



# Complying with New Florida Backup Power Rules



**CONNECT THE DOTS.**

Collaboration in Health Care  
Planning, Design, & Construction

MARCH 17–20, 2019 | PHOENIX, AZ

International Summit & Exhibition on Health Facility Planning, Design, & Construction



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# Genset Services



Founded in 2003, located in Pompano Beach, FL.

Authorized Generac sales and service distributor for Southern Florida

Sole focus in power generation sales and service

Major emphasis of company is servicing and maintaining power systems for hospitals throughout south Florida

# JLRD Consulting Engineers



*Founded in 1991, based in West Palm Beach, FL*

*Our goal is to provide safe, cost effective engineering solutions utilizing state-of-the-art technology, innovation, and partnership, maximizing value for our clients“*

LISTEN – EVALUATE – COLABORATE – SOLVE

# Lourdes McKeen Residence



Located in West Palm Beach, FL

132 Beds Skilled Nursing and short term rehab

69 Independent Living Apartments

34 Assisted Living apartments



The background is a solid dark purple color. It features several overlapping circles of varying sizes, some of which are a lighter shade of purple. Thin, light-colored lines connect some of these circles, creating a network-like pattern. The overall aesthetic is modern and minimalist.

# Florida Cooling Rule

# Hurricane Irma



Strongest Atlantic storm in over a decade

Made landfall in Florida on September 10, 2017

Port of Miami closed for three days

# Hurricane Irma, By the Numbers

7.7M customers lost electricity (73%) with a peak of 6.7M  
4.4M without power 48 hours after landfall  
6.5 Million Floridians under direction to evacuate  
Estimated \$53B of damage across the state of Florida  
84 fatalities, state-wide

## Healthcare

350 NH lost power. 88 had to evacuate (700 facilities)  
1677 ALF lost power. 635 had to evacuate (3100 facilities)  
50% did not recover power within 2 days



# Tragedy in Hollywood Hills, FL

The Rehabilitation Center at Hollywood Hills

152 Bed Privately-Owned Nursing Home

Power outage for more than 3 days

Facility air conditioning was not connected to emergency generator

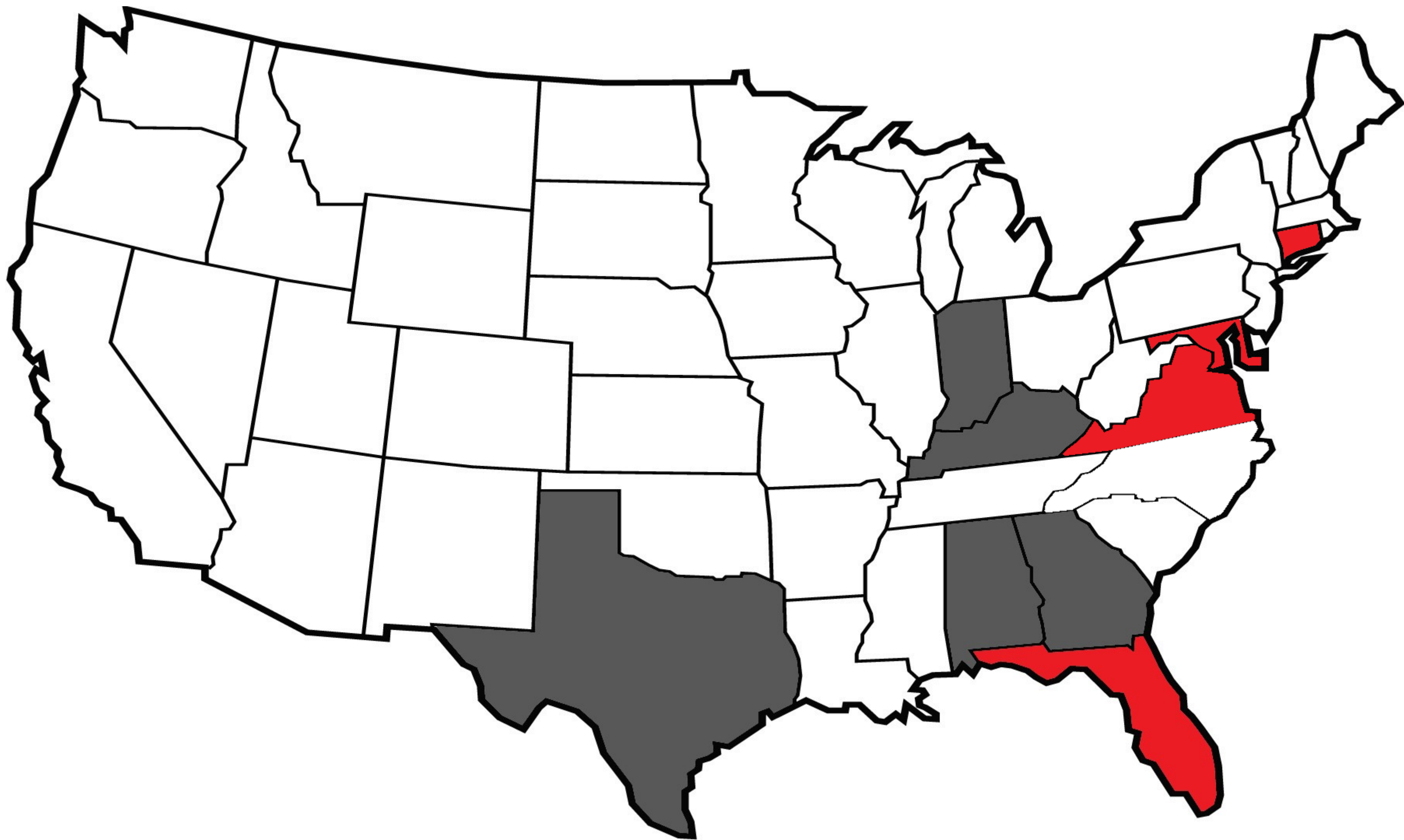
12 heat related deaths attributed to the hurricane

