Exhibit C

MIAMIBEACH

Lincoln Road Storm Water Treatment System Location Concepts

West Avenue Phase II Improvements

City of Miami Beach, Florida

RIC-MAN CONST. FL, INC. DEERFIELD BEACH, FLORIDA

CES CONSULTANTS

Agenda

Storm Water Drainage Project Background & History

Storm Water Drainage Project Background & History

March 2017 — City Commission approves Design Build contract with RMCF/CES based on a **5-year Storm event.**

Dec. 2017 — **City "Pauses" project at 60% design.**

April 2018 — **City partners with the Urban Land Institute (ULI).**

May 2018 — **West Ave selected to participate in the Resiliency Accelerator.**

June-Sept. 2018 — RMCF/CES **focusing on feedback from the community, working with ULI.**

Oct. 2018 — Recommendations presented to City Commission including:
1. **10-year storm event**
2. **Provide Auxiliary Generators**

Dec. 2018 — **Commission approves recommended enhancements.**

Existing Flooding Issues

Rain Flooding

May 2019	**Negative feedback received from Lincoln Road residents. City requests to examine alternate locations for the above ground Storm Water Treatment System equipment.**
June 2019	RMCF/CES proposed **Option 1 (Lincoln Ct and Bay Rd)**
Aug.-Oct. 2019	Median design of **Option 1 reached 90% completion.**
November 2019	RMCF/CES provides formal presentation of **ten (10) alternate locations, recommending Option 1 (Lincoln Ct and Bay Rd)** as the favored site.
February 2020	RMCF/CES provide a complete history of the development of alternate sites. The concept of **weekly meetings with residents** ensued to answer questions on **Screening Design and Park-End development** for the recommended location – Alternate 1 (Lincoln Ct and Bay Rd).
June 2020	**City requests a Limited Feasibility Study.**
July 2020	**RMCF/CES complete the Limited Feasibility Study with 11 Options.**
Today	

King Tide Flooding

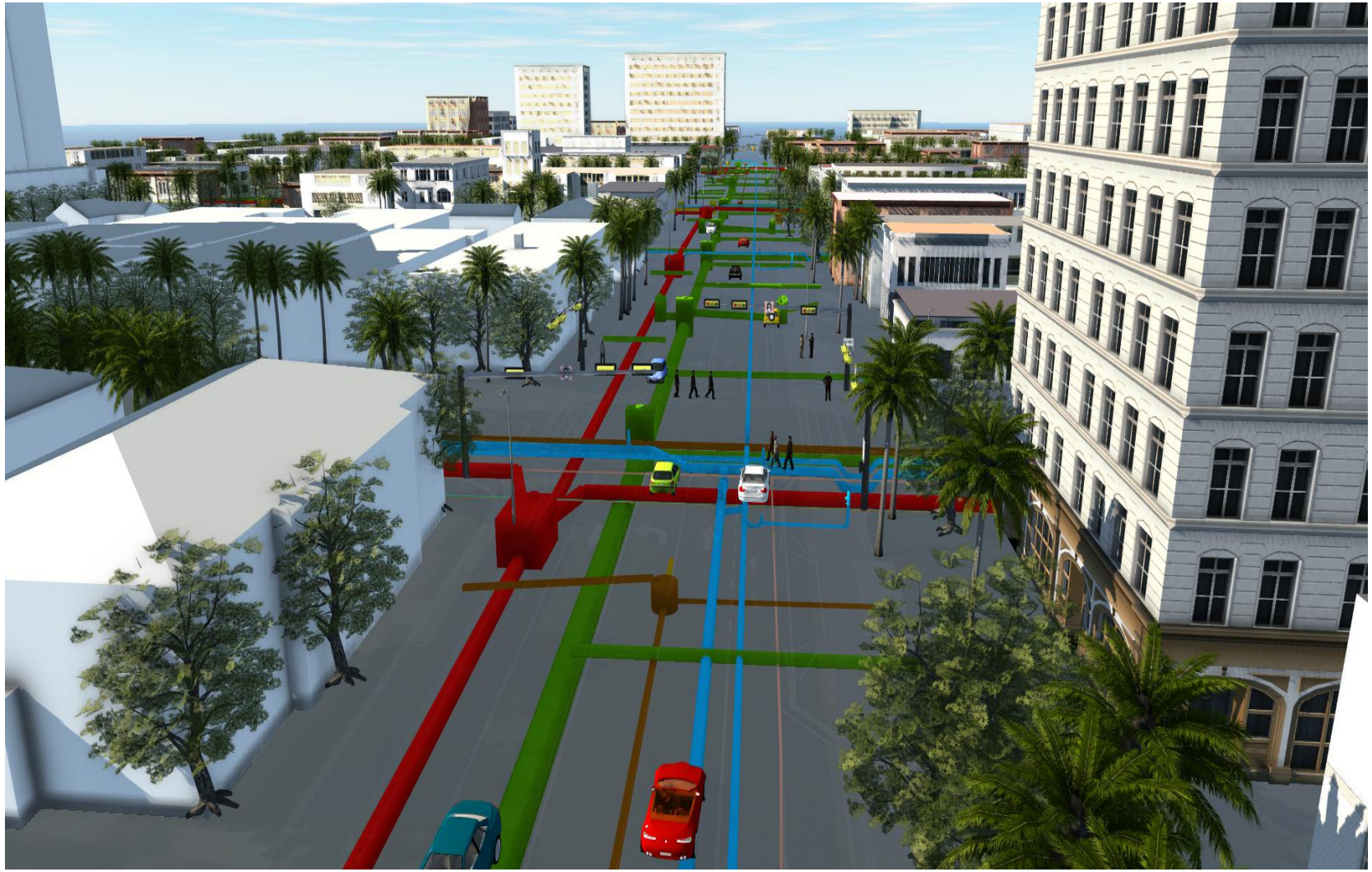
Rising Sea Levels

Components of a Storm Water Treatment System

Below Ground Components

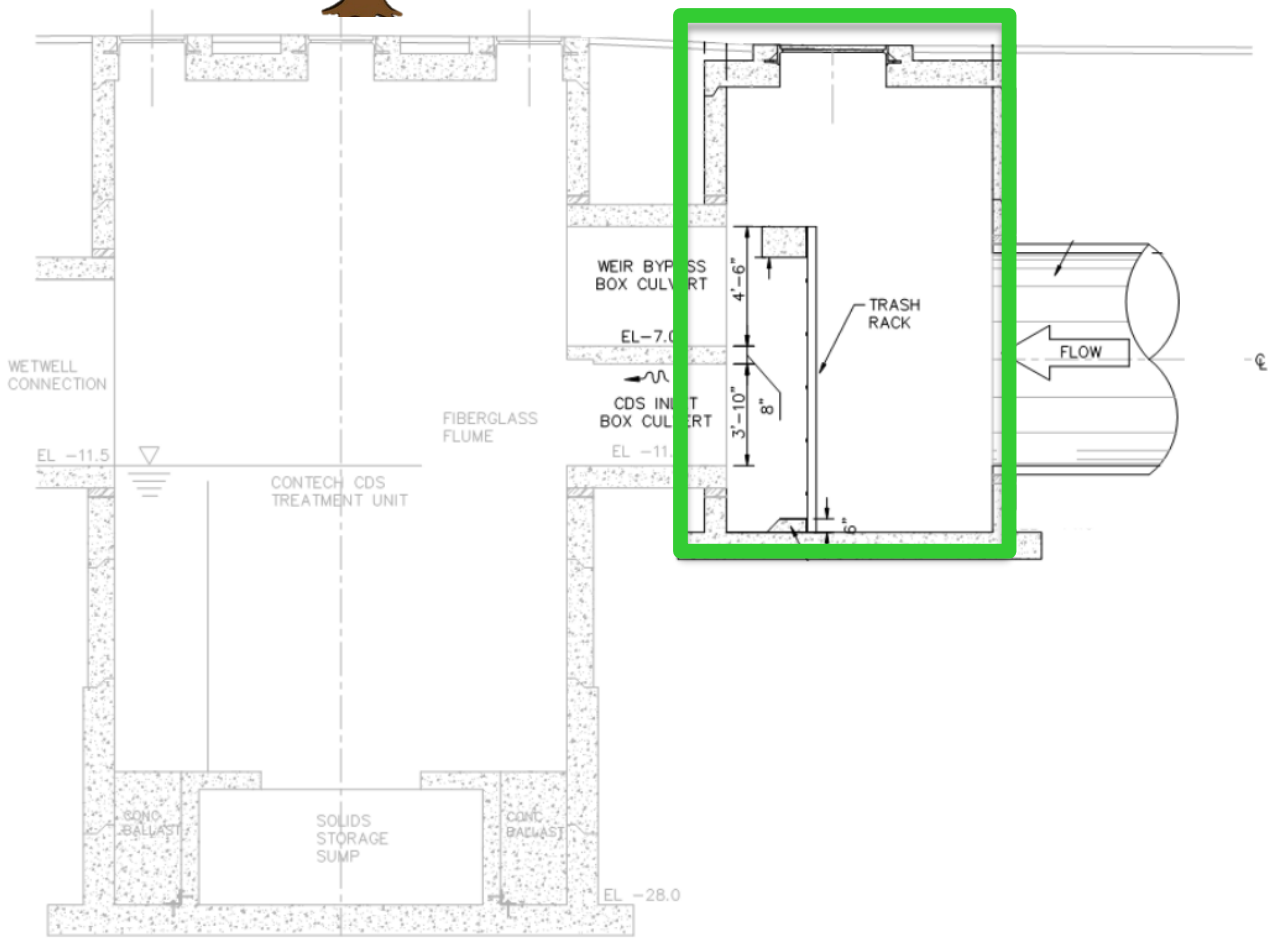
RMCF Storm Water Station PS052, Miami Beach, FL

Inflow Drainage Piping



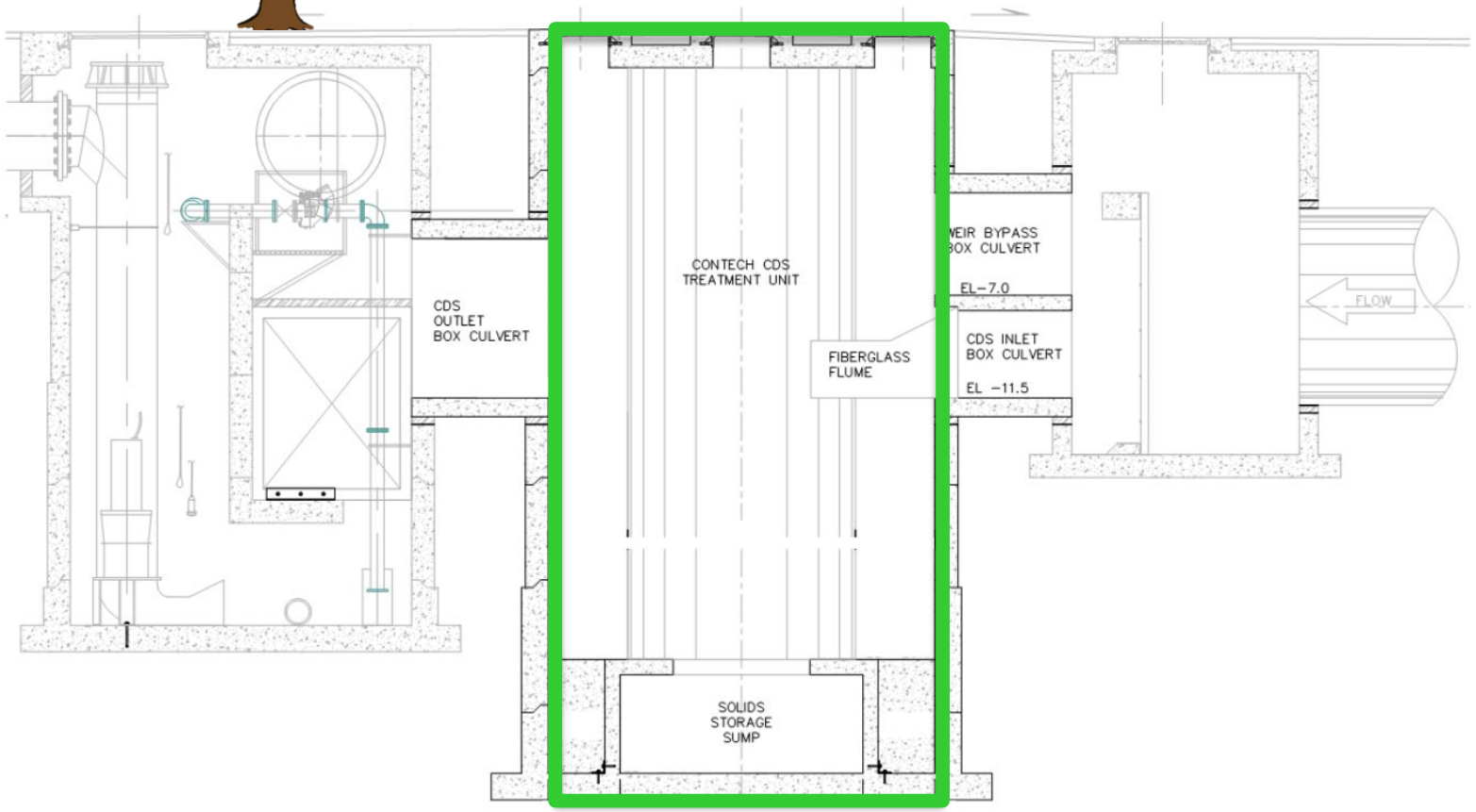
The **inflow drainage piping** conveys the amount of Storm Water generated in a theoretical **10-year storm event.**

