Memorandum

MIAMI-DADE COUNTY

Date: May 5, 2026

Agenda Item No. 2(B)(2)

To: Honorable Chairman Anthony Rodriguez
and Members, Board of County Commissioners

From: Daniella Levine Cava
Mayor

Daniella Levine Cava

Subject: Report regarding Feasibility Reports completed pursuant to the Master Services Agreement with Florida Power & Light Services, LLC – Directive No. 241760

<u>Executive Summary</u>

This report is being presented in response to Resolution No. R-1090-23 (Directive No. 241760), sponsored by Commissioner Raquel A. Regalado, and adopted as amended by the Board of County Commissioners (Board) on December 12, 2023. Pursuant to the Board's directive, completed Feasibility Study reports shall be presented to the Board detailing the results prior to project implementation. This report includes two completed Feasibility Studies for projects at Miami International Airport: Feasibility Report Solar #2, FPL Electrical Sustainability and Resiliency Miami International Airport – Dolphin and Flaming Garage Top Solar ("Feasibility Report Solar #2", attached hereto as Exhibit 1) and Feasibility Report #3 – Group 1, FPL Electrical and Sustainability Report Miami International Airport: AFL Bldg. 742, AFL Bldg. 605, Terminal H (CC H-11/H15-H1827), Park 4 Flamingo, Park 2 Consumer ("Feasibility Report #3 – Group 1", attached hereto as Exhibit 2). The costs associated with these projects and the delegated authority to enter into the agreements with FPL to implement these projects were approved by the Board by way of Resolution No. R-1090-23.

<u>Background</u>

Resolution No. R-1090-23 approved the Master Services Agreement (MSA) with Florida Power & Light (FPL) Services, LLC for a resilient infrastructure, electrical hardening, sustainability, and electric vehicle (EV) services feasibility study and implementation services thereunder through FPL under the tariff programs. The MSA is for a 20-year term with automatic renewal periods of 12 months in an amount not to exceed $912,000,000.00. The Resolution authorized the County Mayor or County Mayor's designee to execute the MSA and exercise all provisions therein, including the execution of Statements of Work (SOW) and tariff agreements with FPL for implementation of the approved projects. Section 9 of Resolution No. R-1090-23 "Directs the County Mayor or County Mayor's designee to disclose to the Board all the projects identified in the initial Feasibility Study before implementation. Thereafter, during the 20-year term of the MSA, the County Mayor or County Mayor's designee is directed to seek prior Board approval before procuring any projects arising under the MSA not identified in the initial Feasibility Study valued at $5,000,000.00 or more."

The implementation of the MSA by FPL will assist the County in the modernization of aging systems and help to make these systems more economical, resilient, and energy efficient. The work FPL will implement under the MSA includes all aspects of operating and maintaining the electrical infrastructure system at the sites identified for normal and emergency power, as well as EV charging stations.

For the purposes of expediting project delivery and not exhausting County resources, County staff and FPL collectively decided to segment the Feasibility Report and subsequent implementation projects into several packages. As the MSA includes a wide range of projects varying in size and cost, the phasing of the Feasibility Reports and connected project implementation provides for the prioritization of projects and allocation of staff time and resources over time.

Resolution No. R-1090-23 further directs the Administration to provide annual written reports to the Board throughout the term of the MSA of all work projects authorized under the MSA, which shall identify implemented projects, monies spent on such projects, and the utilization of small business participation goals on projects authorized under the MSA. Such annual reports will be submitted to the Board accordingly as forthcoming Feasibility Reports and connected work advances.

This legislative item includes two feasibility reports for projects to be constructed through the MSA: (1) Feasibility Report Solar #2 and (2) Feasibility Report #3 – Group 1.

Feasibility Report Solar #2

Feasibility Report Solar #2 is for the FPL Electrical Sustainability and Resiliency Miami International Airport – Dolphin and Flaming Garage Top Solar project. The project consists of garage-top solar canopy structures that cover parts of the upper decks of two existing parking structures. These long-term solar assets transform underutilized, single-purpose rooftop parking areas into dual-use infrastructure that produces clean energy while significantly enhancing traveler experience.

The Dolphin and Flamingo Garage Rooftop Solar project represents a meaningful opportunity for Miami-Dade County to enhance a critical airport asset in a way that delivers lasting operational and passenger value. By converting existing rooftop parking structures into dual-use infrastructure, the project maximizes the use of facilities already in place while improving the passenger experience through shaded, partially rain-protected parking.

Through the FPL SolarVantage program, the County avoids any upfront capital outlay and retains the potential to benefit from applicable federal incentives, subject to project timing, final design, and prevailing law. As a tax-exempt entity, the County may be eligible to receive the federal Investment Tax Credit as a direct pay cash payment upon the asset becoming operational. Additionally, the project is expected to offset a portion of the airport's electricity needs over time, reduce exposure to future energy cost volatility, and provide budget predictability through a fixed monthly service fee.

The solar canopies are being designed as durable, storm-hardened structures built to support the County's broader objectives and serve as a ready platform for future enhancements such as EV charging, battery storage, and other complementary applications. Taken together, the project represents an immediate infrastructure upgrade, a long-term energy cost management tool, and a forward-looking asset — purpose-built to serve the County and MIA well into the future.

The Flamingo and Dolphin garage-top solar project is expected to deliver approximately 4.3 MW (DC) of installed on-site solar capacity. Early-stage planning assumes roughly 7,300 solar panels, generating an estimated ~5.5 million kWh of renewable electricity annually. This production is projected to avoid approximately ~2,000 metric tons of CO_2 each year. These annual reductions directly support Miami-Dade County's sustainability and climate action goals by reducing MIA's net grid energy use.

This solar system will be deployed under the FPL SolarVantage regulated on-site solar tariff program. Under this program FPL designs, constructs, operates, and maintains the solar assets for a fixed term. The County pays for the solar investment via a fixed, on utility bill, monthly service payment, with no upfront capital required.

The work in Feasibility Report Solar #2 will be implemented through two Solar Power Facilities Service Agreements, Solar Power Facilities Rider (Branded as FPL SolarVantage), Solar Power Facilities Tariff Program On-Site Solar System Statement of Work – MIA Flamingo Garage Top Solar, and Solar Power Facilities Tariff Program On-Site Solar System Statement of Work – MIA Dolphin Garage Top Solar.

The monthly service payments for the Dolphin and Flamingo Garage Top Solar over a 20-year term is between $210,000 - $290,000. The Administration is additionally pursuing Investment Tax Credit (ITC) through the Treasury Department's elective pay program. FPL estimates that the direct-pay ITC amount will be approximately $8,000,000 - $13,000,000 paid to the County.

<u>Feasibility Report #3 – Group 1</u>

The document attached as Exhibit 2 is Feasibility Report #3 – Group 1, for the FPL Electrical and Sustainability Report Miami International Airport: AFL Bldg. 742, AFL Bldg. 605, Terminal H (CC H-11/H15-H1827), Park 4 Flamingo, Park 2 Consumer project.

This project will replace and upgrade end-of-life emergency generator, diesel storage, 480V switchgear, and other necessary electrical equipment at Airfield Lighting Building 742, Airfield Lighting Building 605, Terminal H (CC H-11/H15 – H1827), Park 4 Flamingo Parking Garage, and Park 2 Consumer.

The core objective of the feasibility report for electrical resiliency and sustainability is to evaluate the electrical distribution system at MIA to identify electrical risks that could impact operations, identify gaps in electrical resilience, and develop electrical infrastructure solutions that increase overall resiliency and sustainability in-line with Miami-Dade County's environmental objectives. This Feasibility Report groups five (5) separate locations together. Necessary scope combined from these locations total seven generator replacements, nine switchgear units, five diesel system replacements, and other electrical device replacements. This report is for a Maintenance Project for legally required backup generation systems at AFL Building 742, AFL Building 605, Terminal H (CC H-11/H15-H1827), Park 4 Flamingo, and Park 2 Consumer. These spaces are prioritized due to aging condition of the existing electrical equipment and generator, obsolete end-of-life switchgear, and highly critical functions served by these locations – such as lighting significant portions of the airport runways, terminals, parking garages, and other passenger-oriented services.

The work in Feasibility Report #3 will be implemented through the Non-Residential Optional Power Supplemental Power Services (OSPS) Agreement, Supplemental Power Services Rider Pilot, and the Non-Residential Optional Supplemental Power Services Tariff Program SOW. These agreements are available upon request.

The monthly service payments for each project are in the following ranges over the 20-year term of the OSPS Tariff Program:

- AFL 742: $29,176 - $38,901
- AFL Building 605: $85,700 - $114,267
- Terminal H: $142,751 – $190,334
- Park 4 Flamingo Parking Garage: $60,476 - $80,634
- Park 2 Consumer: $88,157-$117,542

Conclusion

The SOW connected with the attached Feasibility Reports are available upon request. Resolution No. R-1090-23 also directs the County Mayor or County Mayor's designee to provide regular written reports to the Board throughout the term of the MSA of all work projects authorized under the MSA, including identification of implemented projects, along with monies spent. The first annual report describing status of MSA projects initiated to date has been submitted separately as a report to the Board.

Pursuant to rule 4.01(v) of the Board's Rules of Procedure, this report will be placed on the next available IITC meeting agenda and the next available Board of County Commissioner's meeting agenda. Pursuant to Resolution No. R-1090-23 Feasibility Reports conducted pursuant to the MSA will be reported to the IITC and Board as such Feasibility Reports become available for disclosure to the Board prior to implementation. Should you require additional information, please contact Loren Parra, Director and Chief Resilience Officer, Department of Environmental Resources Management, loren.parra@miamidade.gov, or Ralph Cutie, Director & CEO, Miami-Dade Aviation Department, rcutie@flymia.com.

Attachments

Exhibit 1 - Feasibility Report Solar #2
Exhibit 2 - Feasibility Report #3 – Group 1

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Exhibit 1

Feasibility Report Solar #2

FPL Electrical Sustainability and Resiliency
Miami International Airport – Dolphin and Flamingo
Garage Top Solar

January 15, 2025

Prepared by: Marshall Nelson, PMP

FPL Services

Contents

Executive Summary

In accordance with the Master Services Agreement "MSA" - Master Agreement for Energy Related Products and Services by and between FPL Services, LLC (FPLS) and Miami-Dade County (MDC) entered on January 24, 2024 and a Feasibility Study Authorization form dated February 14, 2024, this is the second solar feasibility study for Electric Energy Sustainment and Resiliency conducted at Miami International Airport (MIA).

This feasibility study establishes the project plan for a large-scale, on-site solar photovoltaic (PV) system to be installed on the top levels of the Flamingo and Dolphin parking garages at MIA. The project consists of garage-top solar canopy structures that cover parts of the upper decks of two existing parking structures. These long-term solar assets transform underutilized, single-purpose rooftop parking areas into dual-use infrastructure that produces clean energy while significantly enhancing traveler experience.

The Flamingo and Dolphin garage-top solar project is expected to deliver approximately 4.3 MW (DC) of installed on-site solar capacity. Early-stage planning assumes roughly 7,300 solar panels, generating an estimated ~5.5 million kWh of renewable electricity annually. This production is projected to avoid approximately ~2,000 metric tons of CO_2 each year. These annual reductions directly support Miami-Dade County's sustainability and climate action goals by reducing MIA's net grid energy use. The project also increases visible, on-site renewable generation at one of the County's most prominent public facilities.

This solar system will be deployed under the FPL SolarVantage regulated on-site solar tariff program. Under this program FPL designs, constructs, operates, and maintains the solar assets for a fixed term. MIA pays for the solar investment via a fixed, on utility bill monthly service payment, with no upfront capital required.

Key benefits of the Flamingo & Dolphin Garage Top Solar project include:

- **Visible commitment to sustainability:**
    - A large, highly visible solar installation on prominent airport parking structures, reinforcing MDC's climate and sustainability commitments to residents, visitors, and business partners.
    - A clear, physical demonstration of MDC's investment in renewable solar energy at one of the most recognizable public facilities in the county.
- **Visible solar to passengers and the public:**
    - Solar arrays will be clearly visible from terminal windows, roadways approaching the airport, on-site lodging, and arriving and departing aircraft.
    - The system provides a powerful, easy-to-understand visual cue of MIA's commitment to sustainability goals and innovation.
- **Enhanced passenger experience through shaded parking:**

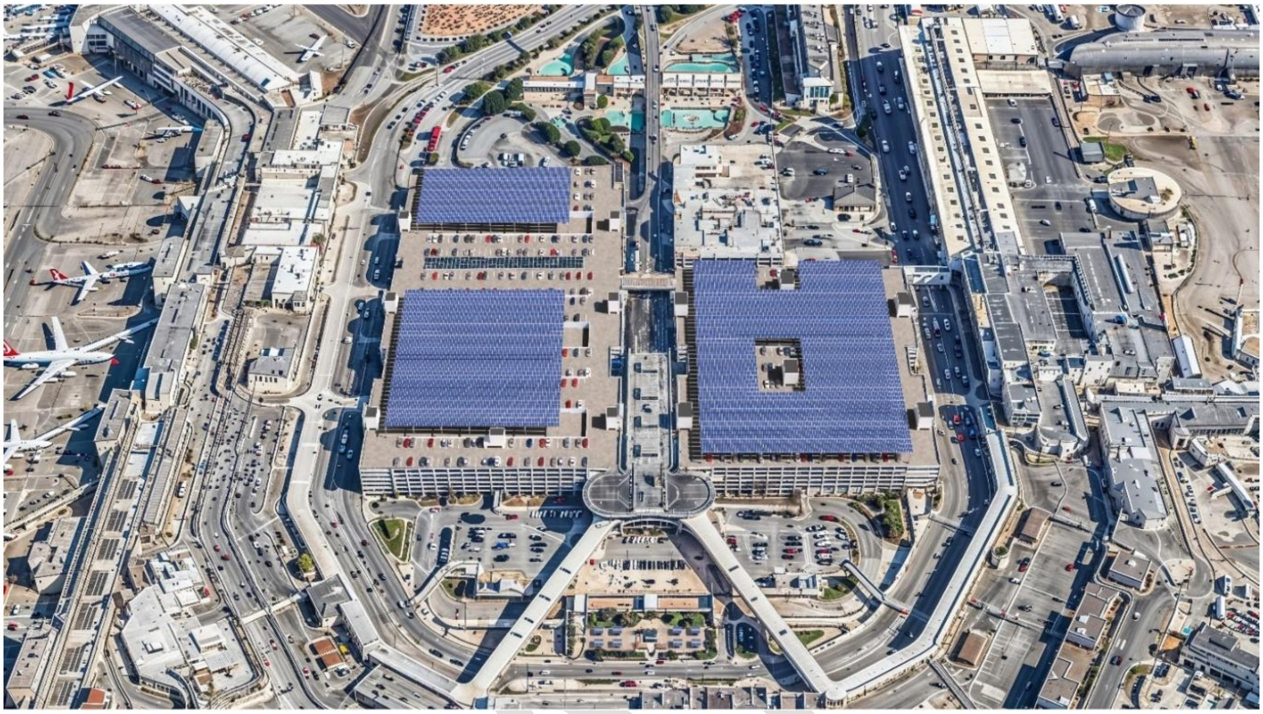
  - Covering over 800 parking spaces, the solar canopy structures will provide shade and partial rain protection for vehicles on the top levels of the Flamingo and Dolphin garages.
  - Shaded parking improves thermal comfort for passengers, reduces heat buildup inside vehicles, and enhances the quality of airport facilities.

