST. GAS MAIN
EXIST. 8" WATER MAIN
EXIST. STORM TRENCH
END UNIT PRICE WORK BEGIN LUMP SUM ITEM FOR EJECTOR STATION
USE EXIST. 8" ℄ OVERFLOW TO M.H. 811 S.S. NO 1 LUMP SUM ITEM.
8" ℄ OVERFLOW TO M.H. 811
LUMP SUM ITEM
210 LF ± 8" VC @ 0.36
157.5 LF ± 8" VC @ 0.38
93.5 LF 8" VCP @ 0.387
155 LF ± 8" VC @ 0.42%
50' LF ±
187 LF ± 8" C.I. @ 0.4%
245 281 LF ± 8" C.I. @ 0.4%
CONNECT TO M.H. 811
STA. 0+00 (25' LT) CONNECT TO EXIST. 10" WYE
10" F.M. (UNDER CONST.)
3" T.R. 10"x6" REDUCER 6" GATE VALVE 6"x4" REDUCER
4" C.I. PRESSURE SWR. (25' LT)
STA. 5+02 EJECTOR STATION WALL
37 LF ± C.I.P. @ 0.34%
320 LF ± 4" C.I.P. @ 0.04%
110 LF ± 4" C.I.P. @ 1.8%
STA. 1+35 ± 4" C.I.P. INV. EL. +8.50
STA. 0+25 ± 4" C.I.P. INV. EL. 8.50
25 LF ± 6" C.I.M.J. PIPE @ 9.1% ±
STA. 0+00 BEGIN UNIT PRICE WORK CONNECT TO EXISTING 10" TEE INV. EL. +4.24 ±
STA. 4+55 END LUMP SUM WORK BEGIN UNIT PRICE WORK INV. EL. +9.60
GAS MAIN
12" STM.
36" F.M.
10" F.M.
NOTES:
1. REFER TO SPECIFICATIONS FOR SEQUENCE OF CONSTRUCTION.
2. LOCATION OF EXISTING UTILITIES, BURIED PIPES, DUCTS, ETC. ARE BASED ON THE BEST AVAILABLE RECORDS. THE INFORMATION SHOWN IS INTENDED ONLY FOR THE CONVENIENCE OF THE CONTRACTOR AND THE CITY AND ENGINEER ASSUMES NO RESPONSIBILITY FOR ITS ACCURACY OR RELIABILITY. THE CONTRACTOR SHALL VERIFY ALL INFORMATION OF THIS NATURE BEFORE INITIATING ANY OPERATION WHICH MAY BE AFFECTED. ALL WORK WHICH MAY AFFECT EXISTING UTILITIES AND COMMUNICATION SHALL BE CAREFULLY COORDINATED BY THE CONTRACTOR WITH THE:
FLORIDA POWER & LIGHT CO.
SOUTHERN BELL TEL. & TEL. CO.
CITY OF CORAL GABLES PUBLIC SERVICE DEPT.
CONSUMERS WATER CO.
3. ALL ELEVATIONS REFER TO U.S.C.& G.S. DATUM - MSL = 0.00 BENCH MARK IS LOCATED AT THE SOUTH EAST CORNER OF AVE. CAMILO & PONCE DE LEON BLVD. 2" SQUARE CHISELED IN CURB. ELEV. = +11.89.
4. BLOCKS 44 & 45 ARE IN "CORAL GABLES CRAFT SECTION" P.B. 10, P. 10. ALL OTHER BLOCKS ARE IN "CORAL GABLES COCONUT GROVE SECTION PART ONE" P.B. 14 P. 25.
5. REFER TO SECTION 9 OF SPECIFICATIONS FOR DETAILS.
6. REFER TO SECTION 10 OF SPECIFICATIONS FOR LOG OF BORINGS.
LEGEND
NEW
SANITARY SEWER
MANHOLE
MANHOLE WITH STUB
SANITARY SEWER SERVICE CONNECTION
EJECTOR STATION
BORING
EXISTING
BUILDING
PAVED STREET
CONCRETE WALK AND CURB
PALM TREE
HEDGE OR SHRUBS
STORM SEWER TRENCH AND WIDTH
STORM SEWER
GAS MAIN
UNDERGROUND TELEPHONE CABLES
POWER POLE
SANITARY SEWER AND MANHOLE
SANITARY PRESSURE SEWER
WATER MAIN AND SIZE
WATER METER
GATE VALVE
SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'
3 AS BUILTS-CORRECTED JPD 6/69
2 AS-BUILTS POSTED JPD 4/69
1 FIELD CHANGES JPD 4/69
NO. DESCRIPTION BY DATE
CITY OF CORAL GABLES
DADE COUNTY FLORIDA
CONNELL ASSOCIATES, INC.
CONSULTING ENGINEERS MIAMI, FLORIDA
EXTENSION OF SANITARY SEWERAGE FACILITIES TO SERVE SANITARY SEWER DISTRICT NO. 11
ISSUE DATE AUG. 1968
REVISION DATE AS NOTED
APPROVED BY J.P.D.
DRAWN BY M.W.
PROJECT NO. 68-47
NOTES, PLAN & PROFILE
SHEET NO. 2