Below Ground: Trash Rack



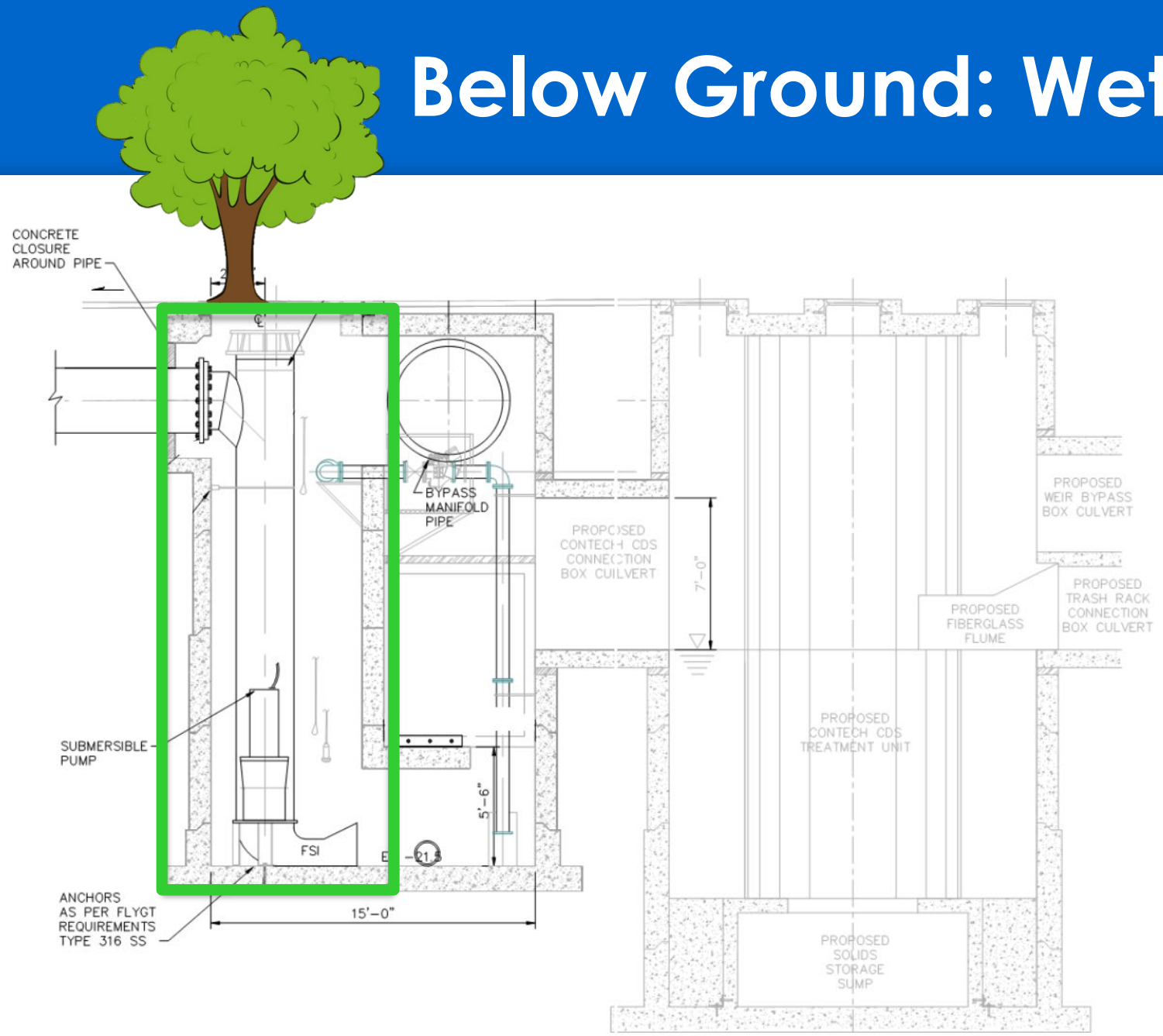
The **trash rack** is used to help maintain a **clean discharge into Biscayne Bay.**

Below Ground: Filtration System



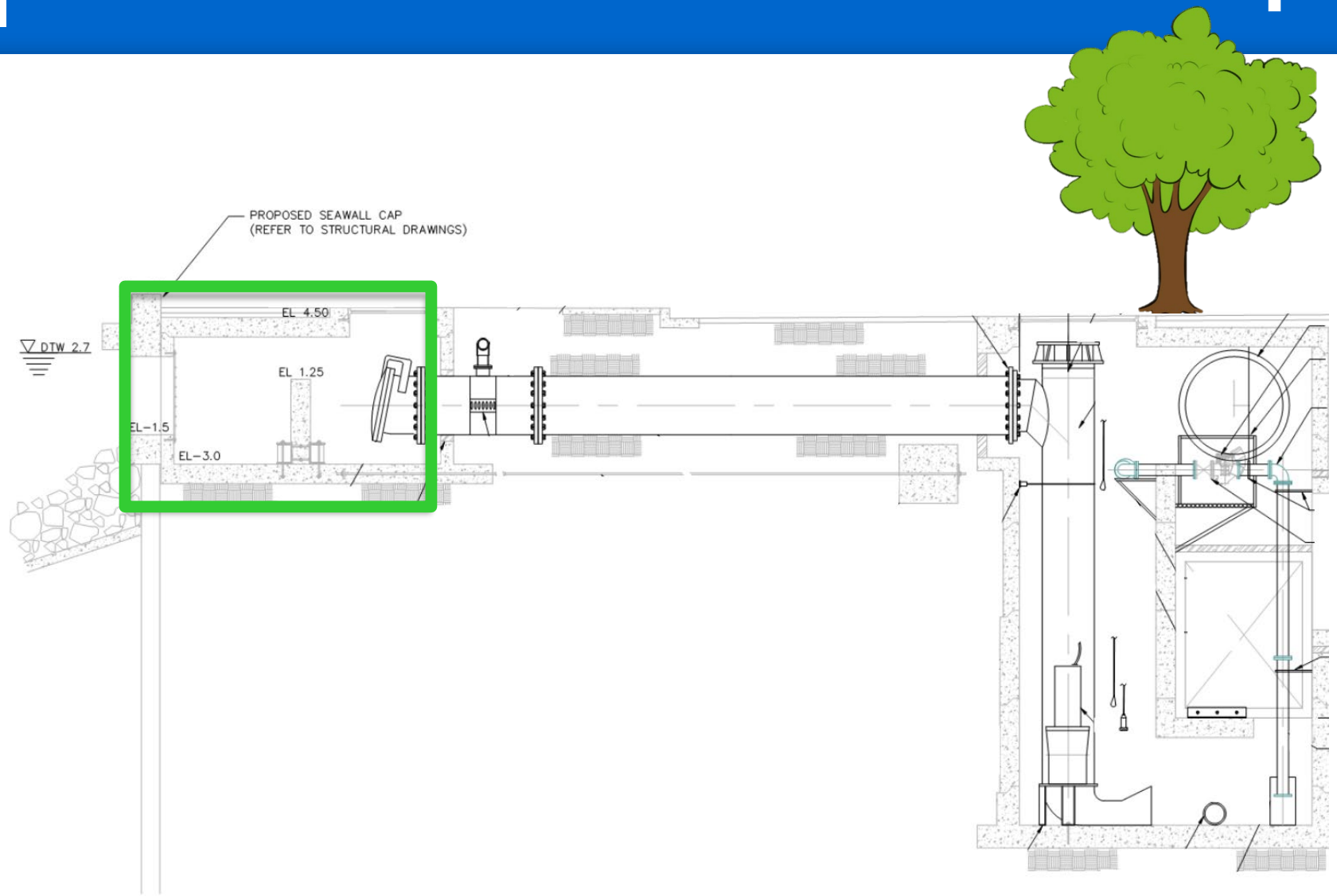
The **filtration system** helps maintain a **clean discharge into Biscayne Bay.**

Below Ground: Wet Well/Pumps



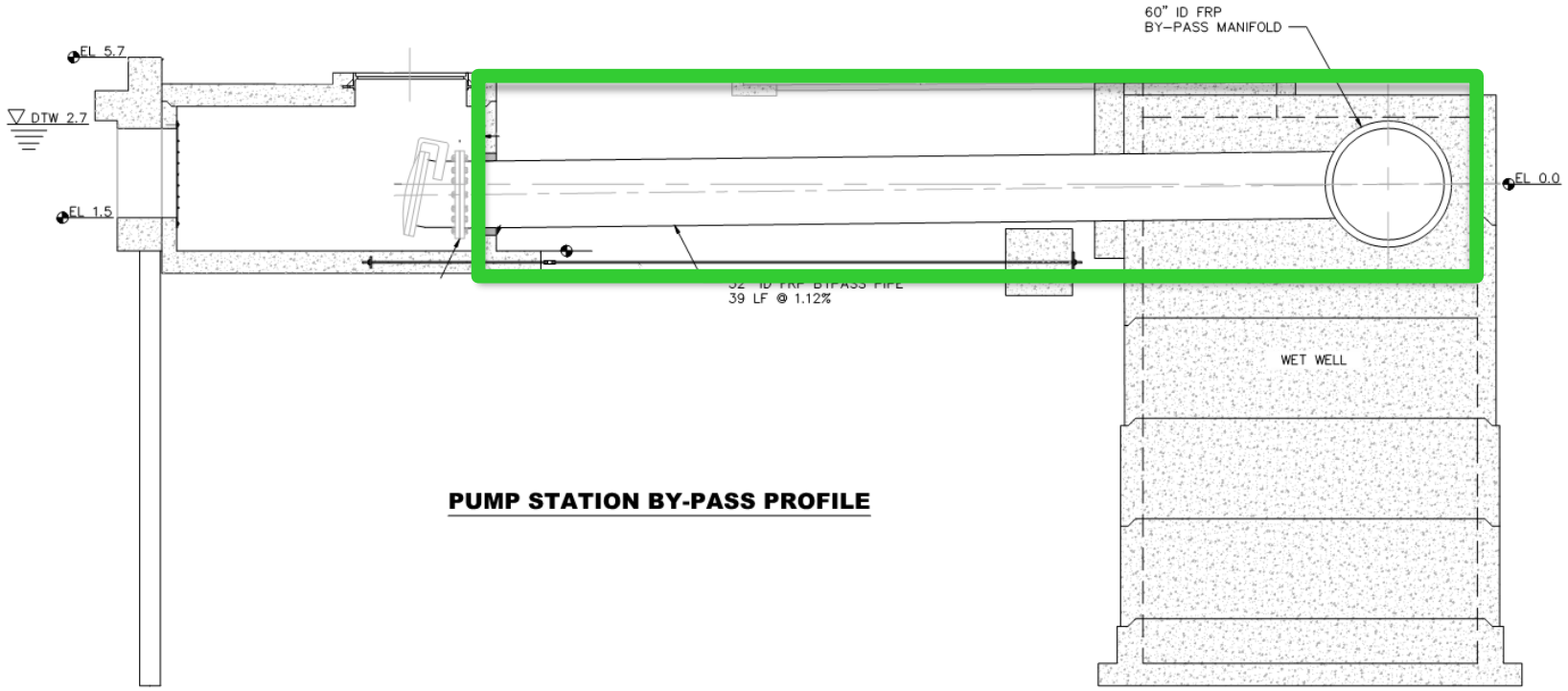
The **wet well** houses the **submersible pumps.**

Below Ground: Dissipator



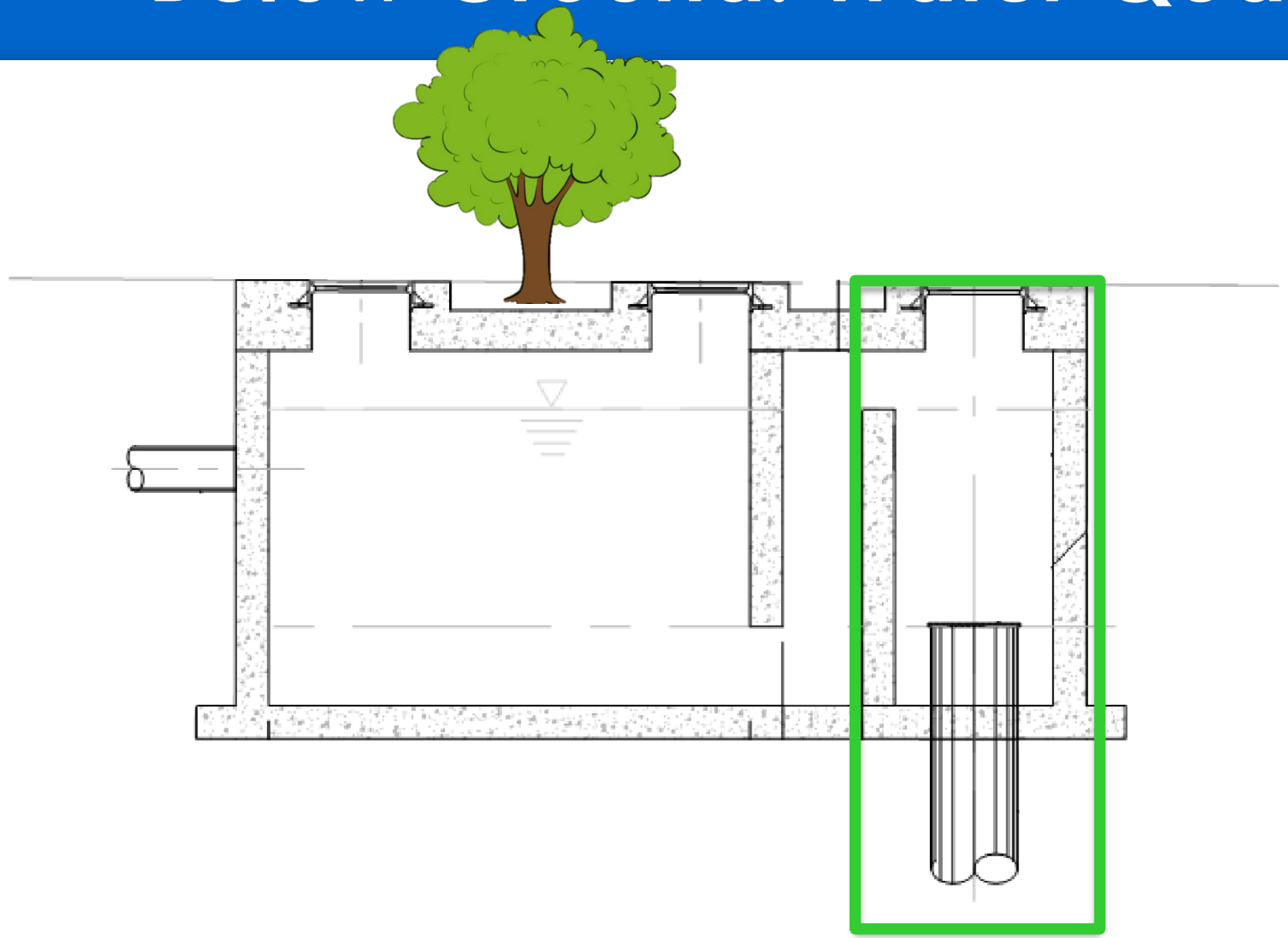
The **dissipator reduces the velocity** of the pumped Storm Water into Biscayne Bay, a **necessary environmental assurance.**

Below Ground: Emergency Bypass



The **emergency bypass system** allows the station to discharge Storm Water without the need for pumps.

Below Ground: Water Quality Wells



Water quality wells help **maintain a clean discharge** into Biscayne Bay.

Above Ground Components

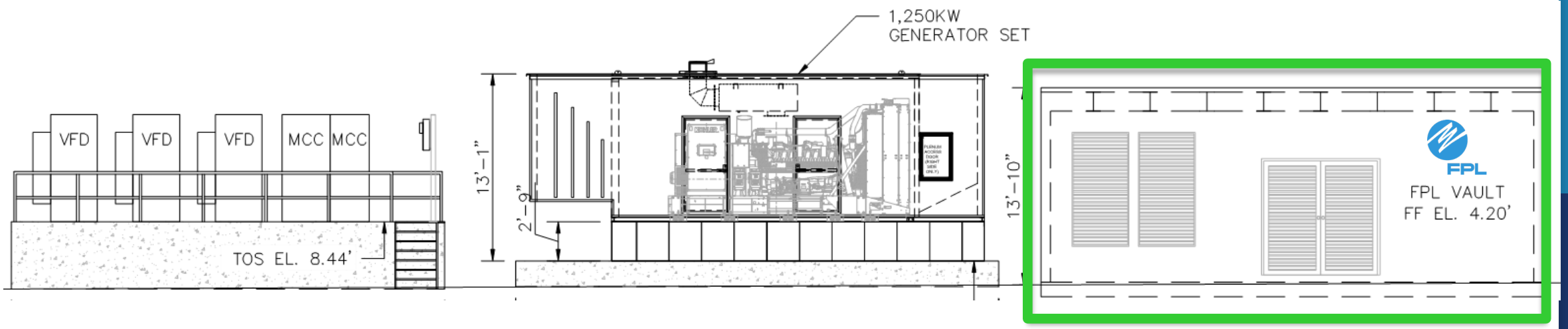
Above Ground: Control Panel Platform

The **control panel platform** is key to **proper operation of the Storm Water treatment system.**

Above Ground: Emergency Generator

The **emergency generator** will power the entire Storm Water treatment system if there is a loss of power.