# Florida Emergency Power Rule

September 16, 2017 Governor Scott issued an emergency order for generators. This applies to every nursing home and ALF in the state. This was ratified by the state legislature in March of 2018. It calls for:

- File an Emergency Power Plan (EPP) with local EM authorities and AHCA
- Identify a cooling space for all patients/residences (20 ft<sup>2</sup> for ALF, 30 for SNF)
- Maintain 81F for 96 hours in the event of a loss of normal power
- Target enforcement date of June 1, 2018
- Installed and operational by January 1, 2019





States that have rules or are considering rules in their legislature

The background is a solid dark purple color. It features several overlapping circles of varying sizes in a lighter shade of purple. Some of these circles are connected by thin, light-colored lines, creating a network-like or molecular structure. The overall aesthetic is modern and minimalist.

# JLRD – Jason Carpentier

# General Design Considerations

- Owner/Code Requirements
- Begin Creative Evaluation Process of Options
- Existing Essential Electrical System Config.
- Existing Fuel Supply Runtime vs. New Fuel Storage
- Existing HVAC Load Config.  
(CHW/CT/SWUDs/DX/VRF/HP).
- HVAC Control Appurtenances (BMS/EMS).

# General Design Considerations

- Number of Services and Voltage/Phase Config.
- Grounding Config. of Services and Systems
- Demand Load History (Utility &/or Panels)
- Automatic Vs. Manual Transfer
- Location of Interfaces
- Paralleling vs. Single Gensets
- Equip. Space/Real Estate Allocation Required.

# General Design Considerations (Cont.)



- Fault Current and Selective Coord. Study
- Surge Protection (Power and Controls)
- Impact Protection & Sound Mitigation
- Lightning Protection
- Phasing
- Budget vs. Cost
- Owner/Code Requirements