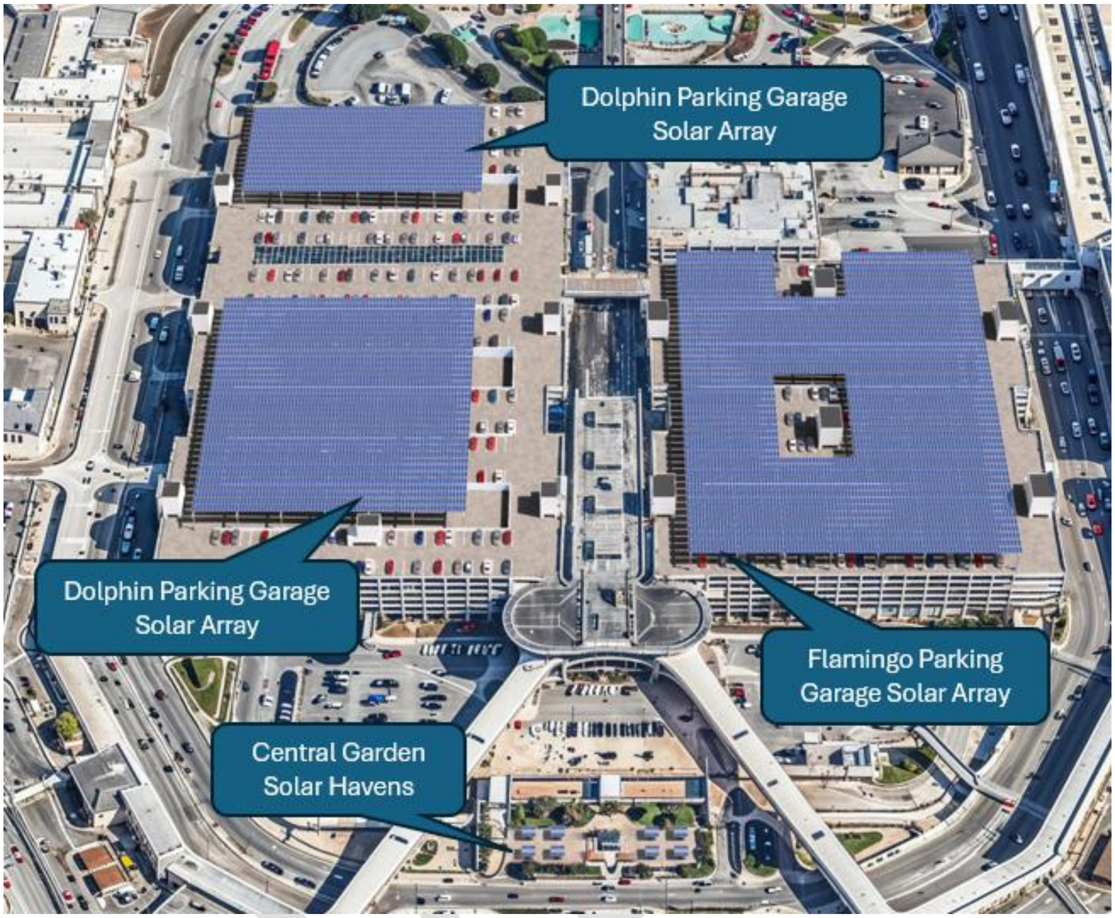
- **Conversion of single-use space into dual-use infrastructure:**
  - Existing rooftop parking decks currently serve only as vehicle storage.
  - With solar canopies, these decks become **dual-use spaces** that both:
    - generate on-site renewable electricity, directly reducing MIA's grid energy usage, and
    - serve as a high-value passenger amenity (covered parking).
  - This project exemplifies efficient use of constrained airport real estate and aligns with MDC's broader goals around sustainability, value optimization, and creating a best-in-class traveler experience.
- **Energy, environmental, and economic benefits:**
  - The system will reduce MIA's net grid energy consumption and greenhouse gas emissions, supporting the County's ambitious climate objectives.
  - MDC, as a non-tax-paying entity, may be eligible to receive certain federal incentives (e.g., investment tax credits) associated with the project, consistent with current legislation. Given MDC's tax status, these incentives are expected to be received as a direct pay, lump sum cash amount.
- **Enduring, sustainability landmark:**
  - As a permanent, easily recognizable feature of the MIA campus, the garage-top solar canopies will remain a recognizable symbol of the County's commitment to on-site renewable energy production for years to come.
  - The project will stand alongside other signature infrastructure investments as a long-lived example of proactive climate and resiliency leadership for future residents, staff, and travelers.

In addition to the aforementioned key benefits, it is important to consider that this solar asset will be located in an area that is subject to extreme weather events and will need to be constructed and maintained with safety as a primary priority. As with all FPL SolarVantage projects, The Dolphin and Flamingo Garage Top Solar system will be engineered as **storm hardened infrastructure** designed to meet Miami-Dade County High Velocity Hurricane Zone (HVHZ) wind and storm requirements.

Similar long-span solar structures have already been successfully deployed at major airports such as **Honolulu, Newark, and Tampa, demonstrating that this is a proven, aviation-compatible solution.** Further details about these comparable sites are included in a later section of this report. Additionally, conceptual layouts and renderings illustrating the look and feel of the proposed garage-top solar canopy system for the Flamingo and Dolphin garages are included in the report.

The Flamingo & Dolphin Garage Top Solar project builds upon the initial Central Garden Solar Haven deployment at MIA, scaling from a high-visibility, messaging based amenity to a substantial, commercial-grade solar asset integrated into MIA's core infrastructure. Over its multi-decade life, the garage-top solar installation will stand as a prominent, long-lasting manifestation of Miami-Dade County's commitment to renewable energy and climate resilience at one of its most important public facilities. With the addition of the Dolphin & Flamingo Garage Top solar project, **MIA will become one of the leading airports in the nation** for visible, on-site solar, converting existing parking decks into dual-use, future-ready infrastructure. Investment in this new infrastructure directly supports renewable energy production, achievement of County sustainability goals, and provides immediate enhancement of traveler experience.





Dolphin Parking Garage Solar Array
Dolphin Parking Garage Solar Array
Flamingo Parking Garage Solar Array
Central Garden Solar Havens

Organizational Capabilities.

FPL is well-positioned to support Miami-Dade County's investments in electrical infrastructure that is both hardened for adverse weather events and environmentally sustainable.

The company is an industry leader in resilient and sustainable electrical infrastructure and on-site solar asset deployment since introducing the FPL OSPS program in 2019 and the FPL SolarVantage program 2021, delivering large backup power solutions and on-site solar to major institutions throughout the state.

FPL, along with its parent company NextEra Energy, is the world's largest owner and operator of solar generation systems. Additionally, FPL owns and operates several utility scale battery storage systems throughout the state. The lessons learned from past projects are included in how FPL develops solutions for MIA for energy sustainability and reduction in environmental impact.

FPL looks forward to being your long-term partner in Florida. FPL has extensive experience in deploying resilient electrical infrastructure solutions and on-site solar systems, both designed to meet our customers' needs, and we are happy to serve as an advisor as you navigate this process, leveraging our experience deploying robust, reliable electric infrastructure around the state.

Together, as two of Florida's largest organizations, we can help meet a growing need for resilient electrical infrastructure and on-site solar, and position MIA for continued economic prosperity.

Evaluation Methodology

The evaluation for the Flamingo and Dolphin Garage Top Solar project focuses on:

1. **Technical feasibility** of installing solar canopy structures on the top levels of the existing parking garages.
2. **Operational feasibility** given MIA's high-traffic environment, constrained construction windows, and airport security and safety requirements.
3. **Aesthetic and passenger-experience enhancements** related to solar visibility, shaded parking, and increased amenity value.
4. **Integration with MDC's sustainability and resiliency goals** and alignment with the existing MSA and FPL SolarVantage tariff structure.

The evaluation process included:

- Site walks and preliminary observations of the Flamingo and Dolphin garages, with focus on top-deck layouts, traffic patterns, structural conditions, drainage, and existing lighting.
- Preliminary structural and electrical feasibility review at a planning level to confirm that the concept is suitable for advancement into detailed engineering.
- Review of conceptual garage-top solar layouts and renderings that illustrate long-span solar canopies with consistent architectural language across both garages.

- Consideration of airport operational constraints, including passenger flows, circulation patterns, security zones, and access for construction equipment.

The overall goal of this project is to implement a large, visible on-site solar solution that meaningfully improves MIA's sustainability profile and passenger experience while maintaining safe, reliable airport operations.

Existing State Evaluation

The Flamingo and Dolphin parking garages are among MIA's primary passenger parking assets. The top levels of these garages currently:

- Offer **no shade** or rain protection for vehicles or passengers.
- Experience **high surface temperatures** due to direct sun exposure, contributing to uncomfortable vehicle cabin temperatures and reduced passenger satisfaction.
- Provide **no energy production** or other functional benefit to MIA beyond parking.

From a visual standpoint, the top decks are largely unutilized airspace, with minimal architectural features. However, their **size, elevation, and proximity to terminals and approach roads** make them ideal for a highly visible solar installation.

The existing state therefore represents:

- A missed opportunity to **convert underutilized horizontal space into productive renewable energy infrastructure**, and
- A gap in **passenger amenities** relative to leading airports that offer covered parking, sustainability features, or both.

By deploying garage-top solar canopies on these decks, MIA can transform the Flamingo and Dolphin garages into signature sustainability assets that simultaneously deliver:

- On-site renewable energy generation, which directly offsets a portion of MIA's grid procured electricity
- Enhanced guest experience and comfort
- A strong visual statement of MDC's climate and resiliency leadership and measurable progress on the County's climate goals

System Design Considerations: Wind and Storm Resiliency

The Flamingo & Dolphin Garage Top Solar system will be engineered from the outset as **storm-hardened, aviation- and commercial-grade infrastructure** designed to perform in Miami-Dade County's High Velocity Hurricane Zone (HVHZ). The long-span canopy structures, foundations, and attachments will be designed in accordance with the latest Florida Building Code and ASCE 7 wind-load provisions for rooftop solar and attached canopies.

In parallel, FPL will coordinate with the Miami-Dade Aviation Department and applicable federal and local authorities to ensure all aviation safety requirements are met, including completion of any required analyses (i.e. glint, glare studies). As part of detailed design, FPL will evaluate panel placement, tilt, and reflectivity to confirm that the garage-top solar system does not adversely affect pilots, air traffic controllers, or airfield operations, and will submit all required aviation studies for review and approval prior to construction.

Key engineering activities and design features anticipated for the garage-top solar installation include:

- **Code-driven wind design:** Canopy structures, connections, and PV racking will be engineered to meet or exceed current Miami-Dade and Florida Building Code requirements for wind, uplift, and lateral loads applicable to open parking structures in the HVHZ.
- **Robust structural system:** Long-span steel or aluminum canopy frames will utilize conservative member sizing, bracing, and connection details to control deflection, reduce fatigue, and maintain adequate clearances under extreme wind events.
- **Engineered foundations and attachments:** Column bases and roof/deck attachment systems will be designed to resist code-required uplift forces while protecting garage waterproofing and structural integrity.
- **Hurricane-aware layout:** Module orientation, array spacing, and canopy geometry will be configured to reduce adverse aerodynamics (e.g., edge uplift “hot spots”) in line with current ASCE 7 guidance on rooftop solar arrays.
- **Aviation-aware solar design:** Canopy layout and module characteristics will be developed in coordination with airport and regulatory requirements, including glint and glare considerations, to ensure compatibility with airfield sightlines and aviation operations.
- **Corrosion resistance in a coastal environment:** Materials and coatings will be selected for high durability in Miami’s salt-air conditions (e.g., hot-dip galvanizing, marine-grade fasteners), reducing lifecycle maintenance needs and preserving structural performance.
- **Rapid post-storm inspection and restoration:** The design will facilitate safe inspection access and modular replacement of components so the system can be evaluated and returned to service quickly if impacted by major storm event.

Together, these design measures position the garage-top solar system not simply as an energy project, but as a **long-lived renewable generation asset** integrated into one of the airport’s most visible public structures.

Benchmark Examples at Other Aviation Facilities

The Dolphin and Flamingo Garage Top Solar project places Miami International Airport in a peer group with leading airports that have already deployed long-span solar structures on parking garages and other aviation facilities:

- **Daniel K. Inouye International Airport (Honolulu, HI):**
  - The Hawaii Department of Transportation has installed extensive solar across Honolulu's airport campus. An example of this includes a large solar canopy atop the Terminal 2 parking structure that holds nearly **3,000 panels**, providing shaded parking for vehicles and operating in a coastal, high-wind environment.
  - Across terminal roofs and parking structures, the airport has deployed more than **5.3 MW** of additional PV capacity, with garage canopies accounting for approximately **3.4 MW** of that total.
  - These projects demonstrate that large-scale, garage-top solar can be safely and reliably integrated into a busy international airport subject to tropical storms, strong trade winds, and salt-air exposure.

- **Newark Liberty International Airport (Newark, NJ):**
  - At Newark's newly built Terminal A, the Port Authority of New York and New Jersey has installed a **5 MW solar canopy** on the terminal's parking garage. Covering over **360,000 square feet** and using over 12,000 solar panels, this asset is one of the largest garage top solar arrays ever built.
  - The installation is a high-visibility example of a large, structurally robust garage top solar canopy system operating in a dense, aviation-critical environment and designed to meet Northeast winter weather and coastal storm conditions.

- **Tampa International Airport (Tampa, FL):**
  - Tampa Electric (TECO) and Tampa International Airport jointly deployed a **2 MW** solar array atop the South Economy Parking Garage. This garage top solar asset covers roughly **175,000 square feet** and provides partial shaded parking to top deck of the parking structure. This asset is the largest solar array in the Tampa Bay region consisting of ~6,200 solar panels.

- This demonstrates the feasibility and value of garage-top solar in Florida's regulatory and climatic context, further strengthening the feasibility of garage top solar at MIA.

These benchmark projects underscore that **long-span, garage-top solar structures are a proven, airport-compatible solution** when designed to appropriate structural and wind-load standards. The Flamingo and Dolphin Garage Top Solar system is expected to follow and advance these best practices in a High Velocity Hurricane Zone setting.

When combined with the existing on-site solar investments already underway at MIA, the Flamingo & Dolphin Garage Top Solar project will position Miami International Airport as **one of Florida's leading airports for visible, on-site renewable energy.**

- Within Florida, only a limited number of airports have implemented garage-top solar arrays to date, most notably Tampa International's South Economy Garage project.
- By deploying a larger, visually prominent garage-top system on **two major parking structures**, paired with previously approved on-site solar at Central Garden, MIA is poised to become the **benchmark Florida hub** for integrating solar into core passenger facilities rather than relying solely on grid electricity.

This leadership has several strategic advantages for Miami-Dade County and MIA:

- **Future-ready infrastructure:** A storm-hardened, garage-top solar system creates a platform for future integration of **battery storage, EV charging, and potential microgrid and islanding applications**, supporting long-term resiliency and operational flexibility as technology and regulatory frameworks evolve.
- **Climate and policy alignment:** The project enables MIA to be a leader within the County by achieving **measurable progress** on the County's robust climate and sustainability goals and commitments.

- **Reputation and competitive differentiation:** Visible, hurricane-hardened solar canopies on the Flamingo and Dolphin garages will send a clear message to passengers, airlines, and business partners that Miami-Dade County is **investing in resilient, forward-looking infrastructure** at one of its most important economic engines.

Operational and Construction Evaluation

The Flamingo and Dolphin garages are critical to airport operations and must remain as functional as possible throughout construction. Construction and operations considerations include:

- **Location & Access**
  - Both garages are accessible from existing roadways and internal circulation routes.
  - Construction staging, crane operations, and materials delivery will be planned to minimize impacts to active parking levels and traffic flows.
- **Phasing & Parking Availability**
  - Construction will be phased to maintain adequate parking capacity during peak periods.
  - Work can be scheduled by garage or by sectioned zones to limit simultaneous disruptions.
  - Temporary closures of selected top-deck parking bays will be required for safety while canopy structures are erected.
- **Airport Operations & Coordination**
  - Coordination with MDAD operations, airport security, and parking management is essential to align construction activities with flight schedules and passenger peaks.
  - Work windows may be preferentially scheduled during off-peak travel periods and overnight hours, where practical.
- **Construction Methods**
  - Garage-top solar will primarily leverage field-assembled steel or aluminum canopy structures anchored to the existing deck, with careful consideration of structural capacity, waterproofing, and drainage.

- Overhead work will be performed in accordance with all airport safety and fall-protection standards.
- Electrical work will involve routing conductors in protected raceways, installing inverters and combiner equipment (location to be confirmed in detailed design), and interconnecting to the airport's existing distribution system.

In addition to standard constructability considerations, the Flamingo and Dolphin garage-top canopies will be designed and constructed as hardened structures consistent with Miami-Dade's HVHZ requirements, including appropriate wind-load, uplift, and corrosion provisions. Structural systems, foundations, and attachment details will be selected to perform reliably under severe storm conditions while maintaining safe, efficient parking operations during and after construction. This approach ensures the garage-top solar system functions not only as an energy asset, but also as a long-lived, storm-resilient component of the airport's critical infrastructure.

With careful planning, the Flamingo and Dolphin Garage Top Solar system can be constructed with limited operational impact, comparable to other major capital projects already routinely executed at MIA.

CIP Considerations

The Capital Improvement Plan for MIA has been considered to ensure this project does not conflict with other planned work at MIA.