Above Ground: FPL Electrical Vault



The **FPL electrical vault** provides **reliable power** to an important City asset.

Summary of Options

Summary of Options

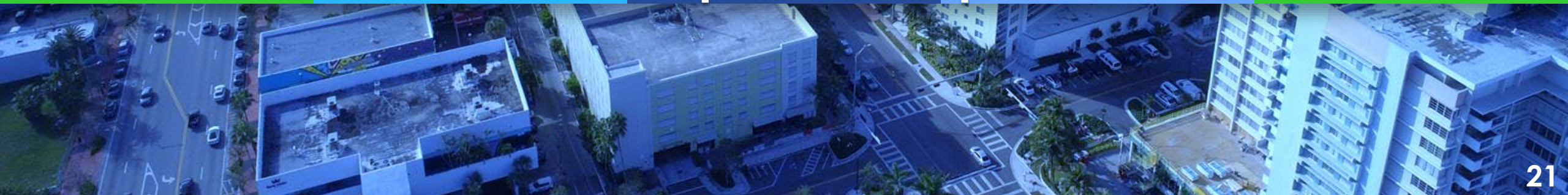
Option	Location	Underground Component Location	Generator Location	FPL Vault Location	Control Pane(s)I Location	10-Year Storm Piping	Emergency Gravity Bypass	Cost Impact	Δ To Option 1	Construction Time Impact (Days)	Recommendation
1	Lincoln Court & Bay Road; SWTS at Lincoln Road	Lincoln Rd	Lincoln Ct and Bay Rd	Lincoln Ct and Bay Rd	Lincoln Ct and Bay Rd	✓	✓	$1,805,000	$0	150	Base
2	Control Panels at Lincoln Road; All else at 1671	Lincoln Rd	1671 West Ave	1671 West Ave	Lincoln Ct and Bay Rd	✓	✓	$2,620,000	$815,000	150	Highly Preferred
3	SWTS and all EQ to 1671 – Discharge at Lincoln Road	1671 West Ave	1671 West Ave	1671 West Ave	1671 West Ave	✓	X	$4,296,000	$2,491,000	360	Preferred
3A	SWTS and EQ to 1671; Discharge at 17th	1671 West Ave	1671 West Ave	1671 West Ave	1671 West Ave	✓	X	$2,875,000	$1,070,000	325	Preferred
4	5-year Storm / 10-year Piping	Lincoln Rd	Lincoln Rd End	Lincoln Rd End	Lincoln Rd End	✓	✓	($2,632,876)	($4,437,876)	90	Not Recommended
4A	5-year Storm / 10-year Piping & Structures	Lincoln Rd	Lincoln Ct and Bay RD	Lincoln Ct and Bay Rd	Lincoln Ct and Bay Rd	✓	✓	$2,028,900	$223,900	180	Not Recommended
5	2 SWTS @ Lincoln Road & Bay Road	Lincoln Ct and Bay Rd	Lincoln Ct and Bay RD	Lincoln Ct and Bay Rd	Lincoln Ct and Bay Rd	✓	✓	$2,129,076	$324,076	360	Not Recommended
6	SWTS at Lincoln; All EQ at 1671	Lincoln Rd	1671 West Ave	1671 West Ave	1671 West Ave	✓	✓	$1,857,000	$52,000	150	Preferred
7	Upgrade 6th, 10th, 14th St SWTS; Downgrade Lincoln SWTS	6th,10th,14th, Lincoln	6th,10th,14th,Lincoln	6th,10th,14th, Lincoln	6th,10th,14th, Lincoln	✓	✓	($87,000)	($1,892,000)	480	Not Recommended
8	Eliminate Gen Set; SWTS and EQ at Lincoln	Lincoln Rd	N/A	Lincoln Ct and Bay Rd	Lincoln Ct and Bay Rd	✓	✓	$468,537	($1,336,463)	150	Not Recommended
9	SWTS at Lincoln Rd; All EQ at 1625	Lincoln Rd	1625 West Ave	1625 West Ave	1625 West Ave	✓	✓	$1,810,000	$5,000	150	Preferred
10	Above Ground EQ @ Gaythering Hotel	Lincoln Rd	Gaythering Hotel	Gaythering Hotel	Gaythering Hotel	✓	✓	$3,200,000	$1,395,000	Min. 420	Not Recommended

Engineering & Construction Perspective:

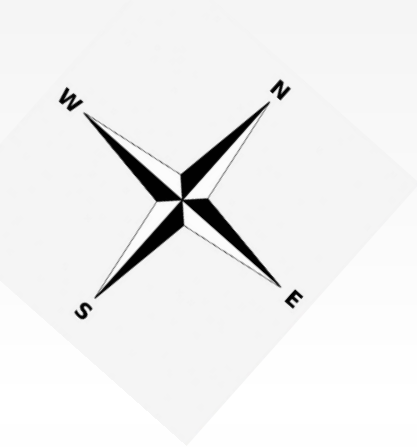
Base: D/B Team Recommended | Highly Preferred Recommendation | Preferred Recommendation | Not Recommended

Storm Water Treatment System Location Options:

Design Build Team Recommended Base Comparison: Option 1



Option #1: Lincoln Court and Bay Road



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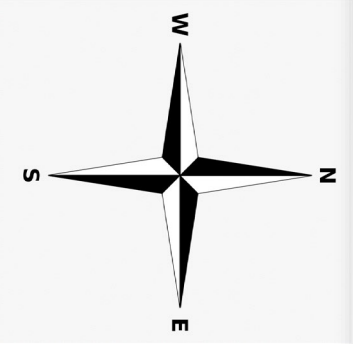

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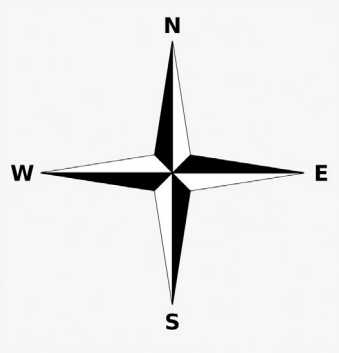

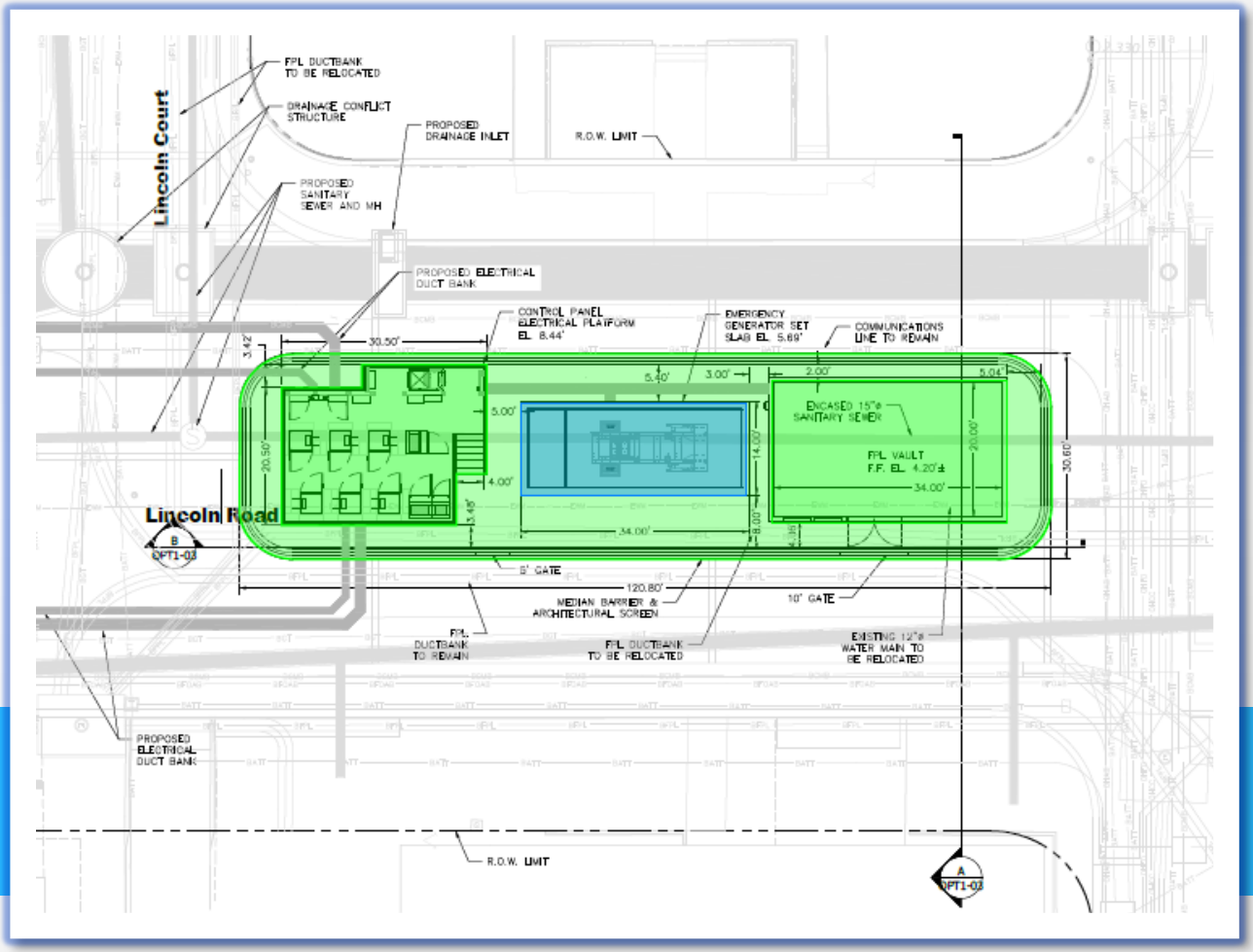

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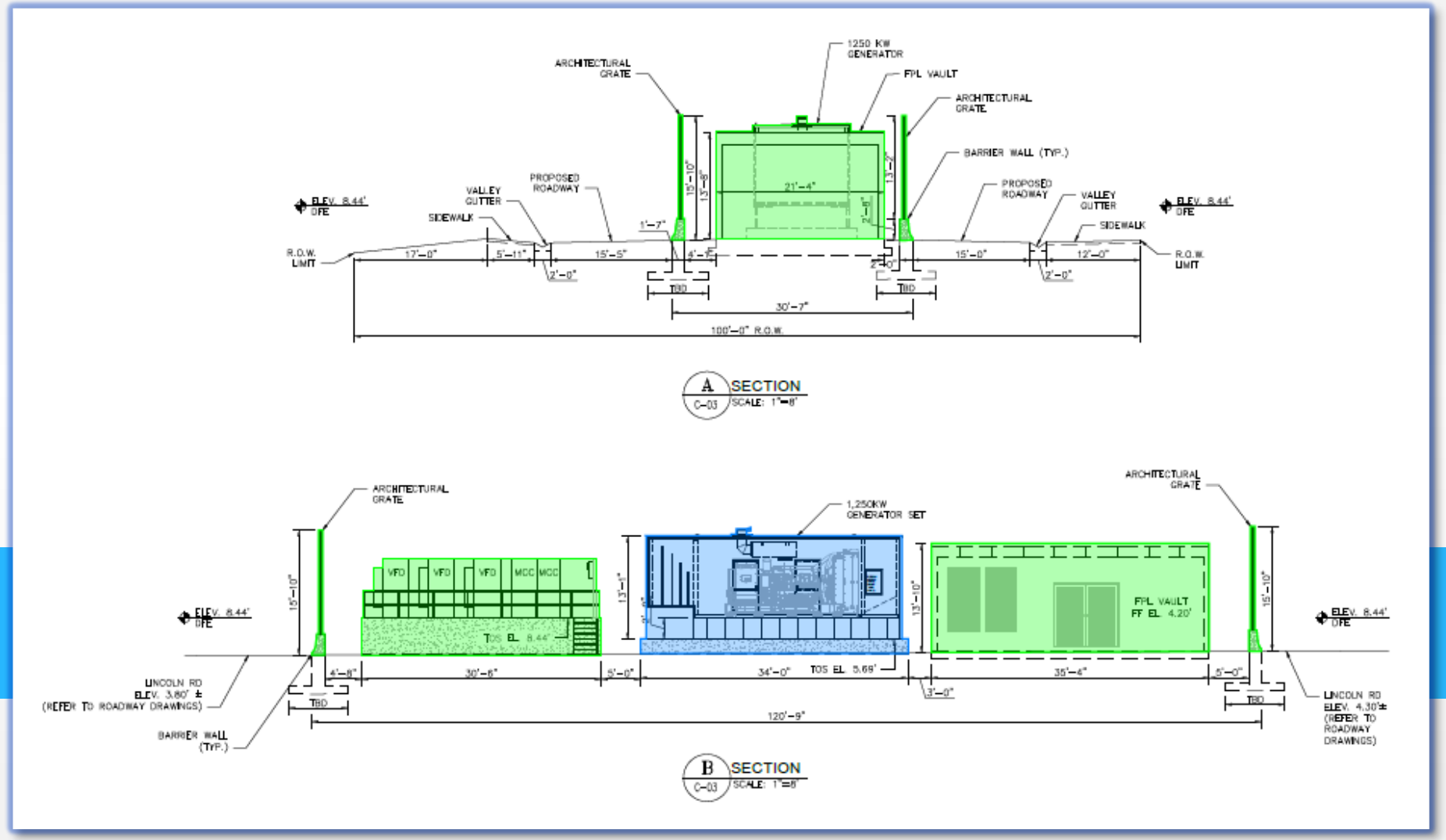

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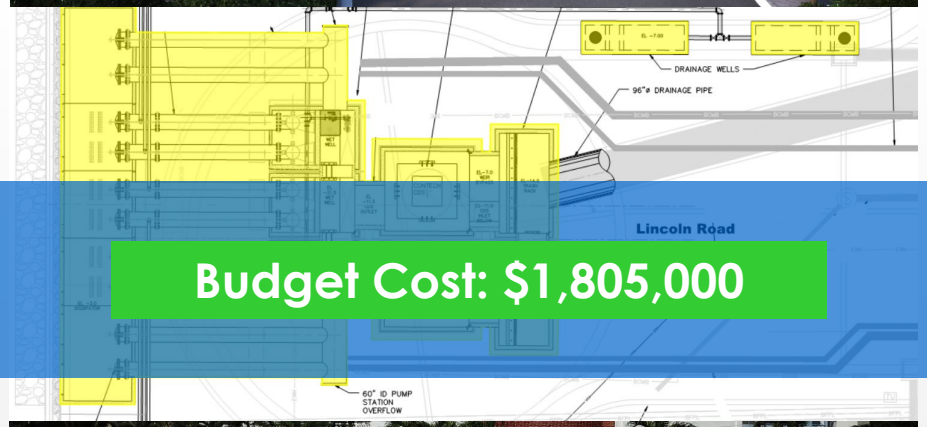