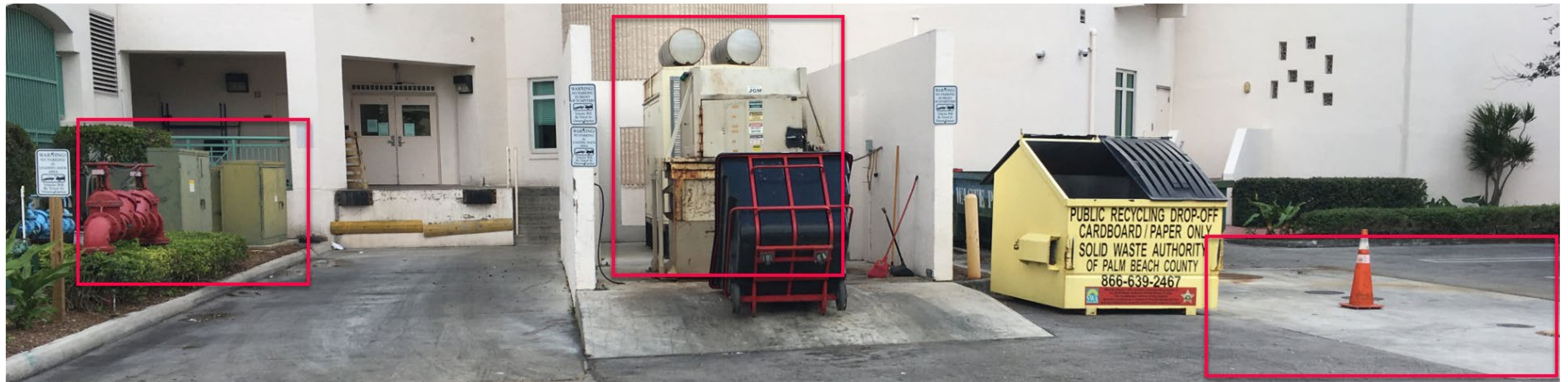


# Existing McKeen Towers System

- Two incoming utility services from serving utility pad mounted transformers.
  - One @ 2000A; 277/480V; 3-phase; 4-wire; Wye
  - One @ 3000A; 277/480V; 3-phase; 4-wire; Wye
- 600kW diesel currently on site for essential electrical systems and life safety.
- 4000gal underground diesel fuel storage tank.



# Existing McKeen Towers System





# Load/Sizing Considerations

## Options:

- Lifeboat – minimum load, powering AC for code-required space (20 ft<sup>2</sup> per resident for ALF, 30 ft<sup>2</sup> for SNF)
- Building cooling load only
- Whole House gen including essential systems

After review and discussion with the owner, the life boat and cooling-only solutions were not desirable to the facility management.

A whole-house solution was the design directive

# Challenges - Technical

- Space (underground garage, future construction)
- Existing underground utilities
- Interface to existing electrical systems
- Fuel storage on site vs. natural gas availability for bi-fuel option.
- Proximity of the generator to the property line.



# Challenges – Facility Operations

- Excavation and site prep
- Parking and loading dock access
- Scheduling outages and power transition vs. 24/7 operation
- Inspections: Local AHJ and AHCA
- Testing/Startup/Commissioning