The Capital Improvement Plan (CIP) for MIA was considered at a planning level to ensure that garage-top solar deployment:

- Does not conflict with known near-term structural modifications or planned demolitions of the Flamingo or Dolphin garages.
- Remains compatible with potential future investments, such as:
    - Electric vehicle (EV) charging infrastructure.
    - Additional resiliency, battery, or microgrid solutions.
    - Wayfinding, lighting, or security upgrades in the garages.

The garage-top solar structures are being planned as **long-lived, complementary infrastructure** that can support future CIP initiatives rather than compete with them.

Project Plan – Dolphin and Flamingo Garage Top Solar

Project Description

The project consists of deployment of an on-site solar photovoltaic system installed as elevated canopy structures on the top levels of the Flamingo and Dolphin parking garages at MIA.

At a conceptual level, the system includes:

- Long-span solar canopies covering substantial portions of the upper decks, providing shaded parking while maximizing solar energy production.
- Canopy arrangements aligned with existing parking bays and drive aisles, designed to maintain or improve traffic flow and safety.
- A consistent architectural theme across both garages, reflecting the conceptual layouts and renderings prepared under the FPL SolarVantage Garage Top Solar concept.

The proposed solar canopy system will:

- Generate on-site renewable electricity for MIA, offsetting a portion of the airport's electrical load.
- Provide shaded parking and improved comfort for passengers and employees.
- Create a prominent, highly visible sustainability feature that reinforces MDC's environmental leadership.

By installing hurricane-rated solar canopies on the top levels of the Flamingo and Dolphin garages, the project converts existing rooftop parking decks into a **dual-use, traveler-centric parking amenity and renewable energy asset**. The canopies will provide shaded, partially rain-protected parking for passengers while producing on-site renewable electricity in a form that is easily visible from terminals, approach roads, and aircraft. Over time, the hardened canopy structures can also serve as a physical platform for future technologies such as integrated EV charging, battery storage, or microgrid applications, further enhancing the resiliency and value of the airport campus.

Permit Applications and Inspections

FPL will obtain all permits and approvals required for installation and operation of the Flamingo and Dolphin Garage Top Solar system, which are expected to include:

- Miami-Dade County Building permits (structural, electrical, and any roofing/deck related permits as applicable).
- Airport-related permits, approvals, and clearances as required by MDAD (e.g. glint / glare study, safety, operations, and security).

- Any required inspections and approvals by the Authority Having Jurisdiction (AHJ), which may include intermediate inspections for foundations, structural components, and electrical installations.

All solar canopy structures and associated electrical systems will be permitted in accordance with applicable Miami-Dade County code requirements and airport standards.

Asset Capacity and Expected Energy Production

The capacity of the Flamingo & Dolphin Garage Top Solar installation is estimated to be ~**4.3 MWdc / 3.0 MWac.** The initial asset design and layout includes over **7,300 solar panels** installed on long-span canopy structures over the top levels of the two garages. The exact system size will be determined after final engineering and system design activities are completed.

At this scale, and under typical Miami weather conditions, the system is expected to produce approximately **5.5 to 6.0 million kilowatt-hours (kWh) of electricity annually**. This is a planning-level range that will be further refined through detailed energy modeling and analysis, but it illustrates the material impact the project can have on offsetting MIA's grid energy consumption.

Annual energy production will be driven by several key factors, including:

- The strong solar resource in South Florida and the favorable elevation and exposure of the garage-top canopies.
- The orientation, tilt, and spacing of the panels to capture high mid-day production while managing shading constraints.
- System availability, including the reliability of inverters and electrical equipment, and the effectiveness of ongoing operations and maintenance.

Under the FPL SolarVantage program structure, **FPL provides all ongoing maintenance, monitoring, and repair** for the solar asset over the term of the agreement, helping to sustain energy production and protect the long-term value of the system.

For airport and county leadership, this means the airport gains a large, predictable stream of on-site renewable energy, producing several million kWh per year, without taking on construction risk or operations and maintenance (O&M) responsibility. Additionally, because the canopies are designed as long-lived infrastructure, the benefits of this project: renewable energy production, shaded parking, and a visible statement of the County's values will continue to be realized year after year, creating enduring value well beyond the initial service term.

Carbon Reduction and Sustainability Benefits

Air travel is among the **most carbon-intensive activities** in the transportation sector, and as a major global hub, Miami International Airport is a significant source of associated emissions, making targeted reductions in airport operations both a responsibility and a high-impact opportunity. While this project does not change aircraft fuel use, it does reduce the emissions associated with running MIA's facilities by replacing a portion of grid electricity with on-site, renewable solar generation. This supports Miami-Dade County's broader climate and resiliency objectives, and the sustainability framework established under the Master Services Agreement (MSA) between FPL and Miami-Dade County.

Estimated CO_2 Reductions from Garage-Top Solar

For planning purposes and based on high-level system layout and capacity, the Flamingo & Dolphin Garage Top Solar system is expected to produce approximately **5,500,000 to 6,000,000 kilowatt-hours (kWh) of electricity per year**. To estimate the greenhouse gas impact, a representative average grid emissions factor for Florida of about 0.36 kilograms of CO_2 per kWh is applied to this generation, based on EPA eGRID data for the Florida (FRCC) subregion. (epa.gov)

Using this factor, the **annual CO_2 reduction** from the garage-top solar system is:

- Low estimate:
  - 5,500,000 kWh × 0.36 kg CO_2/kWh ≈ **1,980,000 kg CO_2**, or about **2,000 metric tons of CO_2 per year** (rounded).
- High estimate:
  - 6,000,000 kWh × 0.36 kg CO_2/kWh ≈ **2,160,000 kg CO_2**, or about **2,200 metric tons of CO_2 per year** (rounded).

In round numbers, the Flamingo & Dolphin Garage Top Solar project is expected to **avoid on the order of 2,000–2,200 metric tons of CO_2 annually**, compared to sourcing the same electricity from the grid.

These calculations are **intentionally conservative** given the early-stage nature of this project. These calculations use an average emissions factor for the Florida grid rather than higher "marginal" or "avoided" factors that would result in a larger CO_2 benefit. Calculations are also based on the current high-level layout, system sizing, and generation assumptions for the 4.3 MWdc design. As detailed engineering, shading analysis, and performance modeling are completed, FPL will refine the annual generation and associated emissions estimates and impacts.

GHG Emissions Impact and Alignment with County's Climate Goals

Miami-Dade County has formally committed to ambitious climate objectives through its **Climate Action Strategy** and related plans, including:

- Achieving **net-zero emissions by 2050**
- Achieving a **50% reduction in greenhouse gas (GHG) emissions by 2030**, from recent baseline levels, including a specific target to **reduce GHG emissions from airport operations by 50% by 2030**.

- Expanding on-site and off-site solar deployment on County facilities, including a goal to have **30% of county-wide energy from solar by 2030**.

Within that context, the Flamingo & Dolphin Garage Top Solar system:

- **Directly assists in achieving near term and longer-term** emissions goals for both the county and aviation facilities
- Directly **reduces MIA's carbon footprint** as it pursues the 50% airport-emissions reduction target.
- Represents a **large contribution** toward the County's on-site solar goals, supplying several million kWh of renewable energy and corresponding GHG reduction per year from **a highly visible County asset.**

In accordance with the Master Services Agreement and the associated FPL SolarVantage tariff program documents, Miami-Dade County is entitled to **100% of the environmental attributes** (including renewable energy certificates) generated by on-site solar systems. FPL will, unless instructed otherwise, retire the RECs on the County's behalf, enabling Miami-Dade to count the avoided emissions from this project directly toward its climate and sustainability commitments.

Because air travel is carbon intensive by nature, every credible reduction in MIA-controlled emissions is important and represents real progress in achieving the County's ambitious goals. The Flamingo & Dolphin Garage Top Solar project:

- Provides a **measurable, auditable annual CO_2 reduction** in the range of 2,000–2,200 metric tons.
- This reduction is achieved in a way that is **visually prominent** to passengers, airlines, and staff, and the community at large.
- Fits squarely within the County's Climate Action Strategy and the MSA structure, ensuring that the **environmental value created on-site at MIA directly assists** Miami-Dade County's overall greenhouse gas reduction goals.

In summary, while air travel will remain emissions-intensive for the foreseeable future, the Dolphin & Flamingo Garage Top Solar project enables MIA to **directly and measurably lower the carbon footprint of MIA.** Further, the project provides a **material, trackable contribution** to the County's long-term climate strategy delivered through a turnkey FPL program that includes all asset planning and construction as well as ongoing maintenance, monitoring, and emissions reporting support.

Financial Feasibility

The FPL SolarVantage Monthly Service Payment for solar on the Dolphin and Flamingo Garage Tops is estimated based on pre-survey design and prior to equipment purchase and installation. As stated in the Statement of Work (SOW), actual costs are estimated as a range for rough-order-of-magnitude planning and approval.

Actual project cost will be based on 100% approved design and competitive bidding, based on concept developed in this feasibility report. The monthly service payment is for 20 years, fixed, and includes all procurement, construction, testing, commissioning and both preventive and reactive maintenance. The monthly payment goes on the utility bill for the above stated account (as a separate line item) and begins after the system is fully commissioned and operational, helping MDC delay capital expenditures.

FPL SolarVantage Monthly Service Payment

Dolphin and Flamingo Garage Top Solar	20-Year, Fixed Monthly Service Payment
High Estimate	$290,000
Low Estimate	$210,000

The primary driver for the high range is uncertainties is related to project complexity and permitting / engineering costs (if determined applicable).

Under the FPL SolarVantage tariff program:

- **MDC is not required to make an upfront capital investment**; instead, FPL finances the project and recovers costs through a fixed monthly SolarVantage service payment over a 20-year term.
- The monthly payment:
  - Is determined based on actual cost once engineering is complete and construction is competitively bid.
  - Appears as a separate line item on the applicable FPL electric utility bill(s).
  - Includes all ongoing O&M costs, monitoring, and repair obligations during the term.

Planning-Level Considerations:

- The garage-top system is expected to produce a substantial amount of on-site renewable electricity annually, reducing MIA's net grid consumption and exposure to long-term energy price volatility.
- As a tax-exempt entity, MDC may be eligible to claim federal investment tax credits (ITC) via direct pay, subject to current IRS guidance and applicable law, improving the project's overall economics.
- Because SolarVantage converts a large upfront capital expenditure into a predictable operating expense, the program can help MDC preserve capital budget capacity for other critical projects in the MIA CIP.

Investment Tax Credit (ITC) and Direct Pay Benefit to the County

Subject to prevailing federal law and final project timing, the proposed solar project is forecasted to qualify for the federal **Investment Tax Credit (ITC),** which the County may be eligible to claim. Because Miami-Dade County is a non–tax paying entity, this credit is anticipated to be received as a **lump-sum "direct pay" cash payment** to the County rather than as a traditional tax offset. This direct pay credit can usually be claimed after the solar asset becomes commercially operational.

In practical terms, this means a significant portion of the project cost will be offset by the cash incentive, reducing the overall cost to the County. Under the FPL SolarVantage tariff program, the **full value of the direct pay ITC is claimed by the County**. These direct-pay ITC funds can then be used at the County's discretion, including to help offset the net budget impact of the SolarVantage Monthly Service Payment or to **reinvest in other key priorities** such as resiliency, capital improvements, or additional sustainability initiatives.

This direct-pay ITC feature is a **major value driver** of the Dolphin & Flamingo Garage Top Solar project, turning a high-visibility renewable energy investment at MIA into an opportunity to bring substantial cash funding to the County shortly after asset construction is complete.

The exact incentive amount will be determined after final engineering, system design and construction have been completed. Based on the current high-level design of the Flamingo & Dolphin Garage Top Solar project the **direct-pay ITC amount is estimated to be ~$8,000,000 to $13,000,000**

Conclusion and Recommendations

The Dolphin and Flamingo Garage Top Solar project represents a logical and impactful next step in MIA's on-site solar and sustainability journey, building on the initial Central Garden Solar Haven deployment and scaling up to a highly visible, large-scale system.

Key outcomes of the project include:

- A **visible, signature solar installation** at one of MDC's most important public facilities.
- **Enhanced passenger experience** through shaded, partially rain-protected parking and improved perceived quality of airport amenities.
- **Conversion of single-use parking deck space into dual-use, commercial-grade infrastructure**, simultaneously providing clean energy and guest amenity.
- **Alignment with MDC climate, resiliency, and sustainability goals**, while leveraging federal incentives before they are reduced and eliminated.
- A **no-upfront-capital pathway** for MDC via the FPL SolarVantage tariff program, featuring a convenient and predictable **fixed monthly payment over a fixed term**, inclusive of all construction and comprehensive O&M support.

FPL recommends that Miami-Dade County Commissioners authorize advancement of the Dolphin and Flamingo Garage Top Solar project under the FPL SolarVantage program. Recommend next steps include:

1. Execution of the Solar Power Facilities Service Agreement and associated Statement of Work for the garage-top solar system.
2. Competitive procurement, detailed engineering, permitting, and interconnection studies in coordination with MDAD and relevant agencies.
3. Robust construction planning for phased deployment on the Flamingo and Dolphin garages to maintain safe, reliable airport operations throughout construction.

Upon agreement approval and execution, FPL is prepared to support MDC and MDAD through design, permitting, construction, and long-term O&M to deliver a flagship solar project that:

- Demonstrates a visible, hurricane-hardened commitment to environmental stewardship and renewable energy at one of the County's most important public assets,
- Enhances the travel experience for millions of passengers each year by providing shaded, high-quality parking and a clearly recognizable renewable-energy presence at the airport, and
- Sets a precedent for innovative dual-use infrastructure that maximizes the value of existing facilities across Miami-Dade County.

Comparable garage-top solar installations at Honolulu, Newark, and Tampa airports show that long-span, structurally robust solar canopies are a proven, aviation-compatible solution. By advancing the Flamingo and Dolphin Garage Top Solar project, Miami-Dade County will position Miami International Airport as a statewide leader in dual-use, on-site solar, with expected annual generation of approximately **5.5–6.0 million kWh** of on-site renewable electricity, an estimated **2,000–2,200 metric tons of CO_2 reductions each year**, and clear alignment with the County's ambitious climate and greenhouse gas reduction goals. This project will also greatly enhance the day-to-day passenger experience and firmly establish MIA's long-term role as a modern, amenity-rich, low-carbon global gateway.

In addition to its financial, operational, and environmental benefits, the Flamingo & Dolphin Garage Top Solar project offers Miami-Dade County the opportunity to establish a **signature renewable generation asset** at MIA, one that will frame the airport experience for millions of travelers as they arrive and depart the facility. Easily recognizable from terminals, roadways, and aircraft, the garage-top solar canopies will stand for decades as a clear signal of how Miami-Dade invests in its future and will provide a project that future leaders can point to as a defining example of proactive and strategic investment in renewable, storm-hardened infrastructure.

FPL Services™

Feasibility Report #3 – Group 1

FPL Electrical Sustainability and Resiliency
Miami International Airport

AFL Bldg. 742
AFL Bldg. 605
Terminal H (CC H-11/H15 – H1827)
Park 4 Flamingo
Park 2 Consumer

September 22, 2025

Written by: Jon McQuitty

Contents

Executive Summary

In accordance with the Master Services Agreement "MSA" - Master Agreement for Energy Related Products and Services by and between FPL Services, LLC (FPLS) and Miami-Dade County (MDC) entered on January 24, 2024 and a Feasibility Study Authorization form dated February 14, 2024, this is the third feasibility study for Electric Energy Sustainment and Resiliency conducted at Miami International Airport (MIA), and encompasses five separate locations.

This is the third feasibility report for MIA by FPLS, as it prioritizes the needs of Miami-Dade Aviation Department (MDAD), to replace and upgrade end-of-life emergency generator, diesel storage, 480V switchgear, and other necessary electrical equipment at Airfield Lighting Building 742, Airfield Lighting Building 605, Terminal H (CC H-11/H15 – H1827), Park 4 Flamingo Parking Garage, and Park 2 Consumer (Flamingo Parking Garage).

This report also builds on electrical system residency concepts established in Feasibility Reports #1 and #2, dated December 9, 2024, and April 28th, 2025, respectively. All systems follow similar system design methodology that incorporates industry best practices that enables equipment standardization, reducing total cost of ownership.

The core objective of the feasibility report for electrical resiliency and sustainability is to evaluate the electrical distribution system at MIA to identify electrical risks that could impact operations, identify gaps in electrical resiliency, and develop electrical infrastructure solutions that increase overall resiliency and sustainability in-line with MDC's environmental objectives. There are fifty-two (52) electrical rooms to be evaluated as part of the FPLS scope, each with varying levels of complexity and needs, with a total airport peak demand of around 62MW. Feasibility reports #1 and #2 provide solutions for three (3) electrical spaces, while this Feasibility report #3 groups five (5) separate locations together. Necessary scope combined from these locations totals seven generator replacements, nine switchgear units, five diesel system replacements, and other electrical device replacements.