Advantages

- Emergency Gravity Bypass
- Traffic Calming & Promenade Atmosphere
- Above EQ in proximity of SWTS < 200'

Budget Cost: $1,805,000

Disadvantages

- Loss of On-Street Parking (26)
- Space Restriction for Deliveries/Drop Offs
- Large Structure in Median Height Concern
- Perceived Property Loss

Storm Water Treatment System Location Options:

Highly Preferred Recommendations: Option 2

Option #2: Control Panels at Lincoln Road;
All Other Components at 1671 West Avenue

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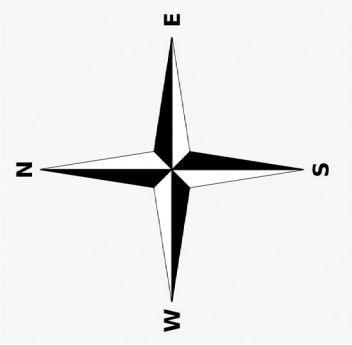
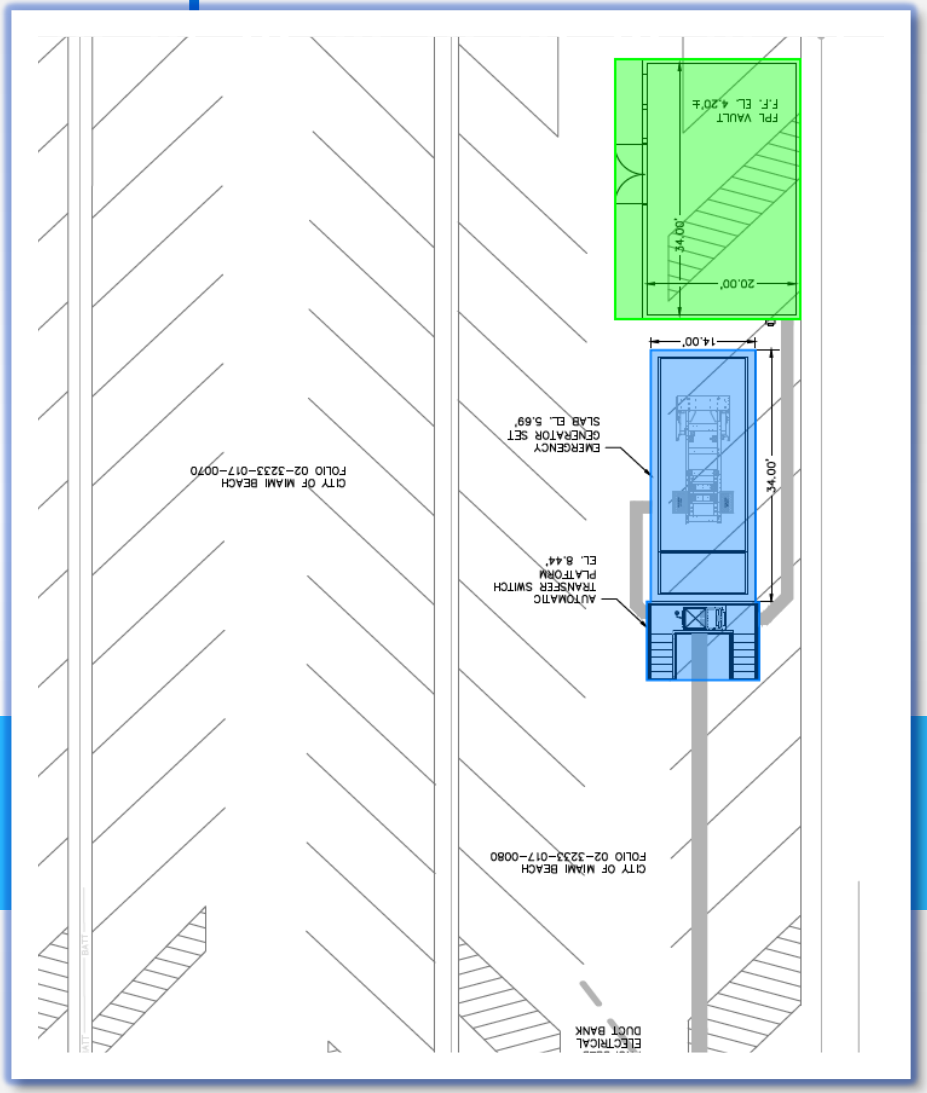
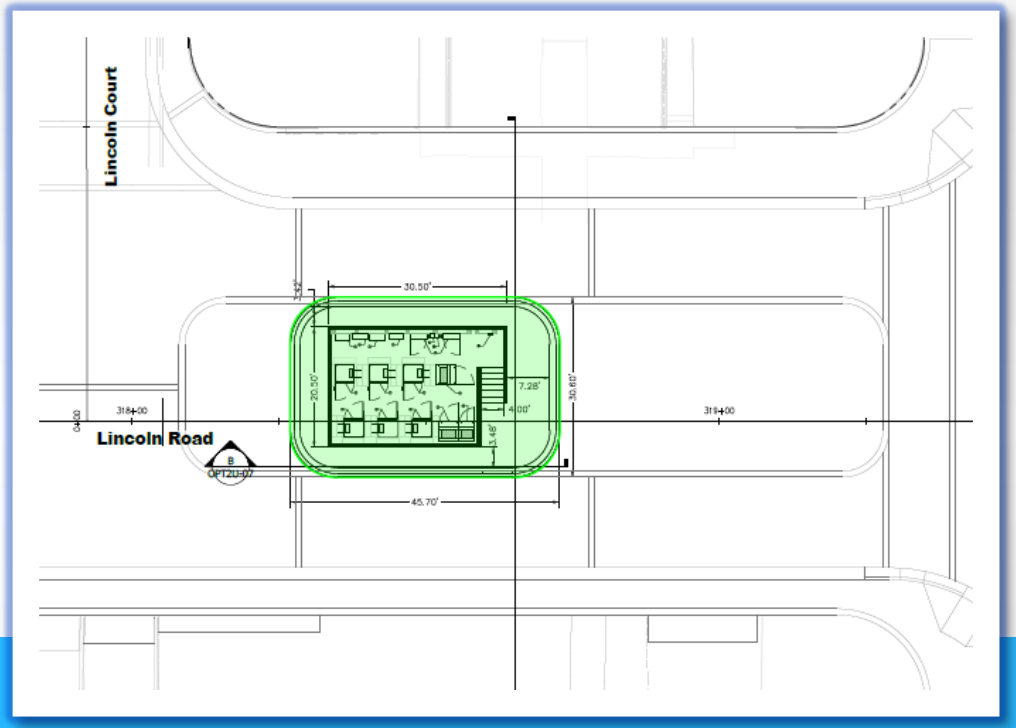
All Other Components at 1671 West Avenue



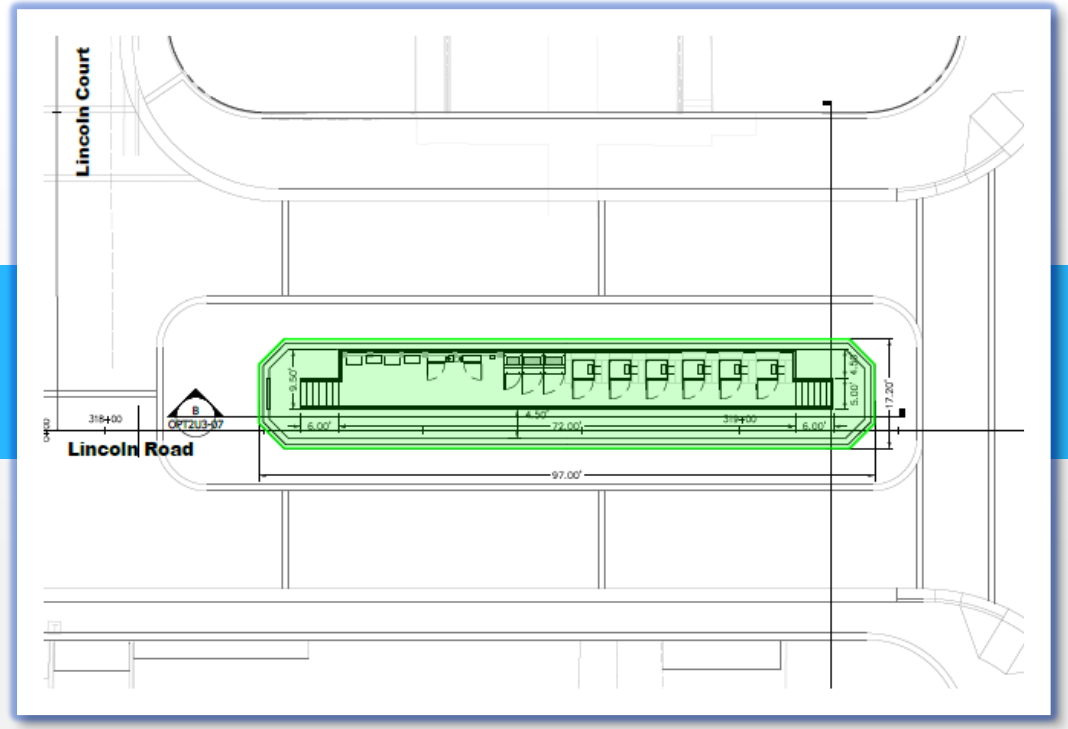


West Avenue

Option #2: Control Panels at Lincoln Road;
All Other Components at 1671 West Avenue



- Parking Recovery:
  - May be able to recover parking on north and South sides of Lincoln Road Street End (Requires Fire Department Approval)
  - May be able to incorporate two parking spaces behind the median control panels (Requires Fire Department Approval)



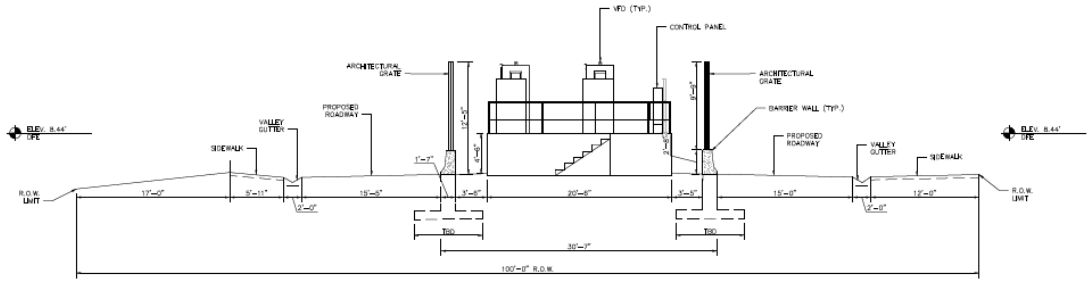
Revised Median Dimension:

30.6'x45.7'; Height: 12.5'

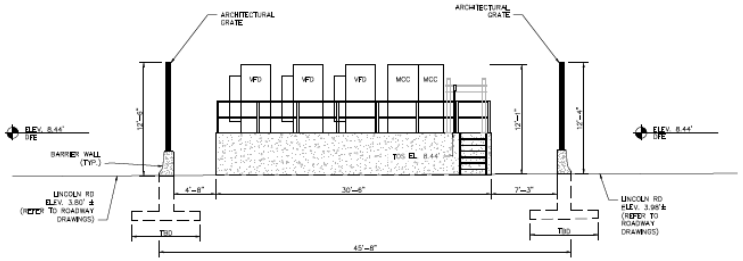
97.0'x17.2'; Height: 12.5'

Option #2: Control Panels at Lincoln Road;

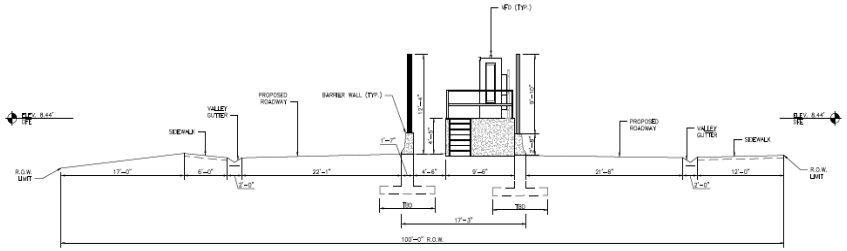
All Other Components at 1671 West Avenue



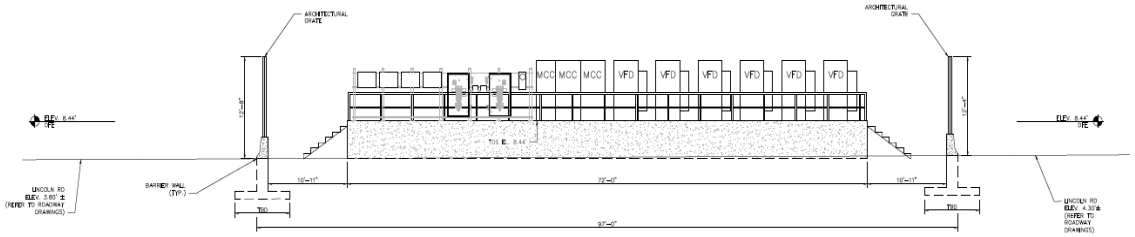
A SECTION
SCALE: 1"=8'



B SECTION
SCALE: 1"=8'



A SECTION
SCALE: 1"=8'



B SECTION
SCALE: 1"=8'

Option #2: Control Panels at Lincoln Road;
All Other Components at 1671 West Avenue

- Gravity Overflow Bypass
- Key Controls Close to SWTS < 200'
- Traffic Calming & Promenade Atmosphere
- Possibly Save residential parking spots at the Lincoln Road Street End (14)

- Utility Interference/Conflicts at the intersection of Lincoln Road and West Avenue
- Median Structure
- Perceived Property Loss
- Loss of Resident Street Parking spots (10) between Lincoln Court and Bay Road
- Loss of Parking Spots (14) at 1671 West Avenue