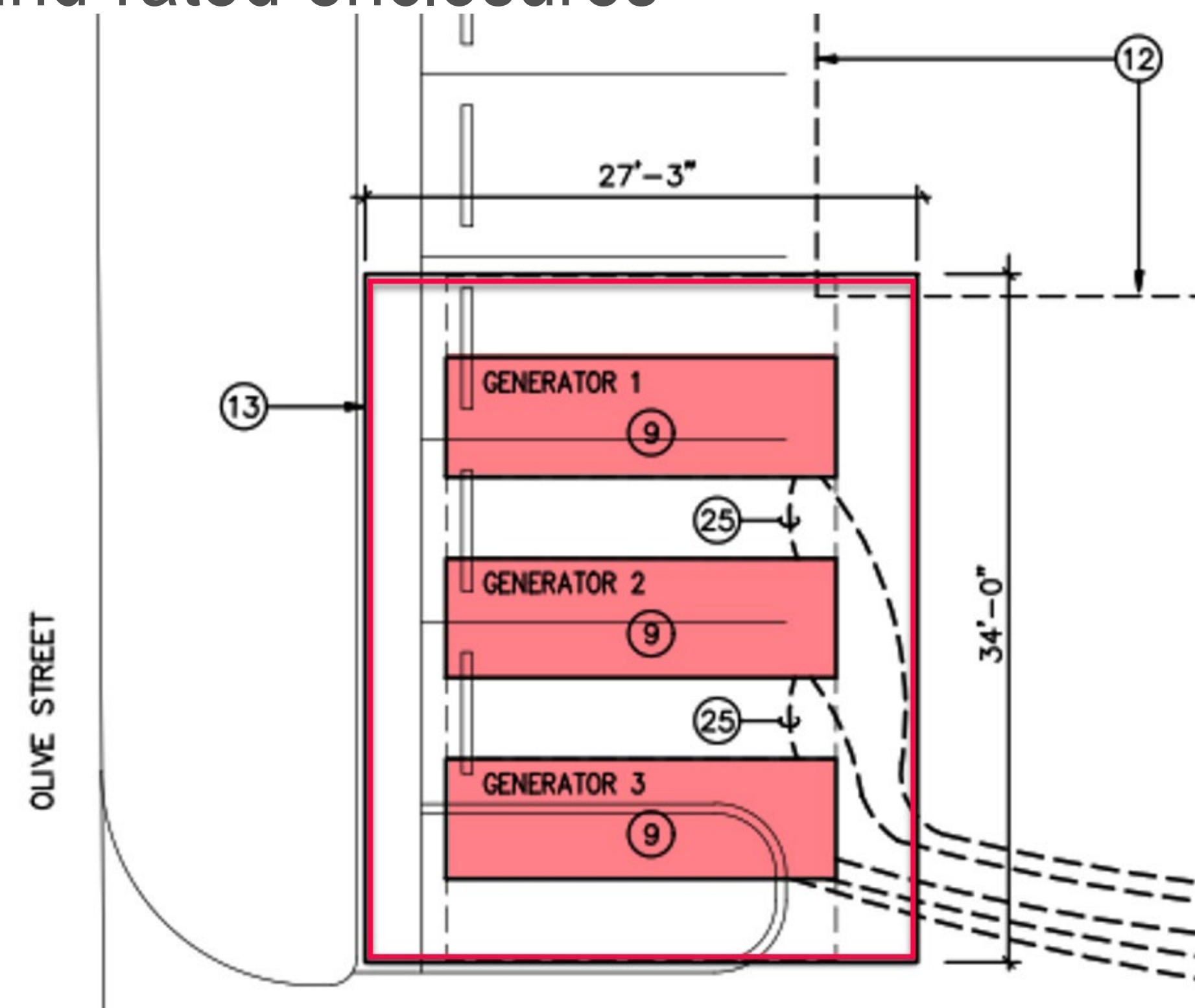


# Generator Sizing and Solutions

Utility data shows an annual maximum peak of 1124kWD.

Solution determined to be 1500kW with 200mph wind-rated enclosures

- Single 1500kW generator  
520" in length across five parking spaces  
52,000 lbs., no fuel. 73,000 lbs. with fuel
- 3x500kW generator solution  
408" in length across 3 parking spaces  
45,000 lbs., no fuel. 66,000 lbs. with fuel





# Generator Sizing and Solutions





# On Site Fuel – Bifuel Generators

Solution: 1500kW - 3x500kW bifuel generators. Simultaneous burn of diesel and NG  
Based on historical loading, system designed for maximum of 72% loading  
Generator rule calls for 96 hours of cooling support based on demand loading