There are two types of projects that will be submitted to MDC for review:

1) Maintenance Projects – Legally required backup generation systems for life/safety applications
2) Optional backup generation systems for operational resiliency and sustainability

This report is for a Maintenance Project for a legally required backup generation systems at AFL Building 742, AFL Building 605, Terminal H (CC H-11/H15 – H1827), Park 4 Flamingo, and Park 2 Consumer. These spaces are prioritized due to aging condition of the existing electrical equipment and generator, obsolete end-of-life switchgear, and highly critical functions served by these locations – such as lighting significant portions of the airport runways, terminals, parking garages, and other passenger-oriented services.

While detailed scope is specified per individual location in the Project Development sections, overall general scope is 480V switchgear and emergency generator replacement at each location. The scopes incorporate modern technology and FPL's recommendations for design upgrades to increase resiliency, such as main-tie-main switchgear configuration, fuel tank system modernization to limit leaks and optimize maintenance, and cellular based remote monitoring. In addition, the scopes include removal of all decommissioned equipment to reintroduce space for modernized equipment.

The 24/7 operational nature of MIA and criticality of Airport Operational Area (AOA) space is considered with this project work. Three of these locations fall within the AOA (AFL Bldg. 605, AFL Bldg. 742, and Terminal H). As a result, their respective existing indoor spaces are required for their equipment replacement to enable modern code compliance and minimize operational risk. This also applies to the two parking garage locations, which do not exist within the AOA. New switchgear and generator units will be installed in the same footprint as those existing to avoid disruption to ongoing operations.

The commercial mechanism for performing this work is through the FPL regulated tariff program called Optional Supplemental Power Services (OSPS). The tariff is resiliency-as-a-service where FPL owns, installs, and maintains the equipment for twenty (20) years, including warranty and break/fix. The cost is a fixed monthly service payment over the 20-year term, determined by actual cost incurred during construction and covering operations and maintenance by FPL throughout the contract duration. The monthly payment starts once the equipment is operational and providing the resiliency service.

The construction and implementation timeframe for AFL Bldg. 742, AFL Bldg. 605, Park 4 Flamingo, and Park 2 Consumer is approximately two years from a signed agreement, subject to change based on permitting, sourcing process, and other external market factors. Terminal H is projected to hold a slightly longer timeframe of between 2 – 2 ½ years due to its location and specific scope.

Organizational Capabilities.

FPL is well-positioned to support Miami-Dade County's investments in electrical infrastructure that is both hardened for resiliency and environmentally sustainable.

The company is an industry leader in resilient electrical infrastructure since introducing our FPL OSPS program in 2019, delivering large backup power solutions to major institutions throughout the state. Including hurricane tested systems that have successfully provided full electrical resiliency during multi-day electric utility outages caused by recent hurricanes.

FPL is the industry leader in storm response. Florida is impacted by hurricanes or other severe weather nearly every year, it's not a question of if, but when a major weather event will occur. The internal capabilities and external vendor network are fully leveraged to deliver value to OSPS customers. We design hardened systems, but we know things will happen and our preparedness will help ensure there is no delay in the restoration process.

In addition to storm response and weather-related outages, FPL is developing solutions against momentary outages caused by faults downstream in MIA owned infrastructure and considering that these momentary outages can be severely disruptive to airport operations. FPL is an industry leader in maintaining its infrastructure as evidenced by its low SAIDI/SAIFU/CAIDI numbers, despite having some of the most severe weather in the county.

FPL, along with its parent company NextEra Energy, is the world's largest owner and operator of solar generation systems. FPL also owns and operates several utility scale battery storage systems throughout the state. The nuances and lessons learned from past projects are included in how FPL develops solutions for MIA for energy sustainability and reduction in environmental impact.

We look forward to continuing our partnership. FPL has extensive experience in deploying resilient electrical infrastructure solutions designed to meet our customers' needs, and we are happy to serve as an advisor as you navigate this process, leveraging our experience deploying robust, reliable electric infrastructure around the state.

Together, as two of Florida's largest organizations, we can help meet a growing need for resilient electrical infrastructure and position MIA for continued economic prosperity.

Evaluation Methodology

The project team has taken a wholistic approach to the evaluation of MIA, with the clear focus on improving resiliency and sustainability in the electrical distribution circuit. MIA is appropriately considered a city-within-a-city with a very large electrical distribution system that supports 24x7 operations and is a major economic engine with impact globally. The airport complex has grown with the greater Miami-Dade County region over the past nearly 100-years to what it is today. The airport complex will continue to change with major expansion projects, in various stages of development, throughout the MIA geographic footprint.

Given the magnitude and complexity of the electrical system at MIA, the evaluation process starts in documenting the existing state electrical conditions to define the problem statement. The evaluation then considers the county's long-term Capital Improvement Plan (CIP) to ensure all work supports the long-term vision of MIA. This electrical work is heavily driven by codes and standards that must be adhered to for solution development. Essentially, the evaluation process considers where we are today and where we need to be in the future.

The scope of electrical evaluation for existing state conditions focuses on the main electrical distribution panels throughout MIA for energy resiliency and sustainability. This is the head-end switchgear and first point of disconnect from utility power. The scope does not include evaluation of secondary panels and secondary distribution.

Existing State Evaluation

Several factors are documented to define existing state conditions:

- Peak electrical demand, in terms of kilowatt demand (KWD) – this is obtained by performing utility meter analysis, going back several years, where available. Peak demand is the most important information needed to properly size electrical distribution equipment and alternative sources of energy.
- Single-line diagram (SLD) – the SLD defines how the circuit is configured. How the circuit is designed directly influences system resiliency and maintainability, among other factors. OSHA requires an accurate SLD, or equivalent (such as a panel elevation drawing), in all main electrical spaces.
- Floor Plan Layout – the floor plan layout defines physically where equipment is and isn't, it defines the space. Electrical equipment supports revenue generating operations and does not generate revenue itself, thus space used by electrical infrastructure must be minimized where possible.
    - Space is the #1 design constraint at MIA for new work and construction planning.
- Condition assessment – the existing equipment is visually inspected for type of equipment, manufacturer, age, signs of corrosion or previous arc-flash, air-conditioning/humidity control, availability of spare parts, and other factors that contribute to the perceived level of useful life remaining and respective risk profile.

Future State Evaluation

Several factors are documented to define future state electrical needs:

- CIP Projects – The future capital projects for terminal expansion, EV infrastructure, new cargo processing facilities, major facility modifications, etc., all contribute to changes in (a) space and (b) electrical demand. All work is performed in consideration of these future, separately planned projects.

- Electric Vehicles – the impact of electrical vehicle charging is going to drive huge (>20MW) of new load increases at MIA over the next 10yrs. The existing infrastructure, as-is, is not ready for mass adoption. In addition, increased adoption of electrified fleet vehicles will drive future requirements to increase resiliency for EV systems. The feasibility study is considering MDC's plans to electrify fleet vehicles of around 10% per year.
- EV Resiliency – Today, the general opinion of most facility operators is not to backup electric vehicle chargers, however the need for EV resiliency will increase with higher EV adoption. Put differently, this evaluation considers a scenario with high EV adoption and a major utility outage, preventing the ability to charge EV's, including EV trucks, buses, and core operational vehicles. If this scenario occurs, then the ability to recover after a hurricane or major event will be hampered. Incorporating generator backup for EV's enables the County to meet its sustainability objectives while maintaining operational resiliency.

All work must adhere to applicable codes. In addition, the environmental factors that will influence any system design:

- All solutions will adhere to all applicable codes required by the AHJ, including the wind loading requirements for generator systems in Miami-Dade County.
- Flooding and sea-level rise – All design work considers code requirements for existing base-flood elevation plus 1-foot, as well as MDC requirements for future FEMA flood projections to ensure long term resiliency.
- All projects consider salt-spray, jet wash, and other environmental factors. An example of this is the selection of aluminum enclosures instead of steel enclosures.
- The corrosion considerations of electrical systems in South Florida are significant, which contributes to strong bias to install equipment in air-conditioned spaces to prevent unplanned downtime, ensure longevity of equipment, and keep costs under control.
- Underground conduit – In South Florida, ruptured conduit is not uncommon, especially in systems over 30yrs old, which is a major construction risk for nearly every system at MIA. Because all loads are currently connected, there is no way to have assurance that new cable can be pulled through old conduit until the task is complete. As a result, the contingency planning for project work will be extensive, including plans for temporary power while permanent resolutions can be implemented.

Operational and Construction Evaluation

The operational needs of MIA and impact during construction activities also must be considered in development of the problem statement and final proposed solutions. After several meetings and conversations with MDAD Officials, FPL has captured the following operational considerations:

- MIA operates 24/7 – the new equipment must be integrated with a detailed and resilient temporary power plan that minimizes total impact and risk to operations. Including planning details around locations of temporary power equipment, timing of power transfer events, testing processes, and other details to minimize risk of unplanned outages.
- Space must be optimized for airport operations, not electrical equipment. The general goal is to work within the existing footprint of electrical equipment without taking up any new space or minimize new space taken up.
- Construction impact shall be minimized and closely coordinated. An example is underground work to trench and install new conductors within the AOA. This process would require shutting down 1-2 gates for an extended duration as the underground works down the line. This example represents risky construction processes that will be avoided wherever possible and coordinated with MDAD prior to starting construction activities.

- Underground work is risky, especially within the AOA. Underground equipment, while robust, may cause bigger risk overall than the benefit of going underground. All underground work will be evaluated for alternatives and resulting risk to operations.

The evaluation for each electrical space will include commentary for what is there currently, what is needed end-state, and how to get there.

Design Concepts and Solution Development

The electrical resiliency and sustainability solutions developed by FPL to support MIA incorporate best practices from utility operations and industry benchmarking. The system will be robust and secure, both physically hardened and for cyber security. The intent of this feasibility report is to utilize commercially available and proven technologies.

FPL is proposing the following design standard concepts to be incorporated into all electrical project work at MIA. The goal is to reduce total costs for spare parts via less inventory of spares, reduced training costs for having similar equipment, and ensure operational resiliency with maintainable equipment design.

The concepts and technical standards are presented by equipment type:

- Switchgear (low-voltage and medium-voltage)
    - All switches shall be fully rated vacuum circuit breakers, equal or better.
        i. No fused disconnect switches for critical loads.
        ii. Breakers are typically more expensive upfront in comparison to fused disconnects. However, the cost is in operational risk and impact. A real event occurred when a 4160V fused disconnect switch blew in June 2022 in the central chiller plant resulted in over 24hrs of downtime making chilled water and resulted in the passenger area getting very hot. This scenario was exacerbated by lacking electrical monitoring and not having a specialized 4160V fuse readily available. A breaker could have been reset and system back online in minutes, or instantly with system automation.
    - Main-tie-main configuration for all critical panels
        i. MIA is full of radial fed switchgear (only one source). Opening this one source will cut power to all downstream loads. This makes maintenance of the main-service-disconnect switch nearly impossible due to complex outage coordination.
        ii. A main-tie-main helps mitigate risk from breaker failure and ensure maintainability of equipment. For example, if a main breaker fails, then a technician can close the tie-breaker to restore power to connected loads while the main breaker is repaired.
        iii. Additionally, a tie-breaker can be closed to facilitate maintenance of the main-service disconnect while downstream loads are not impacted.
    - Main-Main configuration switchgear instead of Automatic Transfer Switches (ATS, where possible).
        i. A main-main configuration consists of a utility source and backup generator source. The breaker of either source can be maintained while downstream loads remain online.
        ii. ATS' are effective for loads that can take periodic outages, and sometimes code requirements will force the use of ATS's over M-M schemes. However, the mechanism of an ATS represents a single point of failure. This is mitigated by having two breakers, one for utility power and one for emergency backup generation.

  - Remote monitoring
    i. Cyber security measures will be implemented for all project work to ensure a private controlled network.
    ii. All equipment shall have digital controllers with some output for monitoring electrical conditions that ties into a cellular-based remote monitoring system.
    iii. FPL will tie-in all installed electrical equipment to a common monitoring platform.
- Generators
  - Where applicable, multiple smaller engines in parallel can be more resilient than a single big block. Generators, like car engines, have many individual parts that can fail and cause the engine to trip offline. Multiple engines mitigate this risk.
  - Wet stacking is avoided when load is low. Industry rule of thumb is that a diesel generator should have load greater than 30% of nameplate capacity to prevent wet stacking of diesel and prevent risk of fire. Having multiple engines allows under-utilized engines to drop offline while load is maintained with fewer engines operating at loads above target 30% or more.
- Level 1 vs Optional Backup systems
  - The National Electric Code (NEC), Florida Building Code, and other local/state laws require certain electrical configurations and reserve capacity.
  - Level 1 loads are legally required to have backup generation and governed by NEC 700 and 701. Typical examples of Level 1 loads include emergency lighting, elevators, door access, and fire-pumps.
  - Operational loads are typically not legally required to have backup generation. Optional loads are governed by NEC 702. Examples of optional loads are most mechanical equipment (air-conditioning), convenience outlets, baggage handling, retail, etc.
  - NEC and NFPA 110 allows for a generator system to backup Level 1 and optional loads, but with certain circuit configuration and controls.
  - This benefit of backing up optional loads by the same generator system is be considered when performing Level 1 generator projects.

With design concepts created, solutions will be more tightly controlled to promote a robust system design and uniformity for all new project work.

Fuel Source Evaluation

The fuel source for electrical power is essential to system design. At MIA, certain fuel sources are better than others and it depends on the application. This section will explore different technologies for power generation (generators, solar, battery storage, etc.) that are commercially available and provide context as to why one technology is a better fit than other technologies.

Engine Classification	Fuel Type	Considerations
Diesel Tier 2	Diesel Only	EPA qualified for emergency response only. Industry standard for Level 1 generator systems.
Diesel Tier 4 Final	Diesel with diesel exhaust fluid (DEF)	DEF injected into the exhaust. EPA rules require system controller to shutdown system if issue with DEF supply. Qualified for continuous duty / load control.

Natural Gas (NG)	Piped natural gas	EPA qualified for continuous duty. Dependent on natural gas infrastructure.
Liquid Propane (LP)	Stored on-site LP	Not common in large systems due to fuel limitations, high volatility and low energy density (large tanks). Can be stored long-term. Good for small systems (<100KW).
Turbine Engines	Multiple	Turbine engines are not common for backup power applications due to cost compared to alternatives and its slow response times.

Traditional generators for emergency backup power in *large industrial applications* are typically one of three types:

1) Tier 2 Diesel
    a. Pro’s
        i. Established infrastructure and availability.
        ii. Onsite fuel storage enables complete autonomy.
        iii. Reliable performance in severe weather conditions.
        iv. Typically, least expensive in terms of cost per KW for backup power.
    b. Con’s
        i. Tier 2 has higher emissions compared to other fuels.
        ii. Requires regular maintenance and environmental compliance.
    c. Commentary:
        i. Downside is that this is a diesel generator, burning diesel fuel. The EPA has limits on annual runtime that allows for routine testing but prevents this type of generator from participating in a demand-response program or other type of continuous duty base-load generator due to emissions. The EPA allows for this generator to run in extended emergency power outage scenarios only.
        ii. Diesel as a fuel source is proven to be reliable long-term storage with routine fuel polishing and fuel treatments. Diesel is readily available, easy to transport, and less volatile compared to other fuel options.
        iii. Due to high resiliency, lower cost, but with emissions that must be considered, this generator type is recommended for Level 1 legally required life/safety applications.
        iv. Diesel burn rates are not perfectly linear and some engines are more efficient than others, however rough order of magnitude is 70gallons per hour per 1000KW.
            1. For example, a 2MW load is expected to consume around 140gal per hour.
            2. Peak demand of MIA is 62MW, which rounds to roughly 4500gal per hour.
2) Tier 4 Final Diesel
    a. Pro’s
        i. Removes more harmful emissions and is “cleaner” in comparison to Tier 2 diesel.
        ii. EPA permitted for continuous duty and demand response applications.
        iii. Onsite fuel storage enables complete autonomy.
    b. Con’s
        i. DEF cannot be polished and crystalizes over extended periods of time (18-24mo), requires full pump-out and replacement in backup generator applications where the tank may not be used consumed before needing to be replaced.

ii. DEF creates operational risk with additional sensors that create more components that could fail, resulting in greater risk of generator malfunction/downtime.
iii. Higher upfront and maintenance costs compared to Tier 2 diesel.

c. Commentary
   i. Rough order of magnitude, DEF is consumed at around 8-9% the rate of diesel consumption.
      1. 70 gallons of diesel consumed would also require roughly 6gal of DEF
   ii. The EPA allows for T4F generators to run continuously in demand-response and baseload applications.
   iii. The addition of DEF requires two fluids (diesel and DEF) to be stored and maintained for the system to operate. Loss of either fluid, or component failure in any part of the respective system, will result in the generator system not operating.
   iv. Due to increased risk, this type of generator is not recommended for any Level 1 system in a single engine configuration but would be a good fit for optional backup systems, especially with multiple engines in parallel.