Advantages

Budget Cost: $2,620,000
Δ To Option 1: $815,000

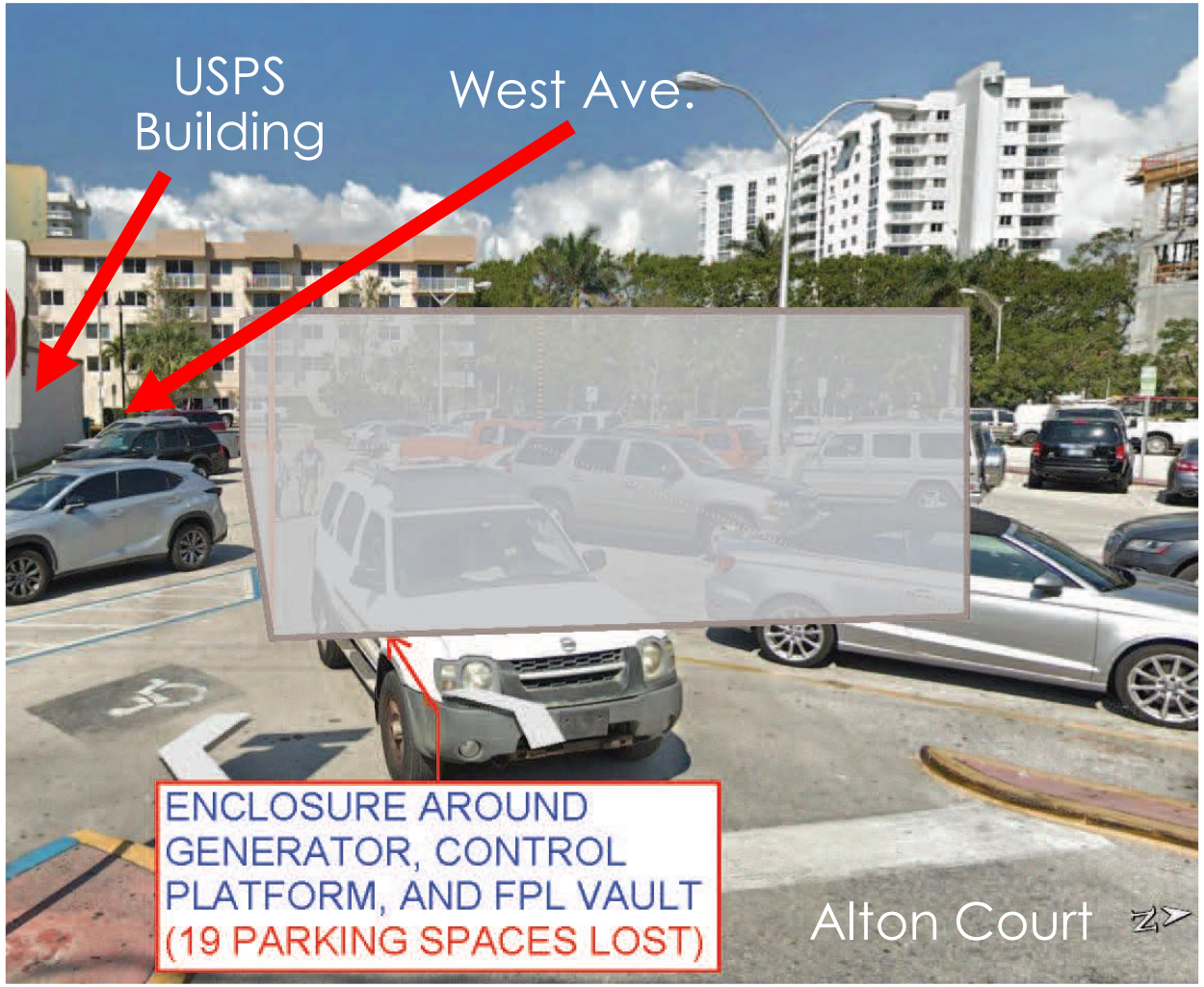
Disadvantages

Storm Water Treatment System Location Options:

Preferred Recommendations: Options 3, 3A, 6 & 9

Option #3: Full SWTS to 1671 West Ave.

Discharge to Lincoln Road



Option #3: Full SWTS to 1671 West Ave.

Discharge to Lincoln Road

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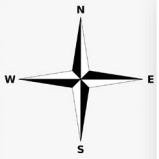
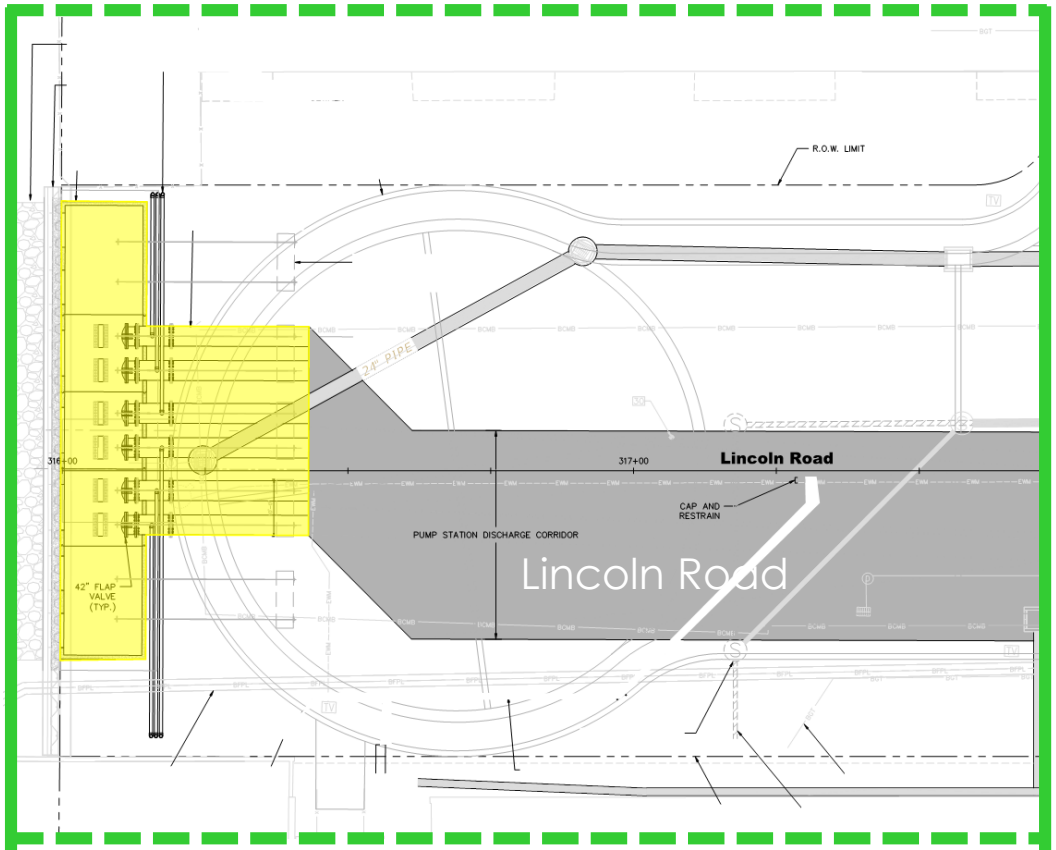
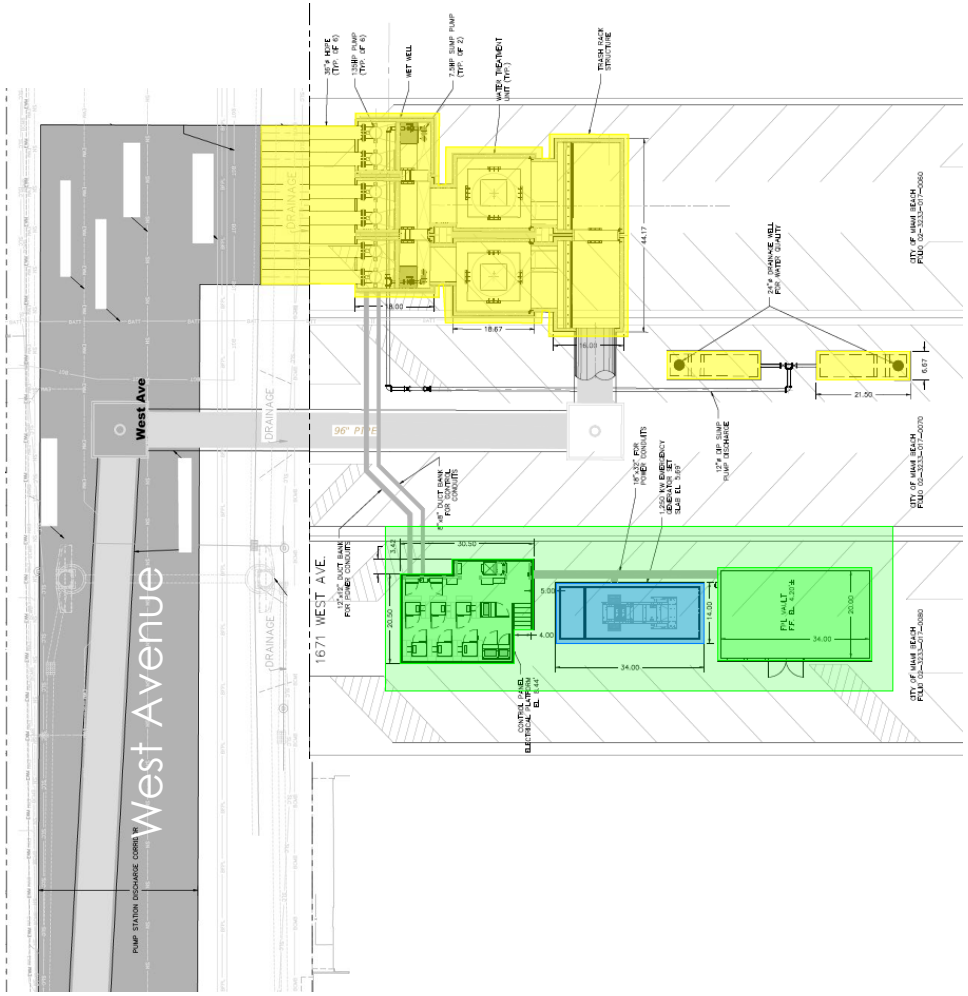
Discharge to Lincoln Road







Option #3: Full SWTS to 1671 West Ave.

Discharge to Lincoln Road

- Multiple Force Main - 1,200' to Lincoln Road/Utility Interferences – Possible Tunnel
- Loss of Bypass Emergency Overflow Piping
- Loss of Public Parking (31)
- Cost Impact: $1.5M > Option 1
- Construction Time Impact: 360 Days

- Resident Satisfaction
- No Loss of On Street Parking

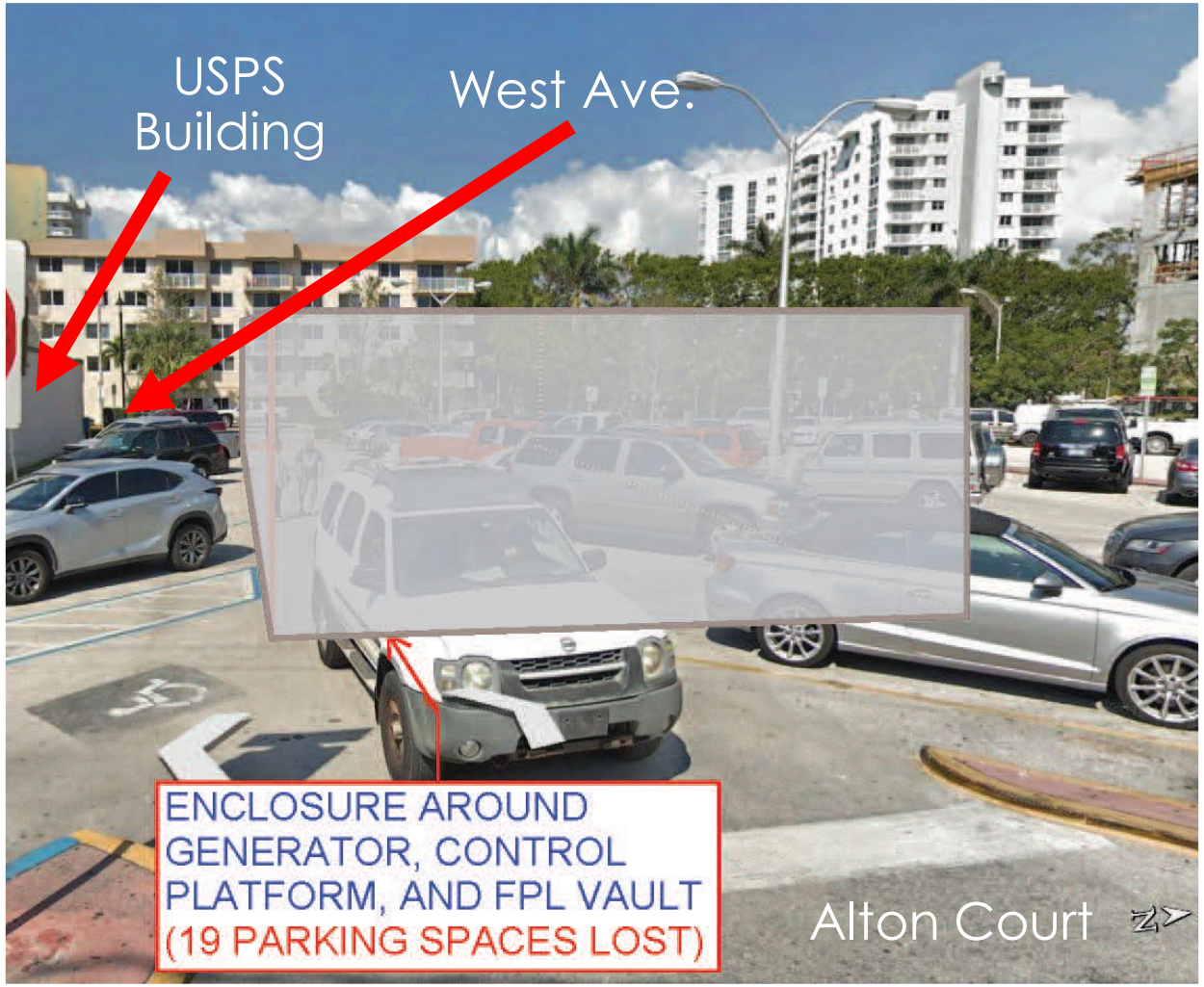
Advantages

Budget Cost: $4,296,000
Δ To Option 1: $2,491,000

Disadvantages

Option #3A: Full SWTS to 1671 West Ave.