Diesel only mode – 23.7gph per gen @75%

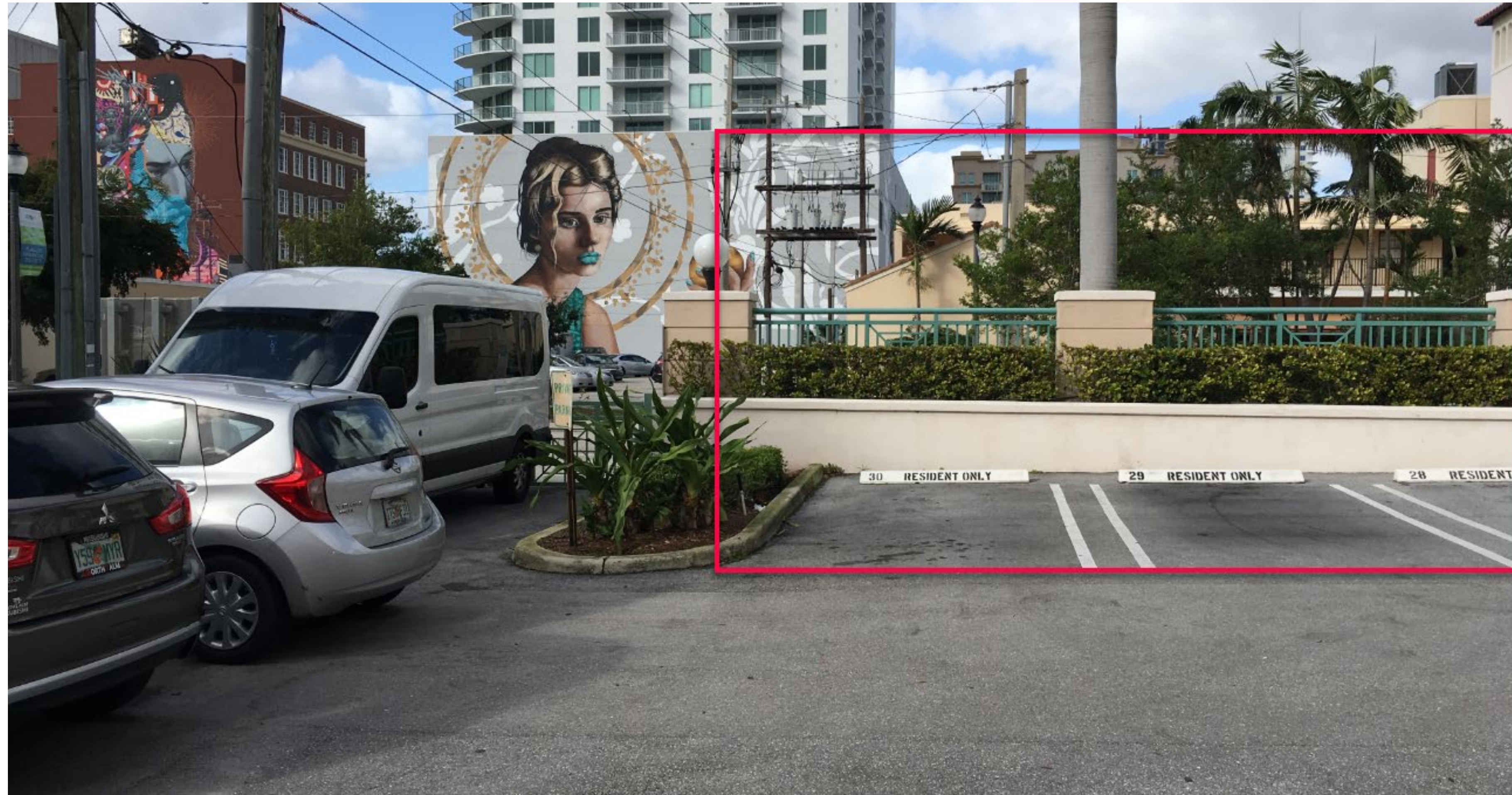
Bifuel mode – 14.5 gph per gen @75%

3-1000 gallons day tanks tied to 4000 gallon UST  
In bifuel mode this provides 161 hours of run time