3) Natural Gas
   a. Pro's
      i. Cleanest burning fuel in comparison to diesel.
      ii. EPA permitted for continuous duty applications and level 1 applications.
   b. Con's
      i. Relies on external natural gas pipelines that are reliable but not guaranteed.
      ii. Local infrastructure may not be able to support high consumption rates.
      iii. Higher upfront cost due to large engine size.
   c. Commentary:
      i. The fuel consumption rough order of magnitude is 12,000scfh per 1MW of generation.
         1. MIA is 62MW of peak demand, this would be roughly 750,000scfh without any safety factor for pipeline sizing.
      ii. NG is the cleanest burning backup generator system from an emissions standpoint. The EPA also allows for NG generators to run continuously and in demand response applications.
      iii. The downside to NG is that onsite fuel storage is not practical and thus it relies on the availability of natural gas piping. There are methods of storing natural gas onsite such as compressed natural gas or liquified natural gas (LNG), but these systems are physically large, very high in maintenance, and only provides a few hours of autonomy in-case of a loss of pressure in NG pipelines. Compressed NG systems or LNG systems are rare for backup power systems due to relatively high costs compared to alternatives.
      iv. Code allows for natural gas in Level 1 systems. However, major utility systems, including FPL, have emergency plans in place to generate electricity with liquid fuel in-case of a natural gas pipeline disruption, thus it is hard to recommend a resiliency system that relies solely on natural gas. Due to debatable resiliency risk, this evaluation and feasibility study is taking a conservative stance on NG.

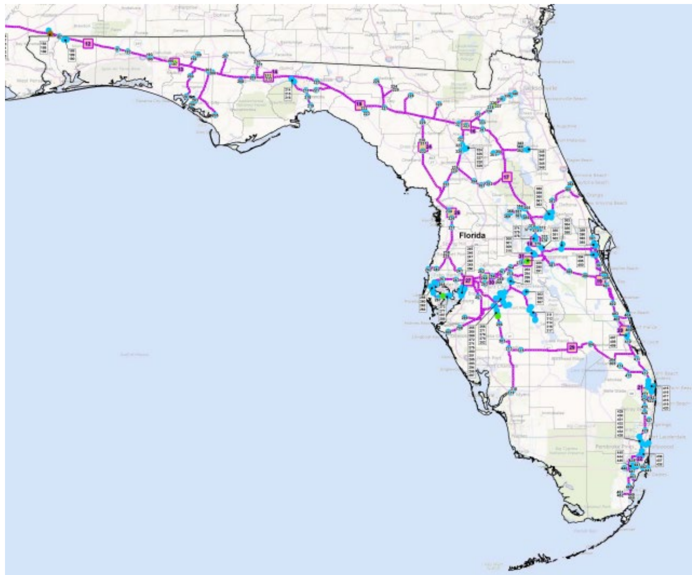


Figure 1 - Map of Natural Gas Transmission Line from Florida Gas Transmission Company, LLC

Diesel Alternatives

Generators that utilize internal combustion (ICE) engines can be powered off other fuel sources than diesel and natural gas and are discussed for viability as it relates to MIA:

Fuel Type	Pro's	Con's
Biodiesel	Renewable, biodegradable, liquid fuel alternative to diesel.	Issue with long-term storage that could cause engine malfunction, cannot be polished. Requires extensive fuel management plan.
Hydro-treated vegetable oil (HVO)	Renewable, biodegradable. Significant reduction in greenhouse gas (GHG) lifecycle emissions. Better storage than Biodiesel. Similar energy density and combustion characteristics as ultra-low sulfur diesel.	More costly than diesel (~30-50%), limited infrastructure and availability (but growing). Not enough public data on long term storage and reliability in multi-year basis.
Hydrogen	No carbon emissions in combustion.	Technology is not commercially available (yet). Expensive infrastructure for production, storage, and distribution. Fuel volatility and metallurgy issues must be overcome before mass adoption.
Ethanol	Renewable, often blended with gasoline.	Corrodes fuel lines and clogs fuel injectors.

Biogas	Renewable, common byproduct of landfills.	Limited supply

The takeaway for diesel alternatives is that these technologies are advancing in the market. Biodiesel and HVO are both drop-in fuel replacements for traditional off-road diesel used in generator systems, meaning it can be mixed with diesel without system modifications, simplifying its adoption. However, both biodiesel and HVO require extensive fuel management plans. The known operational risk of Biodiesel makes it unattractive in legally required systems due to life-safety application of the system. In optional backup power systems, biodiesel and HVO represent a viable alternative that will be considered, along with a comprehensive fuel management plan.

Renewable Energy Sources and Battery Storage

In addition to traditional internal combustion engines for a generation source, this feasibility study considers commercially available alternatives to ICE systems.

Fuel Type	Pro’s	Con’s
Solar	No emissions powered by the sun. Very low maintenance. Established technology with clear interconnection guidelines. Excellent sustainability play.	Solar glare must be considered for airline safety. No generation at night and issue with small clouds. No reduction in demand charges. System turns off during utility outage (grid-following).
Battery Energy Storage Systems (BESS)	Grid-forming inverters can be used in backup power applications. New battery types emerging to reduce fire-risk. Can be used for peak demand shaving.	Continuous energy losses charging, discharging, and maintaining the battery system. Increases total carbon emissions when charged by normal utility source due to losses. Difficult to maintain demand response benefits long term. Safety codes influencing design are getting much tougher.
Wind Turbine	Clean and established technology. Excellent in windy, but not too windy areas.	Not economical or reliable in Florida due to intermittent winds and sudden strong thunderstorms. Difficult to install in urban areas due to size.
Small Modular Reactors (SMR’s) (discussion only)	Emerging nuclear technology that is potentially clean, hardened, and reliable. Base load considerations.	Not publicly available. Major risks and uncertainty remain on the topic. Not considered for this project work.

The takeaway for renewable energy systems is that solar is an excellent system for base-load and sustainability. Batteries are themselves not clean but certainly have a place in certain system applications.

CIP Considerations

The Capital Improvement Plan for MIA has been considered to ensure this project does not conflict with other planned work at MIA. FPL's understanding is that all systems within Group 1 will not be impacted and remain as-is for future CIP projects.

These areas are assumed to have electrical load growth greater than 25% during the life of the equipment with additional resiliency needed from these generator systems. The two primary drivers of load growth are:

1) Future CIP projects will add new loads that will be fed off this equipment and some space served by this electrical distribution is temporarily vacant. New load attributed to occupied space is difficult to estimate, reasonably 250-500KW or more of future load growth is assumed for the purpose to ensure operational resiliency.
2) Electric Vehicles – the generator systems today will not be connected to EV chargers; however, provisions will be put in-place to enable EV resiliency later at a saving to the 5 locations within Group 1. The spaces have available space in vicinity to serve future EV chargers and may serve as a focal point in future to supply electricity to various vehicles, depending on location and type of vehicle requiring charge.
    a. The feasibility report and resulting project scopes contemplate high EV adoption and resulting operational dependency on EV charging infrastructure, including future needs for resilient electric power (via backup generator) to EV chargers in case of a major grid outage event.

With respect to AFL Bldgs. 605 and 742, appropriate capacity must be available at these lighting vaults to serve any modifications to airfield lighting operations and other future loads. Likewise with Terminal H, Park 4 Flamingo, and Park 2 Consumer; capacity must be available to maintain critical life/safety operations per site.

On the other hand, further detailed design analysis at the various site locations may call for equipment size reductions given load and demand changes from original installation, as well as potential CIP involvement. This study has assumed and followed an equal-sizing replacement based off existing infrastructure and overall CIP growth projections. Equipment re-sizing would occur in the design phase with further detailed development.

AFL Vault Bldg. 742 (MDAD EG-202)

Project Solution Development – AFL Vault Bldg. 742

All project work will be executed in a design-bid-build turnkey project, based on estimates and design guidance established in this feasibility report. This feasibility report is concept level based on design guidance previously established and not permit level drawings or detail.

The project description for AFL Vault 742 is the end-of-life equipment replacement/modernization of the 480V emergency generator system and main distribution switchgear replacement. The buildout of new switchgear, downstream devices/panels within scope, and related construction will occur in the main electrical room housing the existing generator in Bldg. 742 as well as an adjacent storage room. Twin generators will be installed in the adjacent storage room which will free up space in the existing main electrical room. The aim is to decongest the existing electrical room and utilize nearby unused indoor space. A new above-ground diesel tank will be constructed nearby in open space outside the main entry doors of the electrical/generator room to reduce and minimize issues currently experienced from the existing underground diesel storage system, such as leaks. There is adequate space for these new diesel tanks such that disruption to ongoing operations outside is minimized, in addition to a new outdoor enclosure.

Figure 1.1 - Project Location (AFL Bldg. 742)

Condition Assessment – AFL Bldg. 742 Main electrical/generator room

The condition of the existing equipment is *poor – risk to operations*.

- 2yr peak electrical demand, based on meter analysis, is 165KW.
- The space is original construction serving critical lighting and operation loads for the airfield runways, allowing air traffic to navigate, depart, and arrive safely.
- Electrical Room
  - The 500KW Caterpillar generator is at end-of-life state, commissioned over 25 years ago. It contains an analog setup with no remote monitoring communication. The generator shows signs of wear and tear, rust, and patched retrofits. The associated battery system is on a raised surface adjacent with visible leakage. The exhaust system points outward to the exterior of the building.
  - The switchgear (Siemens) is at its end-of-life state and replacement/modernization is needed to maintain the critical loads. The switchgear is standalone and contains adequate room around its perimeter for general work/construction activity. The main utility breaker is found on the left side of the gear when facing its front (utility breaker towards the back of the room with POV from the main doors) and labelled appropriately. On the opposing side lies the main generator breaker and the automatic transfer switch is in the center of the switchgear. Pipes connect upstream and downstream to the 3 sections overhead.
- Space
  - Main electrical/generator room
    - The room contains adequate space for its existing equipment. The switchgear is standalone in the center of the room with space on its perimeter. There are no mounted devices on the north wall directly behind the switchgear, with ~3ft separation between the gear and wall. There is a metal cabinet along the wall near

the switchgear. The switchgear is located across the room's central walkway from the generator. The MDP is housed in the back of the room beside a step-down transformer.

- This existing space will be utilized to facilitate buildout of new equipment and replacement of existing. Devices will be physically removed through the main entry doors of this room to the outside (NE).
- The relocation of the generator to the adjacent storage room should free up space for this scope of work as well as future projects to serve the building's future utility needs.
- Temporary conductors during construction will run thru the back of the electrical room on the floor, thru the rear room door, around two corners, and along the floor of the critical lighting room to outside doors in the back of the building. This route runs roughly 200ft in length. Mobile switchgear and generators have adequate space to be housed outdoors for this concept.

- Storage room
  - There is a storage room to the northwest of the existing electrical room which includes plentiful space for a new generator system. The room holds access to the outside via the northwest wall. There is accessibility to this door from the grassy area outside. Further electrical equipment may be considered to be placed in this space pending further design analysis.
- Outdoor Space
  - There is plentiful space available for construction activity - including equipment movement, vehicles, and staging of temporary equipment outside the main entry doors of both the electrical room and lighting room, with low impact to local road traffic or nearby existing operations.
  - The area in front of the electrical room is nearly all asphalt. There are rocks along the building wall and a concrete pad at the electrical room entry doors.
  - The area north of the transformer leading to outside the lighting room (doors on NW side of building) is open grassy area with chain-linked fences in vicinity. Entry is available to open area.
  - The existing diesel tank storage system is housed under asphalt (underground).
  - The space is suitable for activities related to the removal of the old generator system and installation of the new. The existing diesel system will be removed, and a new tank is intended to replace in the open asphalt by the building.
  - Some existing, currently unused outdoor space will be utilized for this project.
  - Installation of bollards will coincide with protection for the new diesel tank storage system.
  - Building 742 is located within the AOA, with the closest security gate to the west via the cargo area. There are active runways on 3 sides of the building's vicinity.
  - A rough location plan is established in this feasibility study but exact location of equipment, such as an exterior generator casing and diesel tank, will be finalized in the design phase.

Figure 1.2 – Electrical/generator room, from POV at main entry doors. Generator on left, switchgear on center-right, and MDP located in rear-left. Utility feed entering overhead from top right of photo.

Figure 1.3 – Frontal view of switchgear

Figure 1.4 – Switchgear with entry doors in rear

Figure 1.5 – Angled view of generator

Figure 1.6 – Rear view of generator with diesel day tank in corner. Main entry doors to room visible behind generator

Figure 1.7 – Frontal view of MDP

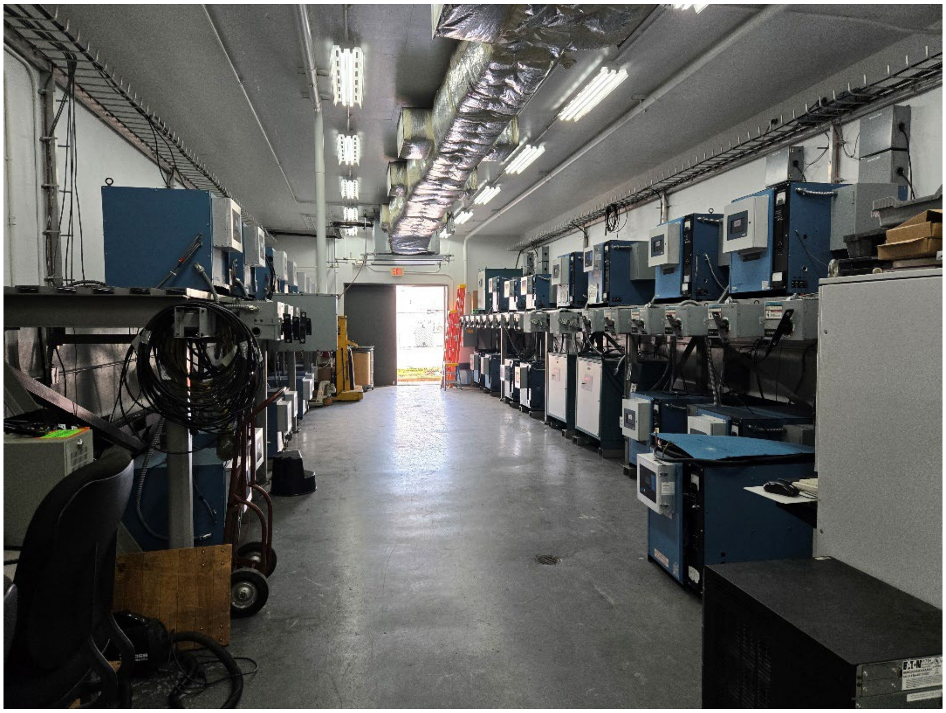


Figure 1.8 – Lighting room in rear of building. Temporary conductor route to be placed along floor from outdoor entry.

Figure 1.9 – Area outside lighting room entry doors to potentially house temporary equipment.

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Figure 1.10 – Frontal view of entry doors into electrical room, pad mounted transformer, and overhead pipes leading inside

Figure 1.11 – Outdoor area in front of Bldg. 742

Figure 1.12 – Underground diesel storage tank location (~85ft SE of pad mounted transformer)

Figure 1.13 – Outdoor area in front of Bldg. 742

Figure 1.14 – South side of the building

Figure 1.15– Grassy area leading to west side of the building

Figure 1.16 – Grassy area south of building with fence. Cargo area behind fence.

Figure 1.17 – Alternative view of area in f/o AFL 742.

Project Plan – AFL Bldg. 742

To address the operational risk identified in the condition assessment and incorporating the design concepts for FPL backup generation systems at MIA, the following concept solution is proposed. This solution will be executed in a design-bid-build project plan.