Discharge to 17th Street

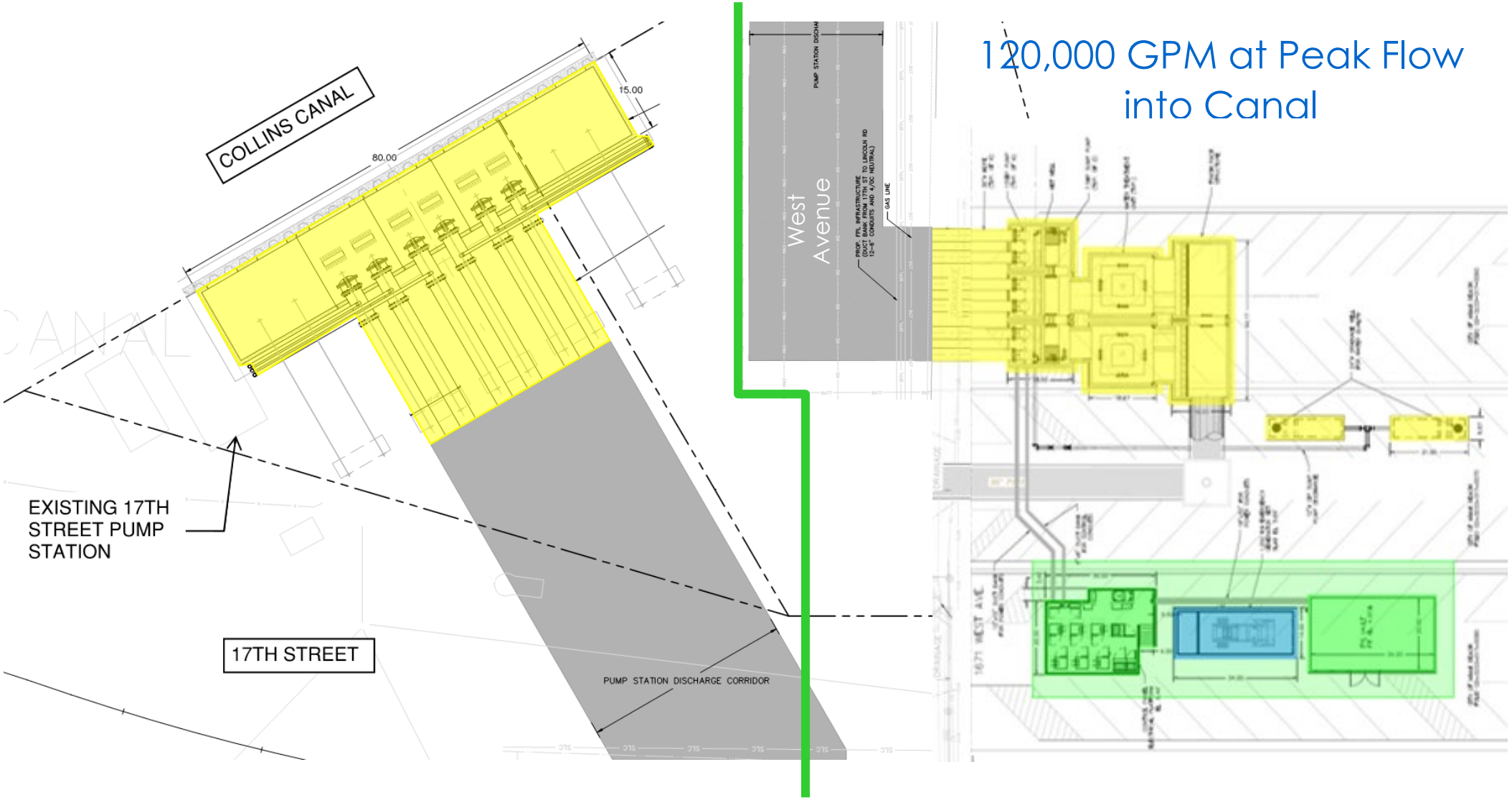


Option #3A: Full SWTS to 1671 West Ave.

Discharge to 17th Street

Option #3A: Full SWTS to 1671 West Ave.

Discharge to 17th Street



Option #3A: Full SWTS to 1671 West Ave.

Discharge to 17th Street

- Multiple Force Main 400' to 17th Street/Utility Interferences – Possible Tunnel
- Loss of Bypass Emergency Overflow Piping
- Loss of Public Parking (31)
- Cost Impact: $1M > Option 1
- Construction Time Impact: 325 Days

- Resident Satisfaction
- No Loss of On Street Parking

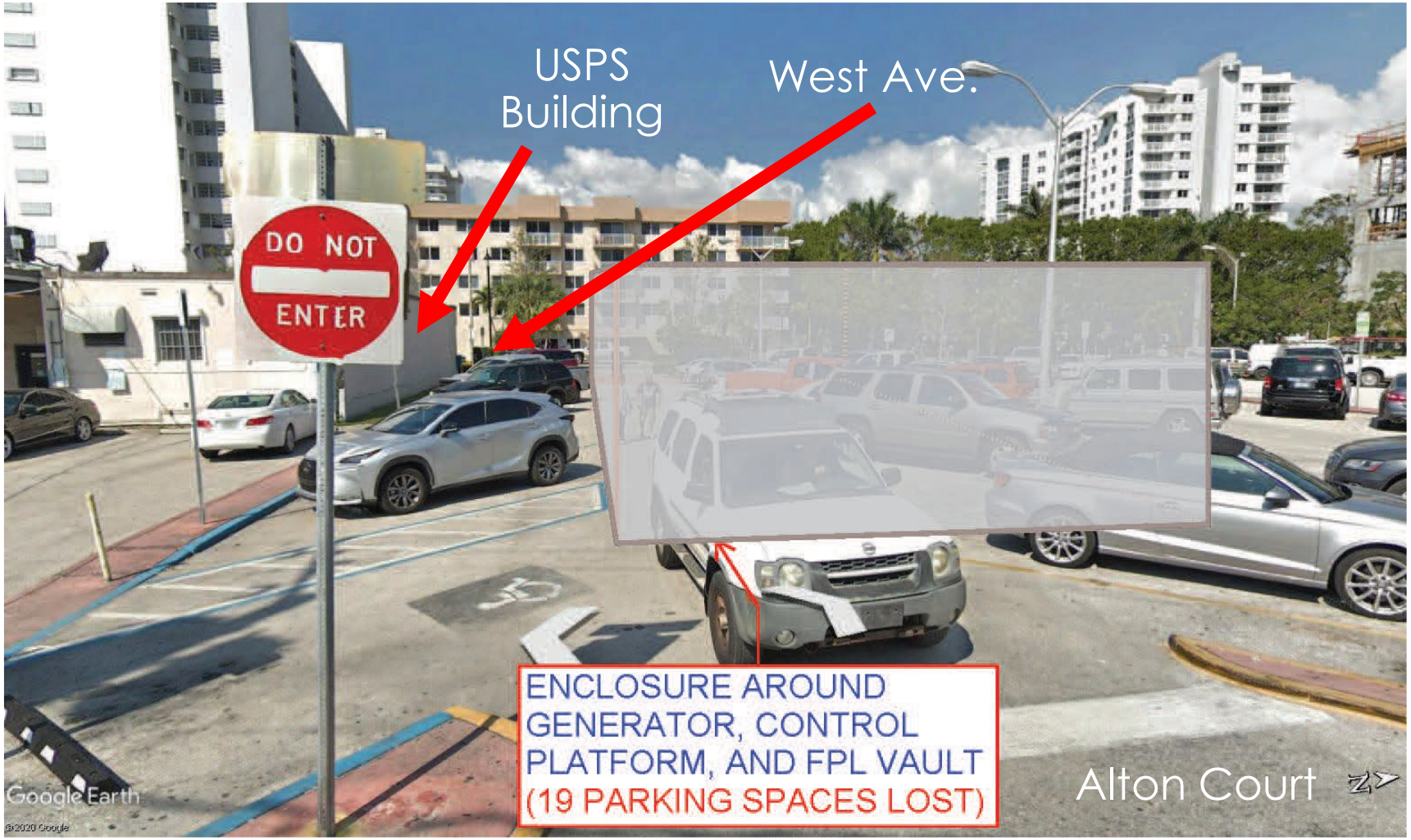
Advantages

Budget Cost: $2,875,000
Δ To Option 1: $1,070,000

Disadvantages

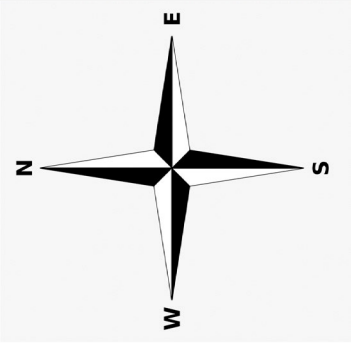
Option #6: Above Ground to 1671 West Ave.

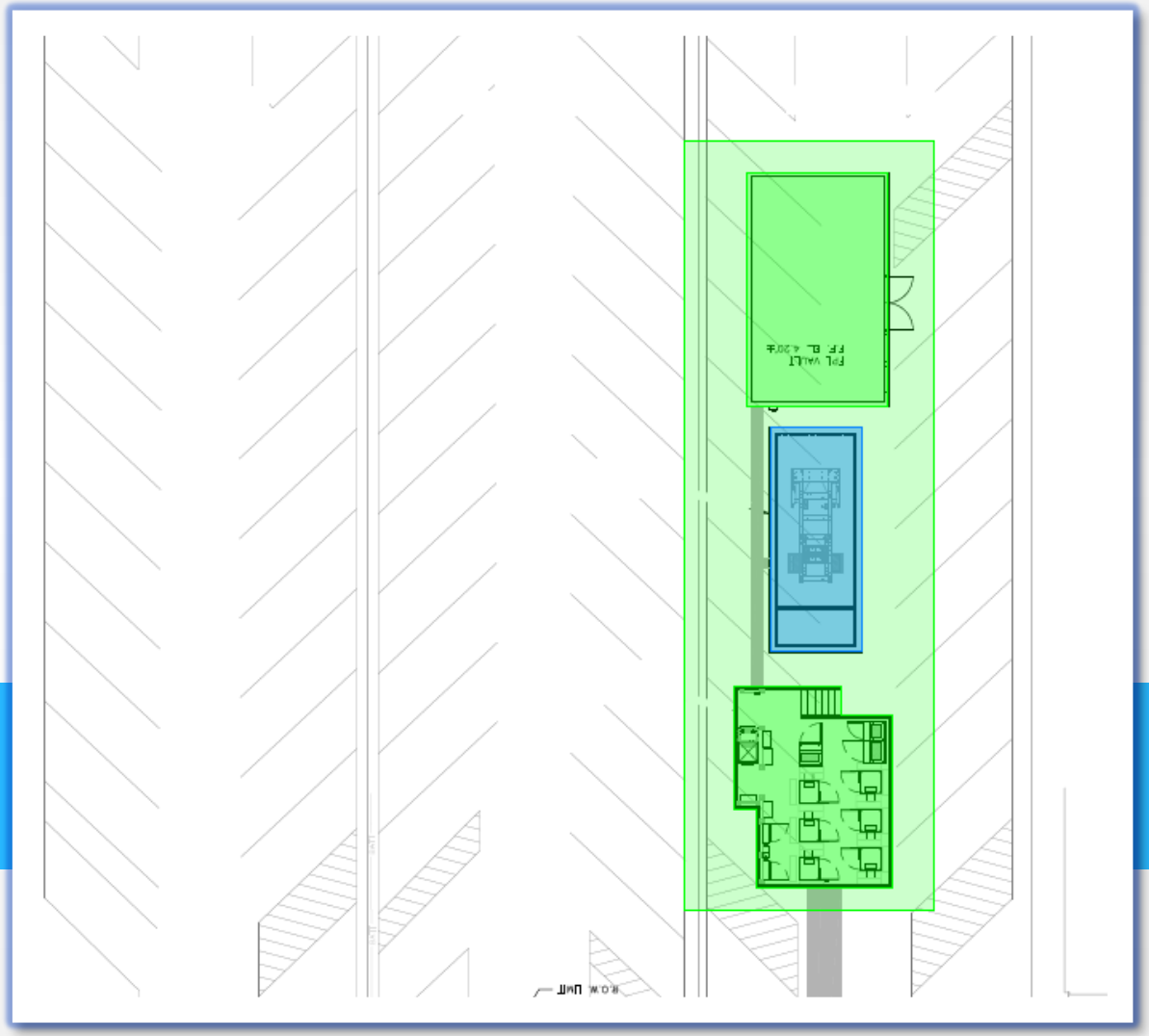
SWTS at Lincoln Road



Option #6: Above Ground to 1671 West Ave.

SWTS at Lincoln Road

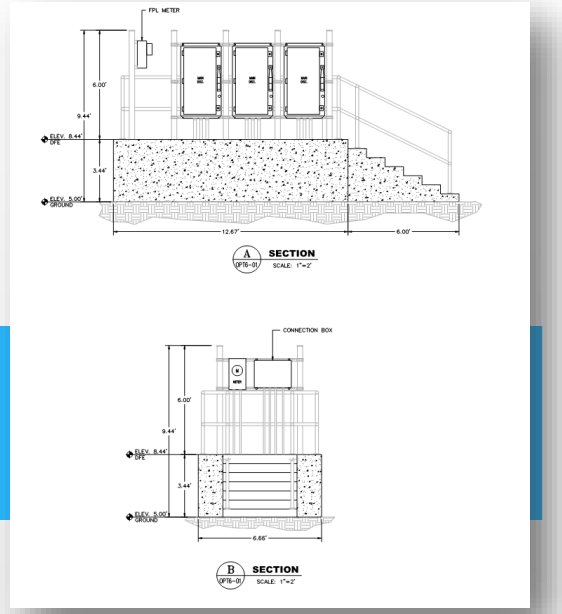


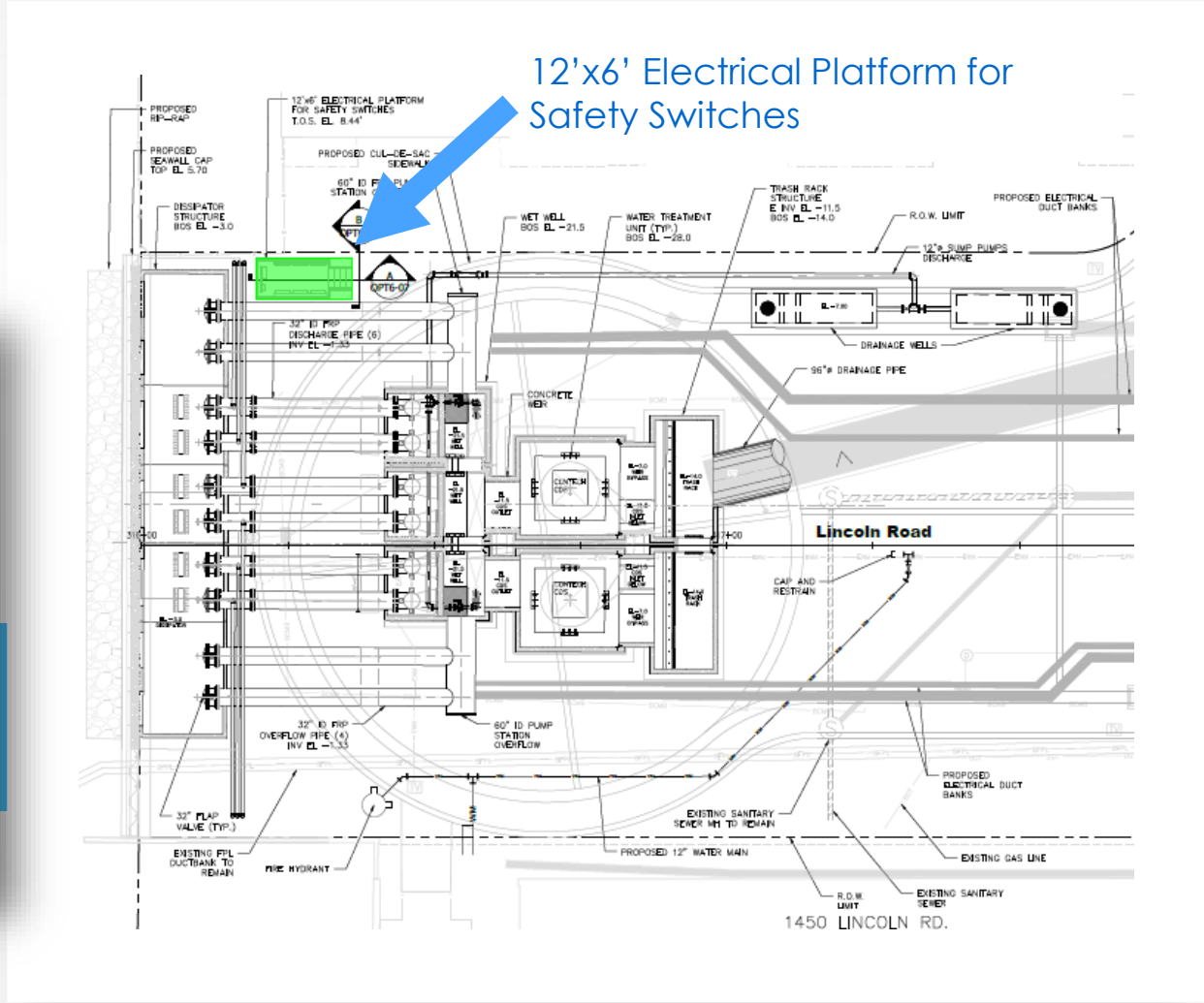


West Avenue

Option #6: Above Ground to 1671 West Ave.