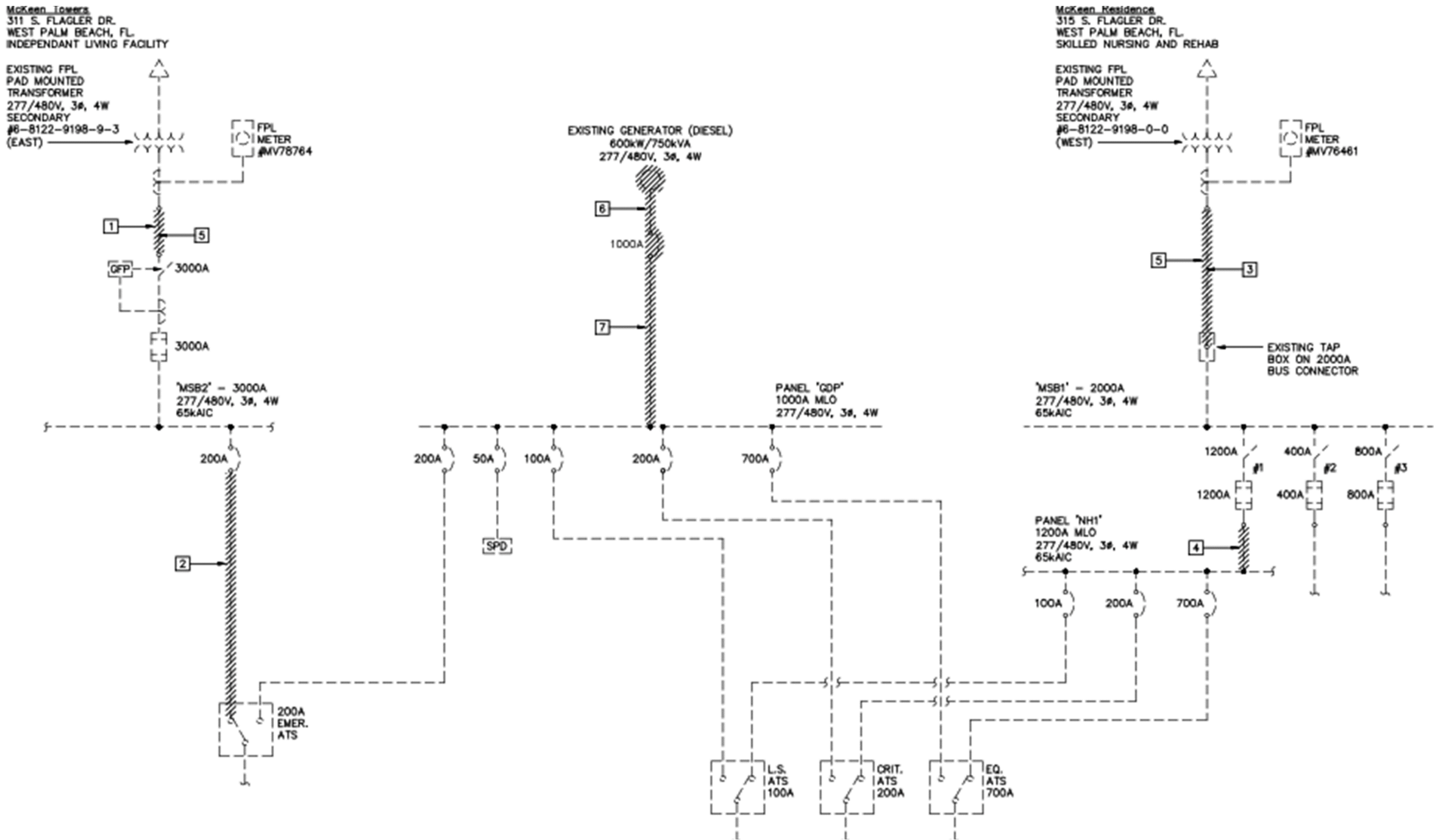


# On Site Fuel – Bifuel Generators





# Existing McKeen Towers System





# New Generator System

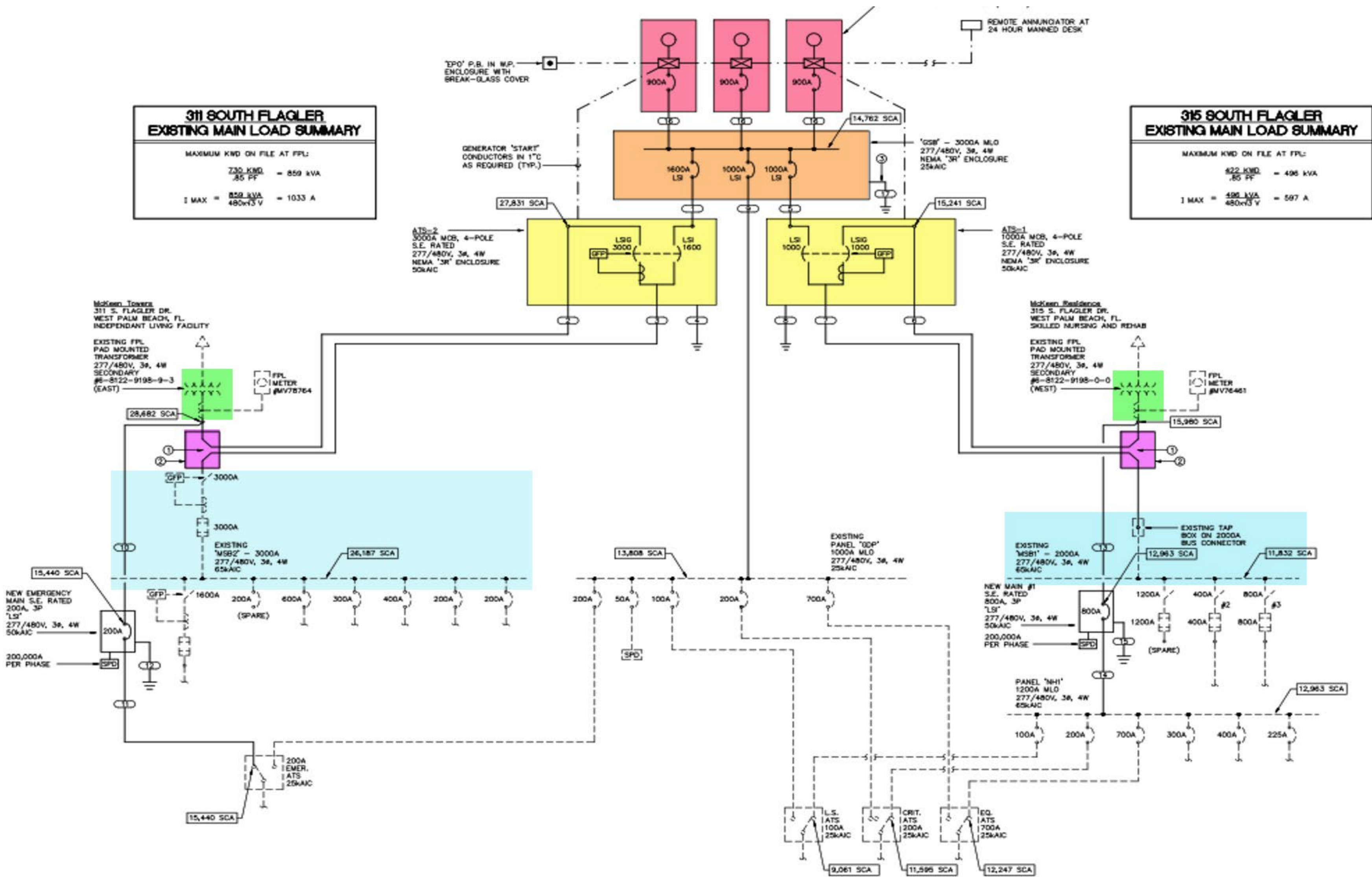
- 3x500kW Generac Bifuel Generators
- 3000A Gen Board
- 3x1000 Gal Tanks