Project Description – AFL Bldg. 742

Backup power service to provide an alternative source of electrical power and electrical distribution equipment to AFL Bldg. 742. Based on site installation conditions and electrical load data, Company expects to utilize 500KW of backup generation capacity, controls, and new main distribution switchgear to provide service to the electrical loads, based on the historical 24-month metering data, associated with FPL Account Number 24535-74853.

Scope of Work – AFL Bldg. 742

See appendix for system drawings. The scope includes all construction and permitting by licensed contractors, per applicable codes.

The new generator system will replace the existing in the adjacent storage room, like-for-like. The new generator system will serve the same electrical systems as the existing.

<u>Electrical System</u>

- 2x 250KW Tier 2 Generators
  - 24-hour adjacent day tank(s)
  - Battery charger/maintainer (1 per Generator)
- 1200A 480V Emergency Main Switchgear
  - Distribution & Generator Paralleling Controls
  - Programmable logic controller (PLC) controls
  - Automatic transfer switch
  - Indoor rated equipment
- Main Distribution Panel (MDP)
  - Main-Tie-Main system – includes a MDP for generator feed and MDP for utility feed
  - PLC controls
- Remote monitoring
  - Generator system and switchgear
  - Cellular based
- Diesel fuel storage tank
  - Outside, above-ground 2000-gallon standalone tank
  - Sized appropriately to generators
  - Modern leak detection system

<u>Building Upgrades</u>

- Replacement of existing generator, switchgear, and refurbishment of existing space.
- Update and modify diesel pipe routing from a newly installed tank into the electrical room.
- Adjacent storage room to harbor two new generator units
- Closed vents & door replacements for electrical (switchgear) room

<u>Temporary Power Plan</u>

- A robust temporary power plan is intended and will be evaluated with MDAD during the detailed construction phase of the project.
- At a minimum, all loads are assumed that brief outages can be planned/coordinated with stakeholders to tie-in temporary equipment. This enables continuous operations while electrical work takes place.
- Temporary equipment can be tied in at the main distribution panel.

Schedule – AFL Bldg. 742

A project timeline is included below. This timeline reflects estimated date ranges of work to be performed. Actual dates may vary, are non-binding, and are subject to change. The below critical items are required from MDC to move forward in each phase of the project construction timeline.

Milestone	Week(s)
Signed Agreement / PO Issued	1
Procurement - Public Notice	2 - 6
Procurement - Engineering Services	6 - 8
Selection - Engineering Services	9 - 10
Engineering Phase	10 - 18
Start Procurement - Equipment & Services	16 - 22
Selection - Equipment & Services	22 - 23
Permit Submittal	22
Long Lead Sourcing / Planning / Permit Acceptance	23 - 75
Start Construction	78
Ground work	78 - 88
Generator Delivery & Gen Switchgear	89 - 92
Critical Event - Cutover #1 - A Side	93
Critical Event - Cutover #2 - B Side	94
Final System Commissioning / Closeout	95 - 96
Contingency	97 - 104

Performance Bonds

Single instrument Payment and Performance Bonds will be obtained for each construction project. These bonds will remain in effect for six months following construction operation date. Fees related to bond costs will be determined based on specific project requirements and risks and will be passed on to MDC at FPL cost in each applicable statement of work as part of the service fees thereunder.

Responsibility Matrix

FPL is responsible for design and proposal of backup power solutions and distribution-related service upgrades. Various departments within FPL will be involved throughout the project. Similarly, MDC has identified departments to be involved in certain key processes. A listing of the departments involved is included below.

	FPL	Miami-Dade
Technical Feasibility		
Equipment designs	Engineering & Construction (E&C)	MDAD
Service upgrades	Power Delivery (PD)	MDAD
Installation Analysis		
Agreement & SOW	Development, Legal	RER, MDAD
Procurement	E&C, Sourcing	MDAD, RER
Permitting	E&C	RER, MDAD, City of Miami
Inspections	E&C	RER, MDAD, City of Miami
Flood Zones	E&C	MDAD, RER
Sea Level Rising	E&C	MDAD, RER
Tree Removal Impacts	E&C	RER, MDAD
System designs	E&C	MDAD, RER
Service upgrades	PD	MDAD
Account set-up	Development, Customer Service	MDAD

Technical and Construction Feasibility – AFL Bldg. 742

The AFL. Building 742 system represents a critical system to upgrade and modernize due to 24/7 operational requirements, age of the existing equipment, lighting load, and airside/landside equipment placement.

New switchgear and downstream equipment will be installed where existing is housed in the main electrical room. New space is required outside the electrical room for a new diesel tank, which is currently asphalt pavement, specifically in vicinity of existing diesel fuel line routing. New space in the adjacent storage room will be utilized for placement of the new generator system.

Scope of work will require removal of the existing generator, diesel tank, and all associated plumbing. Placement of tanks and associated bollards will require new permanent space. Temporary equipment during construction will require some space and temporary provisions and coordination with vested parties.

Numerous unknowns exist underground, particularly with the diesel piping, with consideration of leakages in the past. It is reasonable to anticipate potential underground FPL utility lines from the manhole to the pad mounted transformer, and from the transformer to the building on the secondary side.

The type of mechanical equipment contemplated does not trigger additional requirements for other building upgrades to adhere to LEED Silver Certification. LEED certification is not in-scope for Bldg. 742 electrical system upgrades.

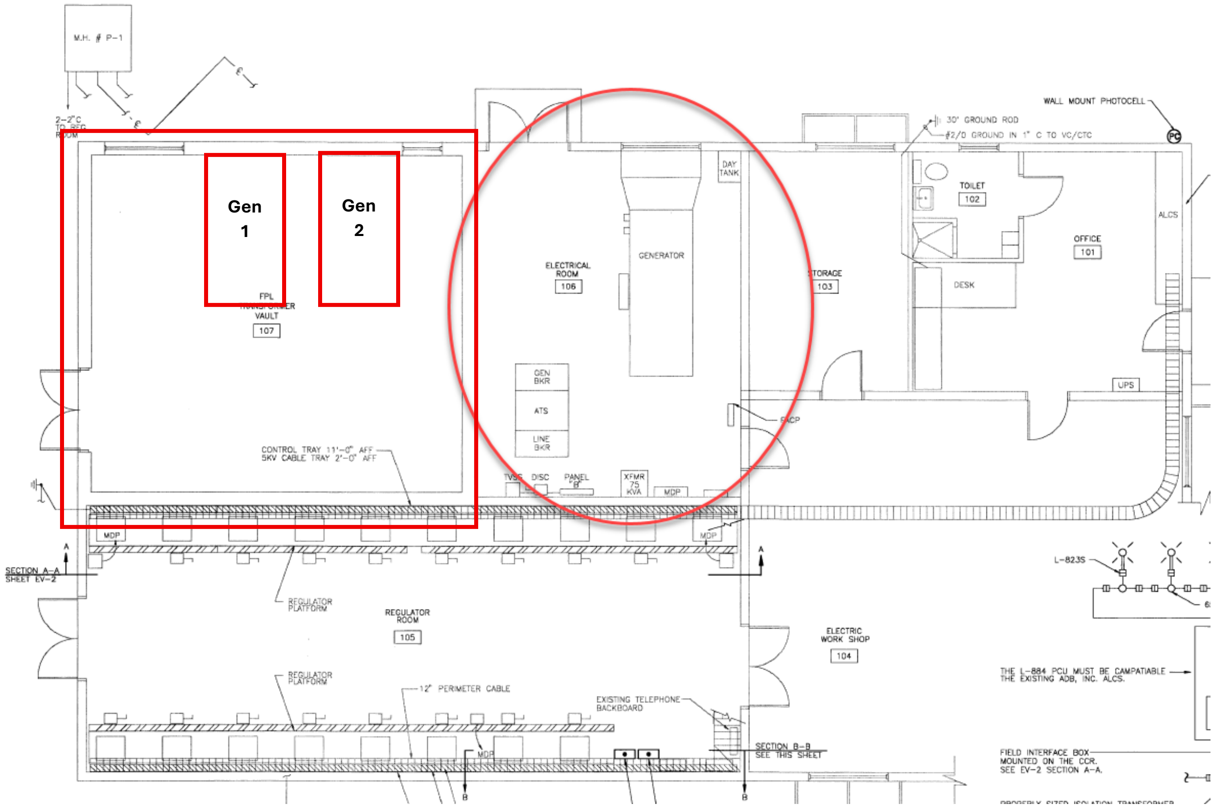


Figure 1.18 – Location of electrical room in building circled (center). Adjacent storage room denoted by red square with rough location placement of generators. Note: drawing indicates adjacent FPL vault, but no such vault is present in building. This is the adjacent storage room referenced previously for new generator placement.

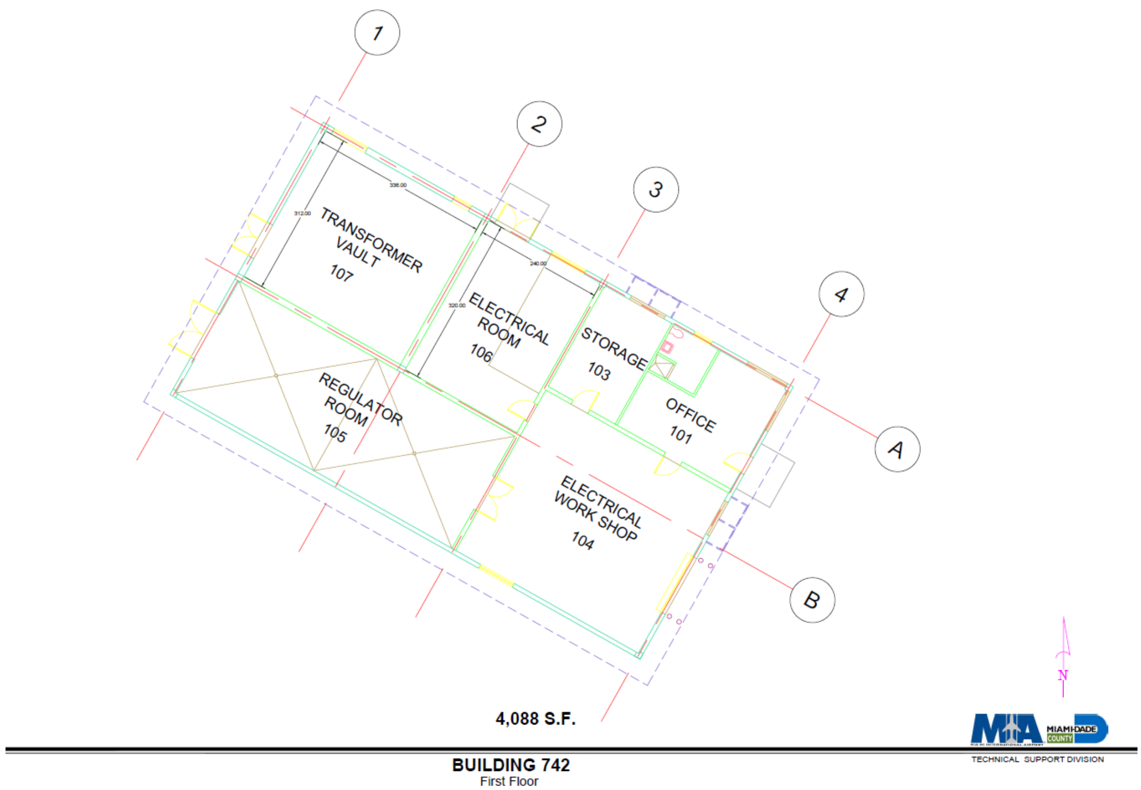


Figure 1.19 – Diagram of AFL Bldg. 742

Permit Applications and Inspections – AFL Bldg. 742

Permits are required for all electrical work per Florida Building Code, Miami-Dade County Code, and City of Miami code enforcement. All applicable codes will be adhered to and formalized in the design stage of the project by the Engineer of Record (EOR).

Engineering Services – AFL Bldg. 742

No engineering services have been utilized in recent history to FPL's knowledge to address the electrical system at Bldg. 742. As part of this project, we will follow the county's process for obtaining bids, selecting a contractor, and obtaining necessary drawings for the project's scope.

Financial Feasibility – AFL Bldg. 742

The OSPS Backup Generator Monthly Service Payment for AFL Bldg. 742 is estimated based on pre-survey design and prior to equipment purchase and installation. As stated in the Statement of Work (SOW), actual costs are estimated as a range for rough-order-of-magnitude planning and approval. The actual cost will be based on 100% permit approved design and competitive bidding, based on concept developed in this feasibility report. The monthly service payment is for 20yrs, fixed, and includes all maintenance, break/fix, and emergency support costs per the SOW. The monthly payment goes on the utility bill and starts after the system is fully commissioned, helping MDC delay capital expenditures.

OSPS Monthly Service Payment

AFL Vault 742	Monthly Service Payment
High Estimate	$38,901
Low Estimate	$29,176

The primary driver for the high range is uncertainties in global supply chains and high operational risk mitigation cost. All cost elements will follow MDC's approved sourcing method in the SOW.

No net change to fuel usage is expected as part of this project work.

- The new generator system will test and operate similarly as the existing in place, with difference of diesel storage location. The generator will be split into twin units to improve resiliency while maintaining the same coverage.
- Fuel costs are the only variable cost that will continue to be paid by MDC.

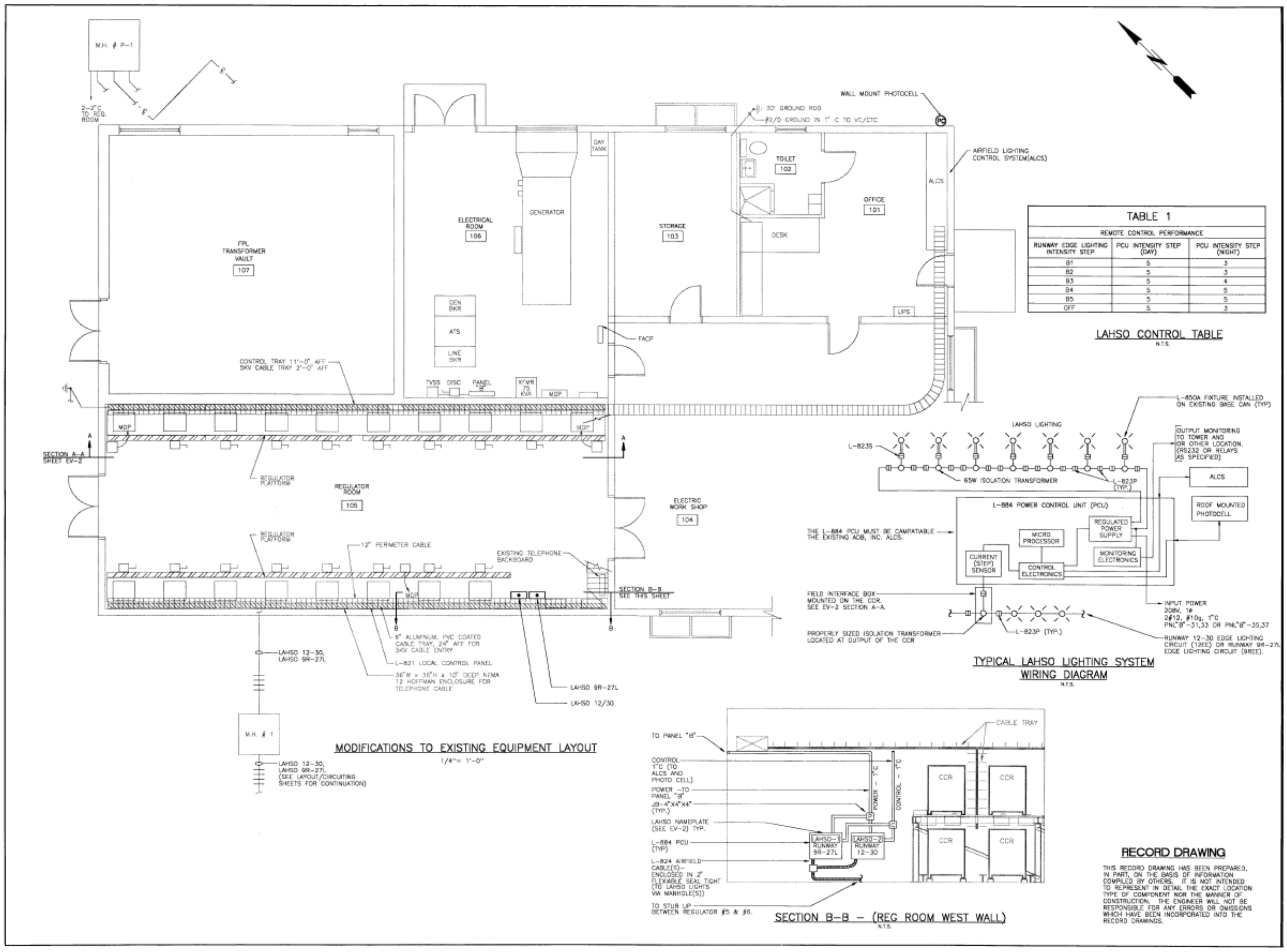
No net change to electrical consumption is expected as part of this project work.