SWTS at Lincoln Road





Pump Disconnect Panels:

- Due to the distance between the control panels and the underground components of the water treatment system, we will be required to install pump disconnect panels for safe operation

Pump Disconnect Switch Dimension:

12'x6'; Height: 12'

Option #6: Above Ground to 1671 West Ave.

SWTS at Lincoln Road

- No Loss of On Street Parking
- Resident Satisfaction

- Above Ground EQ Isolated > 1,000' to SWTS
- DPW Addition of Personnel and Training to Manage SWTS Operation Required
- Added Power and Communication Cables
- Loss of Public Parking (19) at 1671
- 1,200' to SWTS, No Line of Sight Safety & Maintenance Issues
- Not Best Engineering Practice

Advantages

Budget Cost: $1,857,000
Δ To Option 1: $52,000

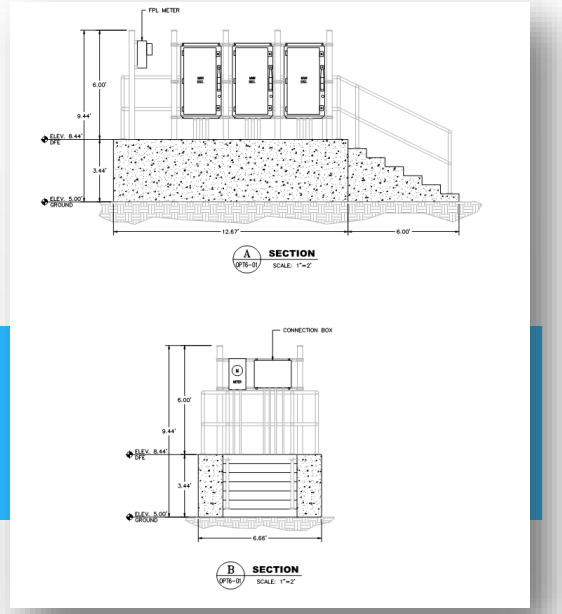
Disadvantages

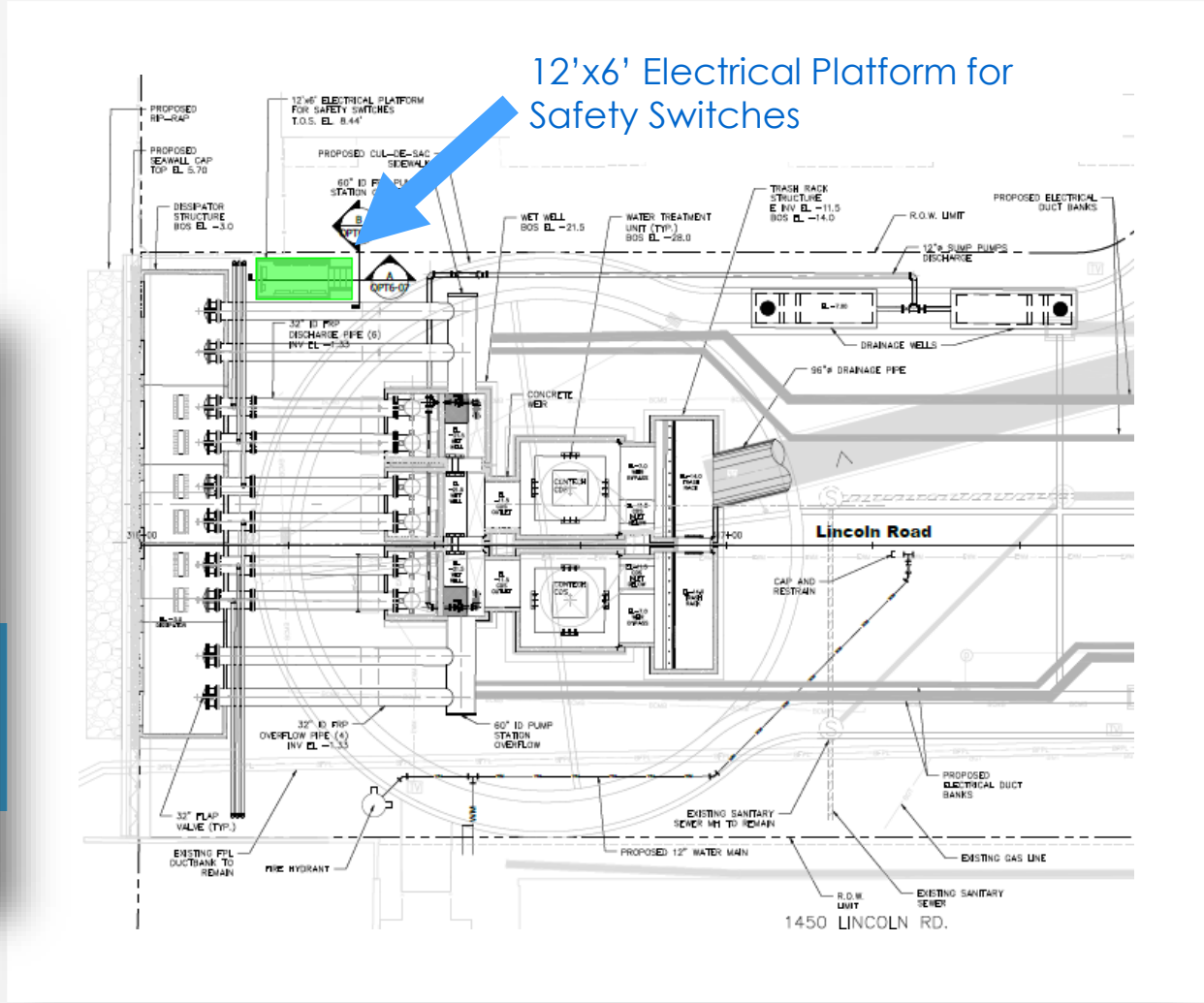
Option #9: Above Ground to 1625 West Ave.

SWTS at Lincoln Road

Option #9: Above Ground to 1625 West Ave.

SWTS at Lincoln Road





Pump Disconnect Panels:

- Due to the distance between the control panels and the underground components of the water treatment system, we will be required to install pump disconnect panels for safe operation

Pump Disconnect Switch Dimension:

12'x6'; Height: 12'

Option #9: Above Ground to 1625 West Ave.

SWTS at Lincoln Road

- Above Ground EQ Isolated > 1,000' to SWTS
- DPW Addition of Personnel and Training to Manage SWTS Operation Required
- Added Power and Communication Cables
- Loss of Public Parking (8) at 1625
- 1,000' to SWTS, No Line of Sight, Safety/Maintenance Issue
- Not Best Engineering Practice

- Resident Satisfaction /Above Ground EQ Isolated
- No Loss of On-street Parking

Advantages

Budget Cost: $1,810,000
Δ To Option 1: $5,000

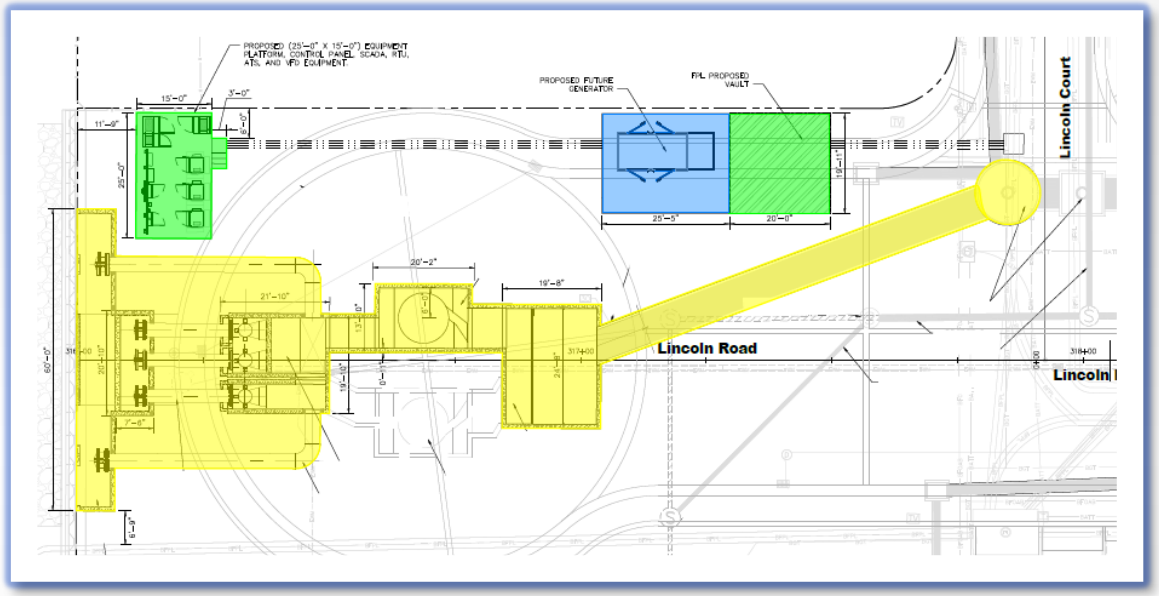
Disadvantages

Storm Water Treatment System Location Options:

Not Recommended

Option #4: 5-year Storm – 10-year Piping Only

- Gravity Overflow Bypass
- Above EQ Proximity to SWTS < 200'
- Cost Savings $4.4M < Option 1



- Perceived Property Loss
- Future Construction Considerations 10 year
- Above Ground Structures Blocking Views
- Loss of Resident Street Parking (16)
- Violates Commission Resolution / Loss of Pump Capacity

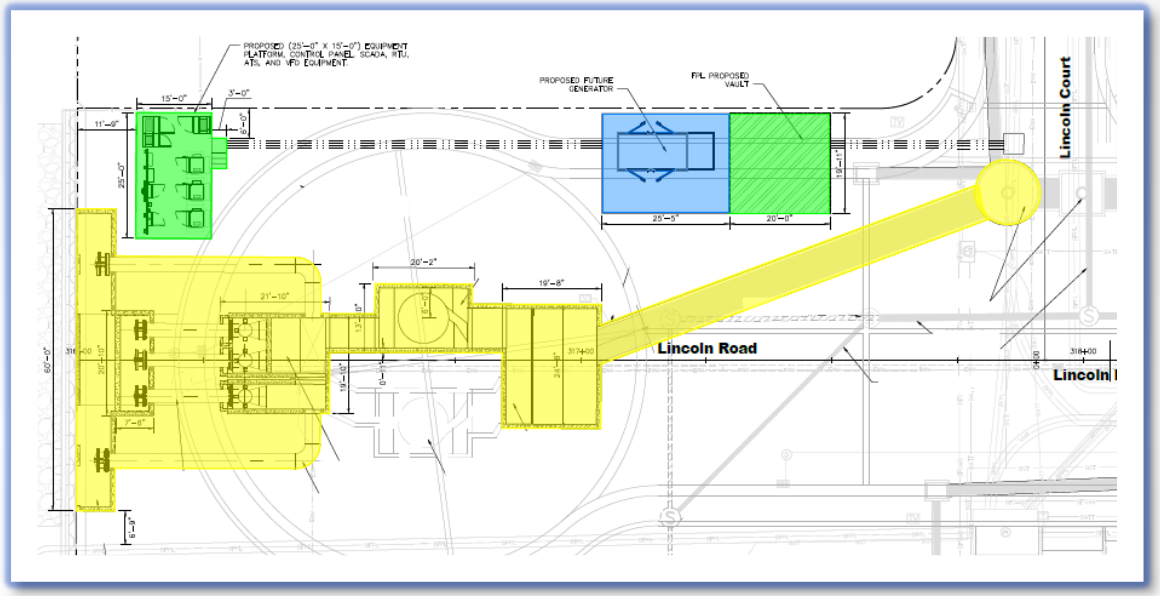
Advantages

Budget Cost: $($2,632,876)
Δ To Option 1: ($4,437,876)

Disadvantages

Option #4A: 5-year Storm – 10-year Footprint

- Gravity Overflow Bypass
- Above EQ Proximity to SWTS < 200'



- Space Restrictions/ Deliveries, Drop Off
- Perceived Property Loss
- Large Structure in Median
- Height Concerns
- Loss of Resident Street Parking (26)
- Violates Commission Resolution / Loss of Pump Capacity

Advantages

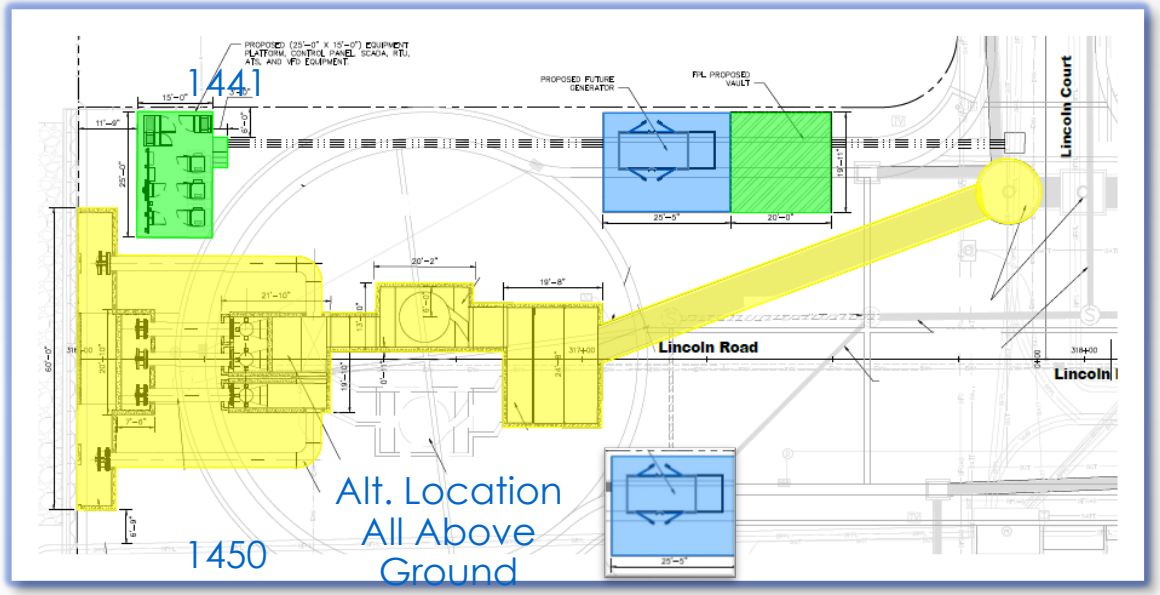
Budget Cost: $2,028,900
Δ To Option 1: $223,900