## ILF

- 3000A ATS
- Emergency ATS

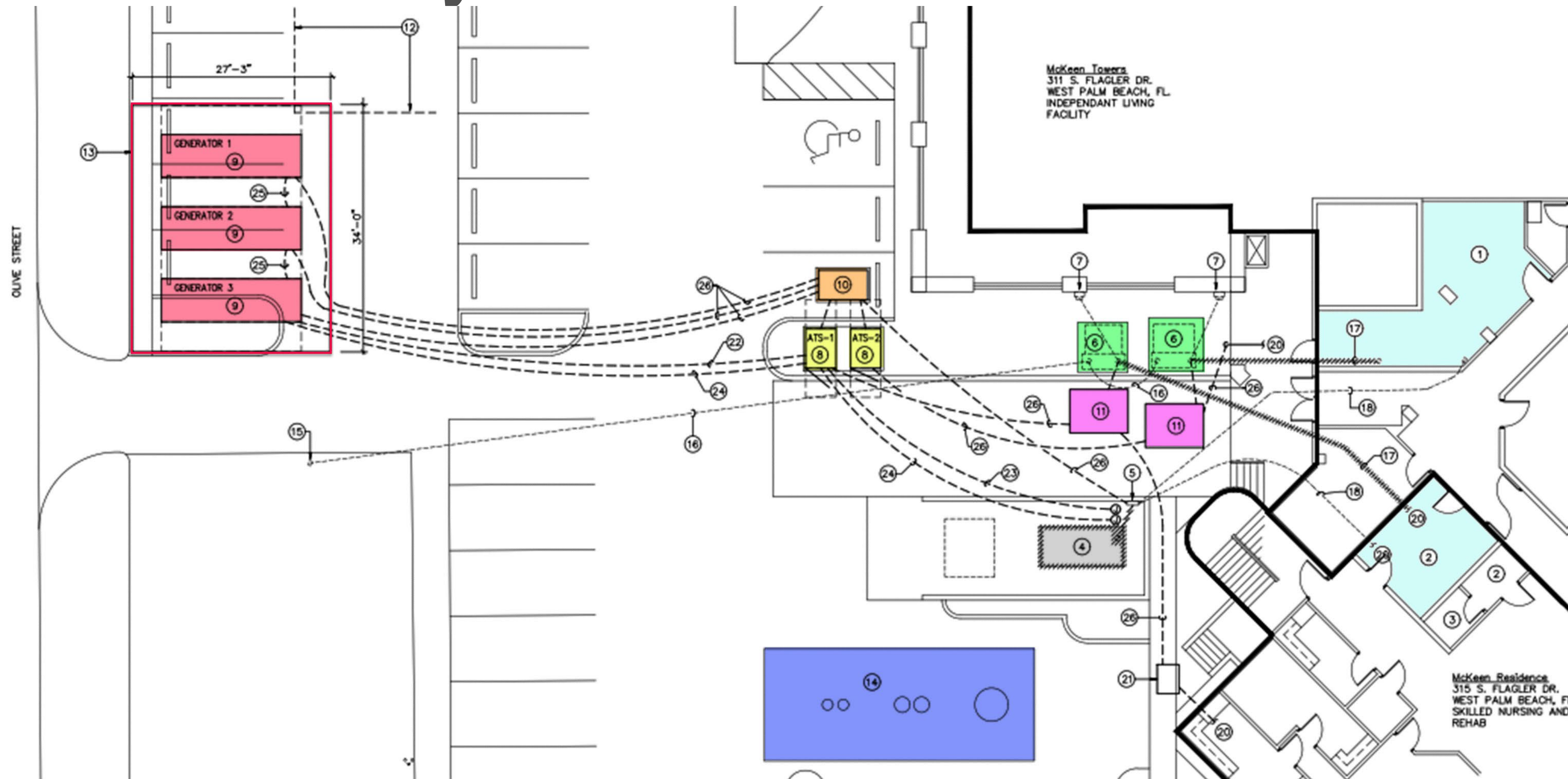
## SNF

- 1000A ATS
- Essential Systems ATSs





# New Site Layout





# Delicate Work – Utility Super Highway





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Lourdes Noreen  
McKeen – Darrell  
Sanford