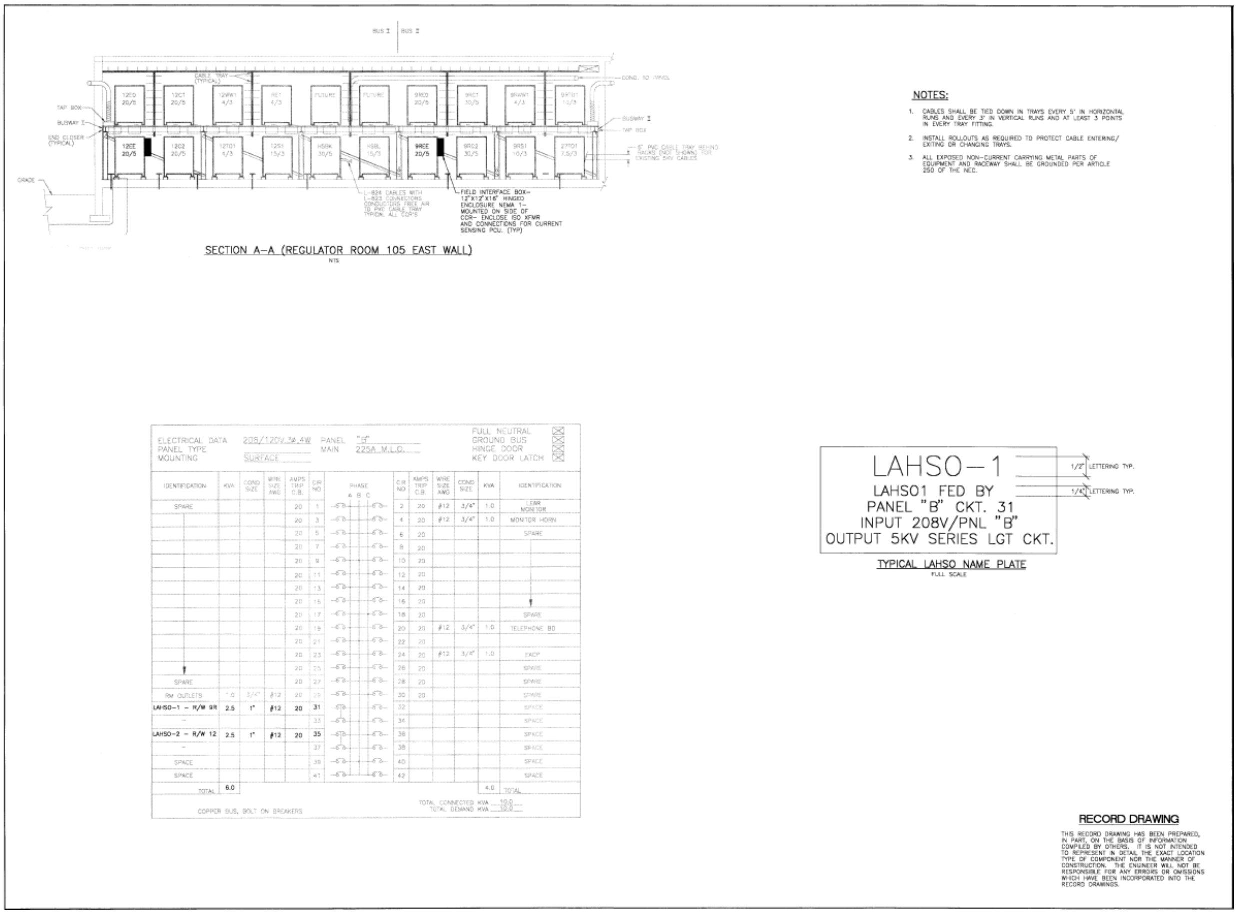
- The new generator system is emergency backup only. It does not provide baseload support.

Conclusion and Recommendations – AFL Bldg. 742

FPL recommends immediate replacement and modernization of the aging electrical infrastructure at MIA AFL Bldg. 742. Should the County proceed with a Non-Residential Backup Power Services Agreement and corresponding Statement of Work with FPL for the identified work by February 2026, FPL is prepared to support construction and installation of the equipment to be operational in 2028.

Appendix – System Drawings (AFL Bldg. 742)





AFL Vault Bldg. 605 (MDAD EG-221 & EG-222)

Project Solution Development – AFL Vault Bldg. 605

All project work will be executed in a design-bid-build turnkey project, based on estimates and design guidance established in this feasibility report. This feasibility report is concept level based on design guidance previously established and not permit level drawings or detail.

The project description for AFL Vault Bldg. 605 is the end-of-life equipment replacement and modernization of the 480V emergency generator systems and associated main distribution switchgear replacement. The buildout of new generators and switchgear will occur in the identical generator/electrical rooms as existing equipment to minimize operational risk during construction. The development concept is a like-for-like replacement strategy on equipment, with generator resizing taken into consideration.

FPL Services

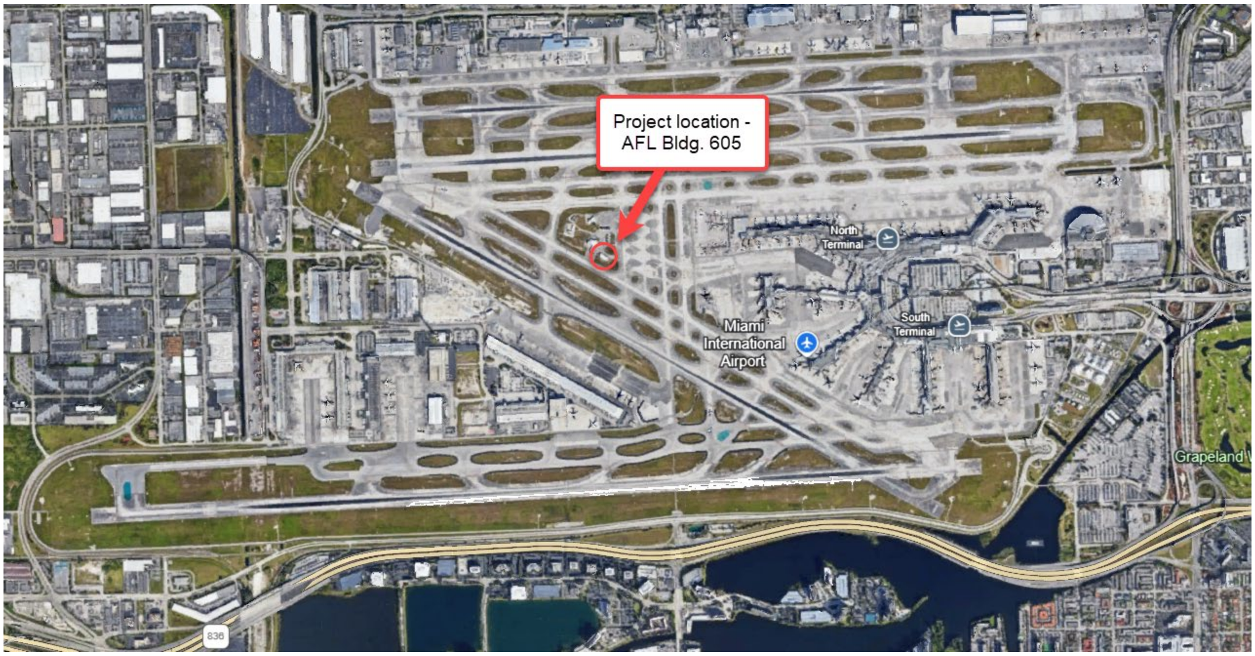


Figure 2.1 - Project Location (AFL Bldg. 605)

Condition Assessment – AFL Bldg. 605

The condition of the existing equipment ranges varies per item in this space. The existing 500KW generator's main distribution switchgear unit is in a moderate condition and will not be included in this project's scope. Remaining switchgear, generator units, and diesel infrastructure will be resized and replaced. The generator rooms are noticeably hot, and mechanical scope will be included to ensure ventilation and temperature control are optimized for new installation in these areas.

- 2yr peak electrical demand, based on meter analyses, is 302KW and 81KW respectively.
    - Demand has reduced in recent years due to improved lighting efficiencies. Downstream devices however still maintain their same size and future vehicle electrification efforts must be considered. The generator sizes will be reduced overall upon replacement but still exceed electrical demand to allow flexibility for future loads. Their sizes will be verified in the engineering phase as well.
- The space is original construction serving critical lighting and operation loads for the airfield runways, allowing air traffic to navigate, depart, and arrive safely.
- **Current 900 KW Generator Room**
    - The Onan Cummings generator is at its end of life and warrants replacement. It was installed in ~2001.
        - The controller does not communicate to any central BMS system. A remote monitoring system will be installed.
    - The generator is not emissions compliant for current EPA rules for curtailable systems.
    - The engine is in the center of the room with the exhaust system pointed outdoors towards the back of the room. Removal should avoid significant complications as the exhaust system faces outside directly.
    - The room's west wall includes several downstream devices and panels. These devices may be re-positioned on the wall to provide space for a new generator paralleling switchgear unit. This is the preferred location for a new unit.

  - The device includes two downstream conductors on the floor which run to a bypass panel in the rear right of the room. This device goes to the new generator switchgear lineup and will be kept in place.
  - The room includes sufficient space for general activity related to this scope.
  - The generator in this space will be replaced with a 500KW system, thereby holding a reduced footprint. The available space on the NW side of the room, after relocation of various existing devices, will be utilized for installation of generator paralleling switchgear.
  - 5 sets of conductors run underground from the generator within this room to associated switchgear in another location in the building. This run will be re-routed to a new paralleling system.
    - This associated referenced switchgear will be replaced as part of overall scope.
  - The diesel day tank in this room needs replaced as part of the scope.
  - The room is noticeably warm and conditions will be further evaluated to ensure new electrical equipment is installed in a well-ventilated, temperature controlled environment.
- **Current 500 KW Generator Room**
  - This room is located adjacent to the 900KW Generator room previously referenced.
  - The Detroit Diesel generator is approaching its end of life, installed in 2002. The generator warrants replacement. The controller itself does not communicate to any central BMS system. A remote monitoring system will be installed.
  - The generator lies in the middle of the room and the exhaust system is pointed outdoors towards the back of the room. Removal should avoid significant complications as the exhaust system faces outside directly.
  - This generator ties into a switchgear unit downstream via overhead conductor, which was also installed in 2002. This switchgear is located outside of the 500KW Generator Room and will be referenced in its own section.
    - The overhead conductor will be intercepted and re-routed to a new parallelling system previously mentioned in the adjacent generator room
  - The room includes a diesel day tank which requires replacement
  - The room includes plenty of space for activity related to this scope.
  - The room is noticeably warm and conditions will be further evaluated to ensure new electrical equipment is installed in a well-ventilated, temperature controlled environment.
- **Rear Lighting/Electrical/Switchgear Room "Regulator Room"**
  - The room contains adequate space for its existing equipment. The switchgear is front facing in the southwest corner of the room and located at the end of the main hallway leading to the main doors leading outside.
  - The switchgear unit itself had a custom build-out on the back end to fully enclose the incoming cable from underground ducts leading into the switchgear. There is an encasing and a small door for protection on the side of main access.
  - There is a mounted step-down transformer and associated paneling on the wall immediately across the thruway from the switchgear unit's south side. These items will need to be considered in construction for the switchgear's ultimate replacement.
  - The rear lighting/electrical room houses airfield lighting power equipment on pedestals along the hallway, all downstream fed from the switchgear unit(s). Each lighting pod holds a tap box which will need to be utilized and considered as loads are transferred amongst temporary cutovers.
  - The room holds sufficient space on the ground for temporary conductor routing from temporary switchgear and generator, which will most likely need to be placed outside, in the grassy area, to the main doors leading into this room.

  - The existing space will be utilized to facilitate buildout of new equipment and replacement of existing. Devices in this room will need to most likely be removed physically via the main walkway from the lighting room(s) to the outdoors, passing the main generator rooms along this long hallway.
  - This switchgear will be fully replaced with a modern unit in the same location as that currently existing. Pipes and cable runs will be replaced to fully modernize the system and ensure utmost performance.
- **Northeast Lighting/Electrical/Switchgear Room "Shop Area"**
  - The room contains airfield lighting equipment on the right side as you enter from the main entry doors. The generator rooms are located adjacent to each other on the left side of the main walkway. At the end of the walkway on the right is situated the switchgear unit associated with the 500kW generator. Pipes run overhead in the vicinity to and from this device. A better visual diagram is found in figure 19. This will likely be the better hallway to access generators and switchgear units within this building if temporary conductors will lie in the floor of the regulator room.
  - To the right of the previously mentioned switchgear is an open area in the corner of the room that may house a new paralleling switchgear unit. The preferred location is in the Current 900 KW Generator Room, but this location may potentially be considered for placement.
- **Space**
  - Outdoors
    - Area located airside on the AOA and requires security clearance for site access. Vehicles need to be escorted to cross the airfield taxiways.
    - Area to northeast of building is open for temporary equipment. There is a paved road leading to the airfield fire station located directly across. There is sufficient room in vicinity for equipment and construction activity to minimize disruption to ongoing local airport operations. There are active runways on all sides of perimeter of "island", which absolutely cannot be encroached upon.
  - Indoors
    - New space is required within Bldg. 605 to facilitate buildout of new equipment in the Generator Room currently housing the 900KW unit (The SE corner room). This is apart from use of hallways to land temporary conductors. One feeder will be migrated at a time during this process for the replacement of one switchgear unit.
    - Equipment will be replaced in the same location. In the SE corner room, a new 500 KW unit may be slightly repositioned to provide additional space for a new paralleling switchgear unit.

Figure 2.2 – 500 KW Generator Room (looking in from door)

Figure 2.3 – Angled view of 500 KW generator

Figure 2.4 – Wide-angled view within 500 KW generator room

Figure 2.5 – Associated diesel day tank inside 500KW generator room

Figure 2.6 – Switchgear unit to remain as-is (associated with 500 KW generator). Located outside of generator room(s).

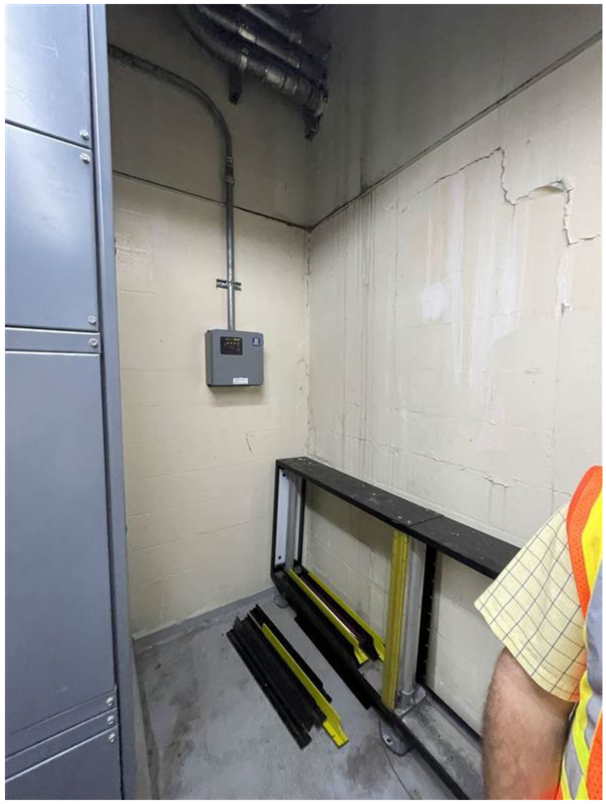


Figure 2.7 – Space to right of 500 KW-associated switchgear unit

Figure 2.8 – 900 KW Generator Room (looking in from door)

Figure 2.9 – Angled view of 900 KW generator

Figure 2.10 – 900 KW Generator's downstream conductors

Figure 2.11 – Northeast corner of 900KW Generator Room

Figure 2.12 – Northwest corner of 900KW Generator Room

Figure 2.13 – Associated diesel day tank inside 900 KW generator room

Figure 2.14 – Switchgear unit in lighting room, associated with 900 KW generator (this unit to be replaced)

Figure 2.15 – Side photo of switchgear associated with 900 KW generator (this unit to be replaced)

Figure 2.16 – Side photo of switchgear associated with 900 KW generator (this unit to be replaced)

Figure 2.17 – Lighting room hallway leading to entry doors, taken from 900KW gen associated-switchgear unit

Figure 2.18 – Lighting room "regulator room" hallway leading to switchgear unit at end of hall on right, taken from entry doors

Figure 2.19 – Diesel pipes running into bldg. from twin 4000-gal diesel tanks

Figure 2.20 – Open paved area on north side of building, facing east

Figure 2.21 – Open paved area on north side of building, facing west

Figure 2.22 – Open grassy area on rear (south) side of building, runway in background. Facing southwest

Project Plan – AFL Bldg. 605

To address the operational risk identified in the condition assessment and incorporating the design concepts for FPL backup generation systems at MIA, the following concept solution is proposed. This solution will be executed in a design-bid-build project plan.