Disadvantages

Option #5: Two Water Treatment Systems

Bay Road & Lincoln Road

- Gravity Overflow Bypasses
- Redundancy: 2 - 60,000 gpm SWTS Locations



- Loss of Resident Street Parking (12)
- Structures Blocking Views Multiple Locations
- Space Limitations

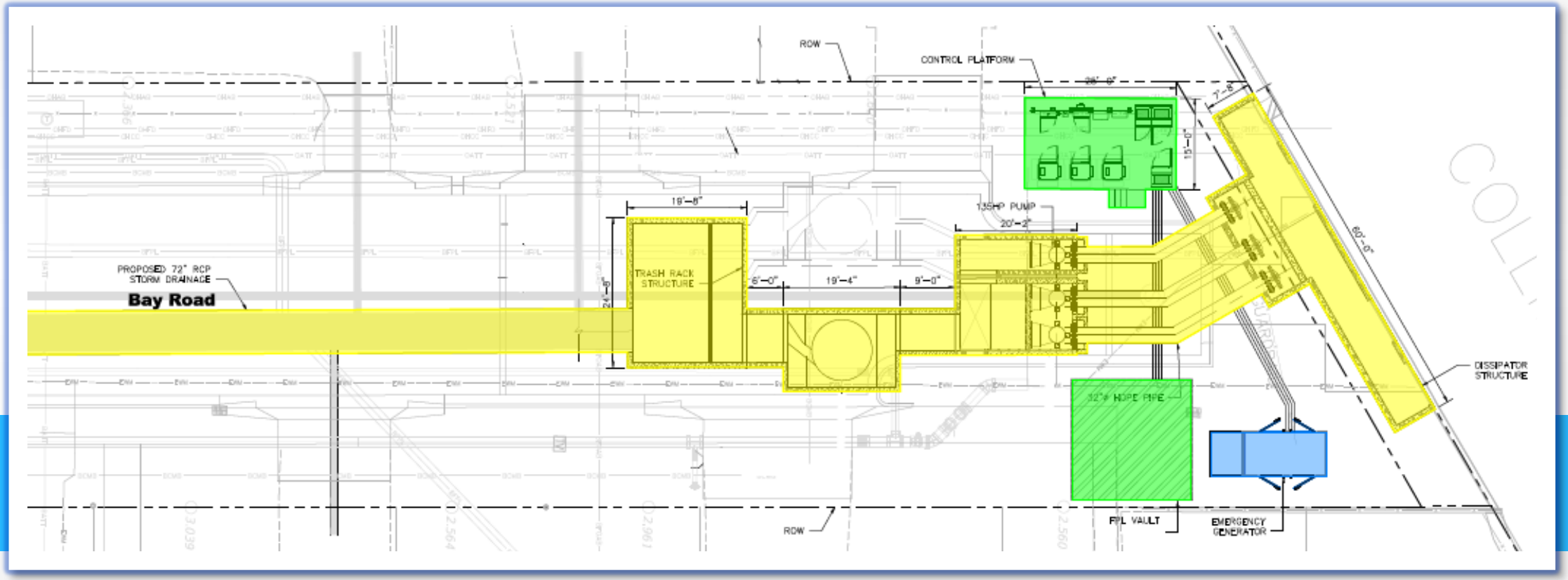
Advantages

Budget Cost: $2,129,076
Δ To Option 1: $324,076

Disadvantages

Option #5: Genset & FPL Vault at 1441

Option #5: Bay Road Location

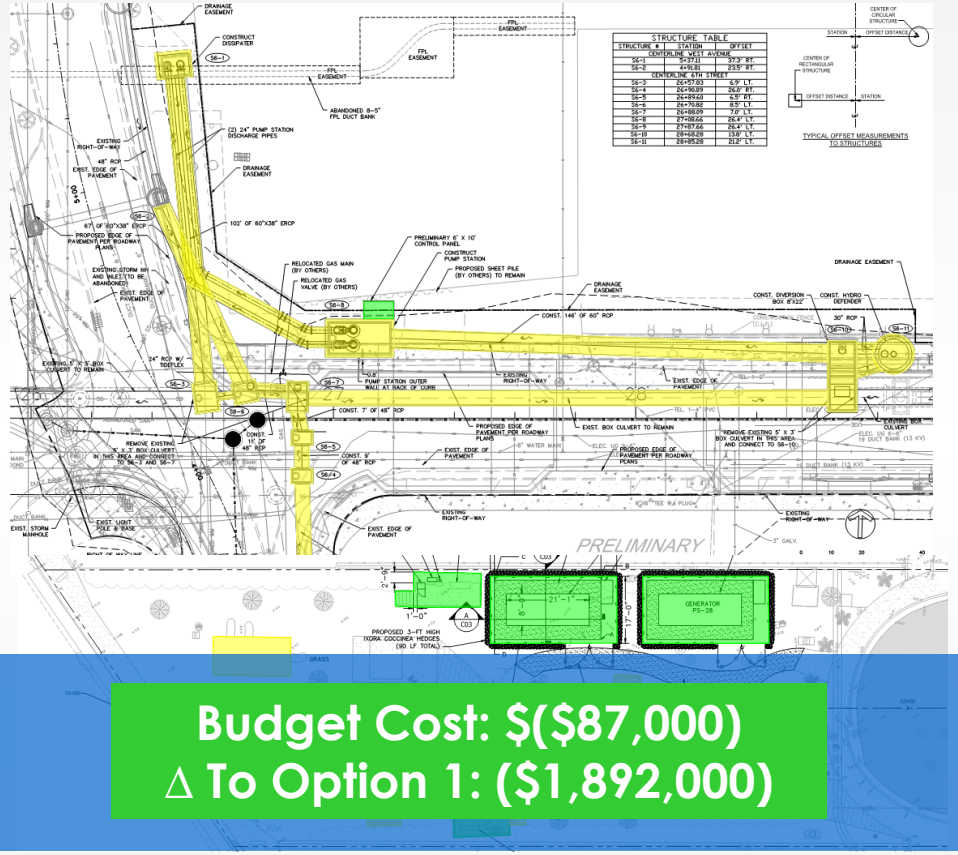


Option #5: Bay Road Location

Option #5: Bay Road Location

Option #7: 6th Street

Upgrade 6th, 10th & 14th St. Storm Water Treatment Systems & Lincoln Road to 60,000 gpm



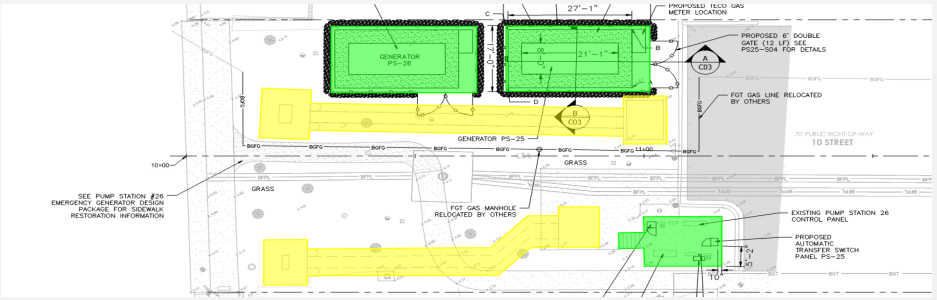
Advantages

- Cost Savings: $3M < Option 1
- Addresses Regulatory Issues – Capacity/Efficiency
- Reduction in Storm Water Pipe Sizes

Budget Cost: $($87,000)
Δ To Option 1: ($1,892,000)

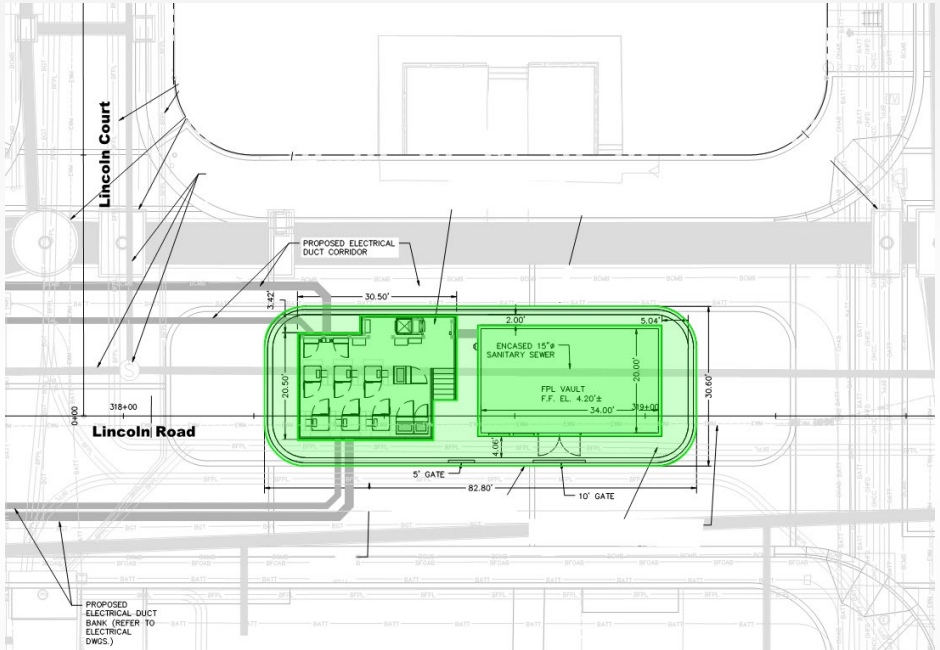
Disadvantages

- Design Upgrades to Three (3) Existing Pump Stations
- Downsize Lincoln Road Water Treatment System
- Project Delay: 480 Days



Option #8: Eliminate Gen Set at Lincoln Road

- Gravity Overflow Bypass
- Minimize Median Obstruction
- Cost Savings: $1.3M < Option 1



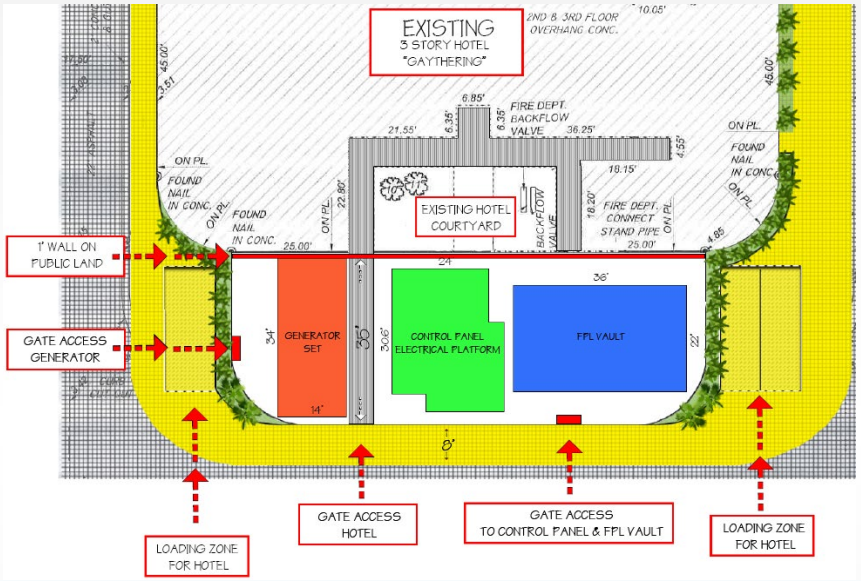
- Loss of Emergency Back-up Power

Advantages

Budget Cost: $468,537
Δ To Option 1: ($1,336,463)

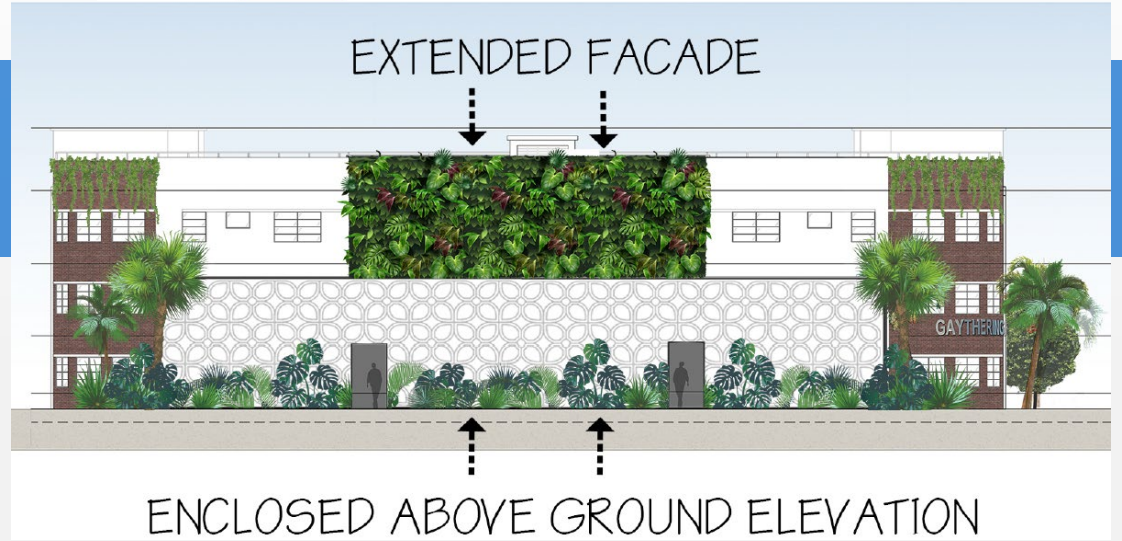
Disadvantages

Option #10: SWTS at Lincoln Rd;
All EQ Above Ground at Gaythering Hotel



- Emergency Gravity Bypass
- Above EQ in Proximity of SWTS
- Resident Satisfaction
- No Impact to Construction Duration
- Minimal Cost Impact

Advantages



- Loss of Street Parking
- Requires Agreement between Property Owner and City

Disadvantages

Neighborhood Benefits

Project Benefits for Neighborhood

1

Prevents current street flooding during high tides and sea level rise protection.

2

Improves City's storm water management system for over 147 Acres in the West Ave. neighborhood to 10-year flood events.

3

Landscape improvements and enhancements at all local street ends.

Water Quality Improvements

DERM approved addition of wells to manage initial surge during heavy rain and flooding events.

Addition of CDS Vortex units at Lincoln Road PS for continuous screening of solids up to 120 microns.

Thank you!
Questions?

RIC-MAN CONST. FL, INC.
DEERFIELD BEACH, FLORIDA

ces CONSULTANTS