Located on Site of the Historic Pennsylvania Hotel





## Mystery Steps to Nowhere



# Questions for Lourdes Noreen McKeen



- What were the previous efforts to look at standby generation?
- How did Irma effect your facility and the residents? Any significant damage?
- How much of an impact did the Governor's rule have on you versus acting on your own? Would you have done this anyway?
- What made you choose a turnkey solution as opposed to design-bid-build?
- What about the bifuel system made you go in that direction?
- As the project moves forward, how well has it been received?

# Lourdes Noreen McKeen

## What were the previous efforts to look at standby generation?

- An existing generator on property for 20 years.
- This is a standard diesel generator that powers up only key emergency systems
- This generator would only run limited key systems in throughout all three entities at our community (IL, ALF, SNF).
- It would power up key strategic red plugs, elevators, dining, limited lighting, and life safety systems
- It would not run AC systems or other systems
- There were limited red plugs in our ALF and very limited red plugs in IL





# Lourdes Noreen McKeen

**How did Irma effect your facility and the residents? Any significant damage?**

Our community is a hurricane resistant structure. Post tension structure (Cat 5 Hurricane)

Post Hurricane Andrew building code improvements

Dedicated plant operations department

No evacuations of residences in 20 years

No significant structural damage during Irma

Utility was delayed in returning all three legs of power

This meant that post Irma we had only a 1/3 of our power restored and our existing generator attempted to compensate

The delay in returning full power was one of many factors in how we viewed complying with the governor's mandate

# Lourdes Noreen McKeen

**How much of an impact did the Governor's rule have on you versus acting on your own? Would you have done this anyway?**

Prior to the storm, investigated improving aged generator plant

In process of multiyear renovation plan - reevaluating many existing systems

Pre-Irma new emergency generator plant system was budgeted

Consistent with drive to offer a superior level of care to our residents & guests

Governor's rule moved the upgrade from "wish list" to mandated

Accelerated the internal approval and the sense of urgency

Timeline forced a review of plans to find a unique, collaborative solution

# Lourdes Noreen McKeen

## What made you choose a turnkey solution as opposed to design-bid-build?

Many factors that pushed us to pursue a turnkey solution

- Not waiting out the debate of the mandate

- Drive to be first to comply the governors order

- Desire to be THE safest place an elderly person could be during a hurricane

- Collaborative effort met the needs of short, intermediate, and long term plans

- Design and bid firms were interested only selling us their solutions.

“We want to turn the generator system into not just a part of the plant operation makeup of the facility but a marketable piece of the community. As these power regulations develop people want to know that communities will not just keep the air on or meet the bare minimum standard required by the state but, will go above and beyond for the care of their loved ones.”





# Lourdes Noreen McKeen

**What about the bifuel system made you go in that direction?**

Pre-Irma goal was a new generator plant for the entire building

To meet that need we would have to have substantial fuel storage

The governor's order guidelines made it difficult for us to meet our goal

The bifuel system helps not only meets but exceeds the governor's mandate

Future needs would be restricted if we went with straight diesel generator

Hardened natural gas line made an ideal candidate for the bifuel system

Additional protection through fuel redundancy

It helps us meet our building plans for the future at our property

This system enables us to better serve, market, and operate our facility



# External Factors – Project Delay

From mid-March until mid-May West Palm will see hundreds of thousands of visitors for these events.





# Lourdes Noreen McKeen

**As the project moves forward, how well has it been received?**

The project has been received overwhelming positive by our residents, guests, prospective residents, and the state of Florida's regulatory bodies involved in this process

It helps to differentiate ourselves from other providers who have just met the bare minimum of power requirements

Going forward there will be greater focus from the public on these systems and will see the need to provide a marketable approach to encourage corporate leadership to buy into investments beyond the standard

Facilities must look at these systems not as a merely regulatory headache but as a chance to prevent future issues during an emergency situation

Communities will be held to a higher standard and when there is another Hollywood like incident that will push forward additional regulatory requirements



An abstract graphic on the left side of the slide. It consists of a central dark purple circle connected by thin purple lines to several other circles of different sizes and colors (orange, teal, and dark purple). Some of these outer circles are also connected to each other, forming a network-like structure.

# Evaluation

Your feedback is important to us when planning future conferences. Let us know what you think!

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- Open the PDC Summit mobile app.
- Fill out and submit the evaluation form.