Project Description – AFL Bldg. 605

Backup power service to provide an alternative source of electrical power and electrical distribution equipment to AFL Bldg. 605. Based on site installation conditions and electrical load data, Company expects to utilize a total of 1MW of backup generation capacity, controls, and new main distribution switchgear to provide service to the electrical loads, based on the historical 24-month metering data, associated with FPL Account Numbers 66748-53327 & 28542-41474, respectively.

Scope of Work – AFL Bldg. 605

See appendix for system drawings. The scope includes all construction and permitting by licensed contractors, per applicable codes.

The new generator systems will replace those existing in the same locations. The generator system will serve the airfield lighting and other loads currently served from AFL Bldg. 605.

Electrical System

- (2) 500KW Tier 2 Final Generators
  - 24-hr day tank replacements
  - Battery charger and maintainer per generator
- Main Distribution Switchgear – 1600A, 3PH, 277/480V
  - Fully rated. Full replacement of the switchgear located in the regulator room, associated with the existing-900KW generator system.
  - Indoor rated equipment
  - PLC Controls
- Generator Paralleling Switchgear,
  - Main-Main configuration, fully rated
  - Indoor rated equipment
- Remote monitoring
  - Generator system and switchgear
  - Cellular based remote monitoring to be installed on all units
- Diesel fuel storage tanks
  - Removal of the existing twin 4000-gallon diesel storage tanks with replacement of one 5000-gallon tank to feed both generators. Scope includes replacement of associated downstream piping to the generator room(s)
  - Modern leak detection system
  - Sized appropriately for generators for 72-hour emergency supply

Building Upgrades

- Removal of existing 2 generators, 1 switchgear unit, and refurbishment of space
- Modernization of diesel tanks and associated piping
- Replacement of subpanels per need

- Air ventilation improvements and conditioning assessments in rooms of scope

Temporary Power Plan

- A robust temporary power plan is intended and will be evaluated with MDAD during the detailed construction phase of the project.
- At a minimum, all loads are assumed that brief outages can be planned/coordinated with stakeholders to tie-in temporary equipment. This enables continuous operations while electrical work takes place.
- Temporary switchgear and generator will need housed outside and a coordinated transfer of loads panel-by-panel will need to occur for the overall switchgear replacement. Ties may need to occur at individual tap boxes which serve individual units lighting the runway.

Schedule – AFL Bldg. 605

A project timeline is included below. This timeline reflects estimated date ranges of work to be performed. Actual dates may vary, are non-binding, and are subject to change. The below critical items are required from MDC to move forward in each phase of the project construction timeline.

Milestone	Week(s)
Signed Agreement / PO Issued	1
Procurement - Public Notice	2 - 6
Procurement - Engineering Services	6 - 8
Selection - Engineering Services	9 - 10
Engineering Phase	10 - 18
Start Procurement - Equipment & Services	16 - 22
Selection - Equipment & Services	22 - 23
Permit Submittal	22
Long Lead Sourcing / Planning / Permit Acceptance	23 - 75
Start Construction	78
Ground work	78 - 88
Generator & Switchgear Delivery	89 - 92
Critical Event - Cutover #1 - A Side	93
Critical Event - Cutover #2 - B Side	94
Final System Commissioning / Closeout	95 - 96
Contingency	97 - 104

Performance Bonds

Single instrument Payment and Performance Bonds will be obtained for each construction project. These bonds will remain in effect for six months following construction operation date. Fees related to bond costs will be determined based on specific project requirements and risks and will be passed on to MDC at FPL cost in each applicable statement of work as part of the service fees thereunder.

Responsibility Matrix

FPL is responsible for design and proposal of backup power solutions and distribution-related service upgrades. Various departments within FPL will be involved throughout the project. Similarly, MDC has identified departments to be involved in certain key processes. A listing of the departments involved is included below.

	FPL	Miami-Dade
Technical Feasibility		
Equipment designs	Engineering & Construction (E&C)	MDAD
Service upgrades	Power Delivery (PD)	MDAD
Installation Analysis		
Agreement & SOW	Development, Legal	RER, MDAD
Procurement	E&C, Sourcing	MDAD, RER
Permitting	E&C	RER, MDAD, City of Miami
Inspections	E&C	RER, MDAD, City of Miami
Flood Zones	E&C	MDAD, RER
Sea Level Rising	E&C	MDAD, RER
Tree Removal Impacts	E&C	RER, MDAD
System designs	E&C	MDAD, RER
Service upgrades	PD	MDAD
Account set-up	Development, Customer Service	MDAD

Technical and Construction Feasibility – AFL Bldg. 605

The AFL Building 605 systems represent critical systems to upgrade and modernize due to 24/7 operational requirements, age of the existing equipment, lighting load, and airside/landside equipment placement.

No new space is required for new switchgear and generator placement. New equipment will be installed where existing equipment is housed. Modern NEC requirements will be adhered to.

The generator replacements will require replacement/modernization of the existing day tanks and all associated plumbing. Associated replacement activity is not expected to require new permanent space. Temporary equipment during construction will require some space and temporary provisions and coordination with vested parties.

Numerous unknowns exist underground, and existing conduits may not be suitable for reuse (high potential for collapsed conduit).

The type of mechanical equipment contemplated are considered fixtures within a building, and the scope does not trigger additional requirements for other building upgrades to adhere to LEED Silver Certification. LEED certification is not in-scope for Bldg. 605 electrical system upgrades.

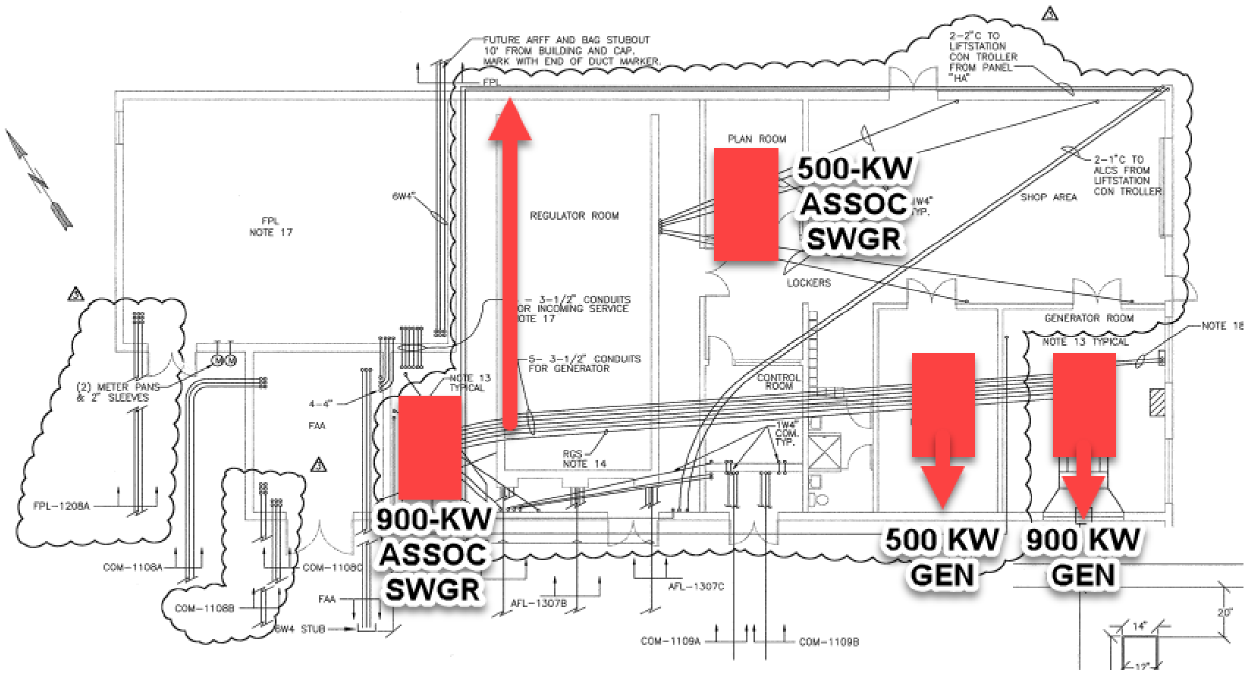


Figure 19 – Basic Layout Location of Equipment in BLDG 605 and general route of motion.

Permit Applications and Inspections – AFL Bldg. 605

Permits are required for all electrical work per Florida Building Code, Miami-Dade County Code, and City of Miami code enforcement. All applicable codes will be adhered too and formalized in the design stage of the project by the Engineer of Record (EOR).

Engineering Services – AFL Bldg. 605

No engineering services have been utilized in recent history to FPL's understanding to address the electrical system at Bldg. 605. As part of this project, we will follow the county's process for obtaining bids, selecting a contractor, and obtaining necessary drawings for the project's scope.

Financial Feasibility – AFL Bldg. 605

The OSPS Backup Generator Monthly Service Payment for Bldg. 605 is estimated based on pre-survey design and prior to equipment purchase and installation. As stated in the Statement of Work (SOW), actual costs are estimated as a range for rough-order-of-magnitude planning and approval. The actual cost will be based on 100% permit approved design and competitive bidding, based on concept developed in this feasibility report. The monthly service payment is for 20yrs, fixed, and includes all maintenance, break/fix, and emergency support costs per the SOW. The monthly payment goes on the utility bill and starts after the system is fully commissioned, helping MDC delay capital expenditures.

OSPS Monthly Service Payment

AFL Bldg. 605	Monthly Service Payment
High Estimate	$114,267
Low Estimate	$85,700

No net change to fuel usage is expected as part of this project work.

- The new generator system will test and operate similarly as the existing in place.
- Fuel costs are the only variable cost that will continue to be paid by MDC.

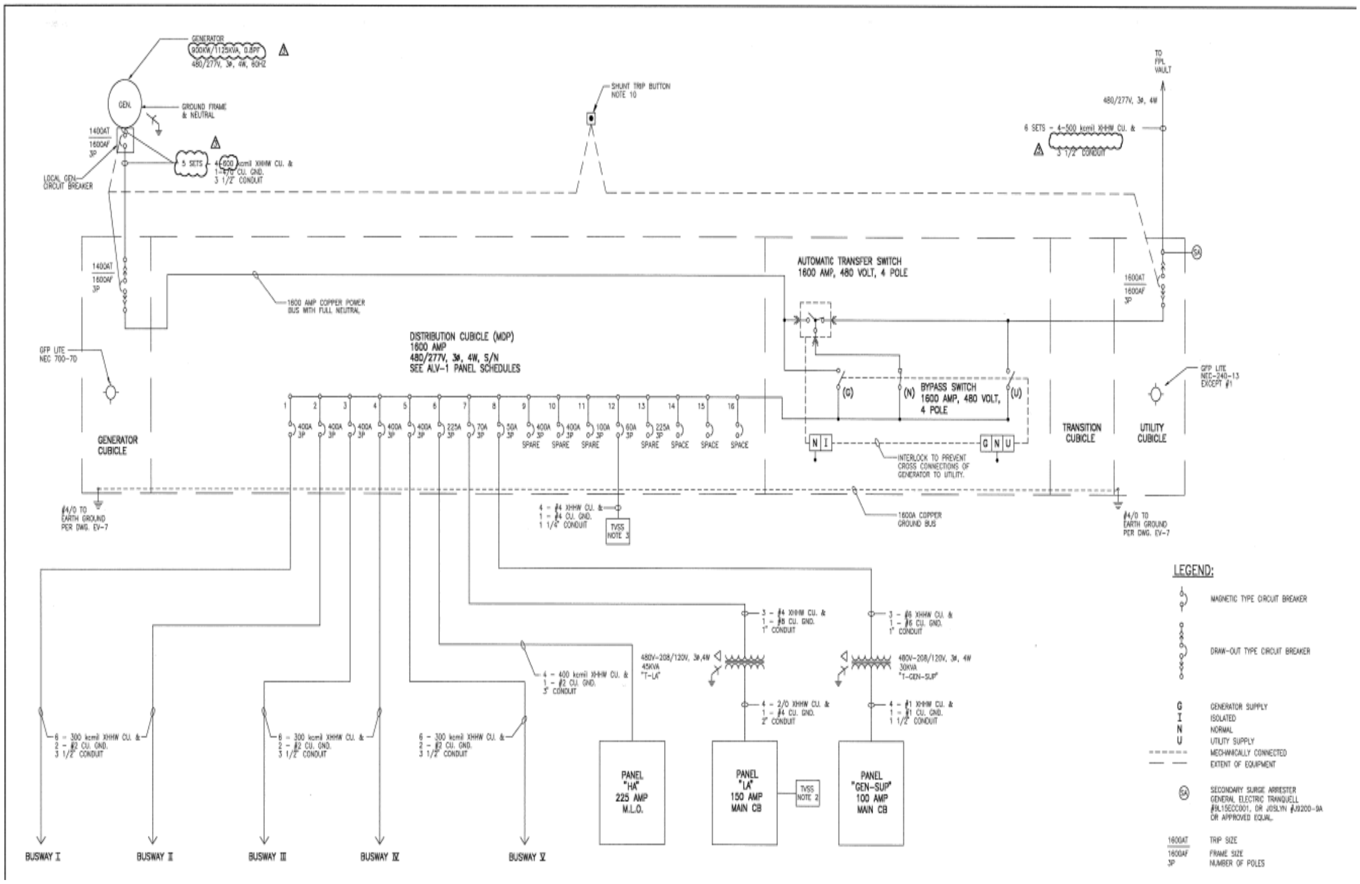
No net change to electrical consumption is expected as part of this project work.

- The new generator system is emergency backup only. It does not provide baseload support.

Conclusion and Recommendations – AFL Bldg. 605

FPL recommends immediate replacement and modernization of the aging electrical infrastructure at MIA AFL Bldg. 605. Should the County proceed with a Non-Residential Backup Power Services Agreement and corresponding Statement of Work with FPL for the identified work by February 2026, FPL is prepared to support construction and installation of the equipment to be operational in 2028.

Appendix – System Drawings – AFL Bldg. 605



ELECTRICAL DATA	480/277V,3Ø,4W	PANEL	"HA"	FULL NEUTRAL	☒
PANEL TYPE	WESTINGHOUSE	MAIN	225A M.L.O.	GROUND BUS	☒
MOUNTING	SURFACE			HINGE DOOR	☒
				KEY DOOR LATCH	☒

IDENTIFICATION	KVA	COND SIZE	WIRE SIZE AWG	AMPS TRIP C.B.	CIR NO	PHASE A B C	CIR NO	AMPS TRIP C.B.	WIRE SIZE AWG	COND SIZE	KVA	IDENTIFICATION
EXTERIOR LIGHTING	3.19	3/4"	#12	20	1		2	20				SPARE
REGULATOR ROOM AND SHOP AREA LIGHTING	3.38	3/4"	#12	20	3		4	20				SPARE
					5		6	20				FAA ROOM LIGHTING
SPARE				20	7		8					
SPARE				50	9		10	15 HACR	#10	1"	3.9	AHU-#1
STORAGE/GEN. ROOM BATH ROOM/COMPUTER				30	11		12					
SPARE				20	13		14					
					15		16	20 HACR	#8	1"	8	A/C COMP. UNIT #2
A/C COMP. UNIT #1	20	1"	#6	45 HACR	17		18					
					19		20					
					21		22	15 HACR	#10	1"	1.2	AHU-#2
LIFT STATION	14	2"	#6	30	23		24					
					25		26					
SPARE					27		28	70	#6	1"	23	AIR COMPRESSOR
REG. ROOM LIGHTS					29		30					
SPARE					31		32					SPARE
SPARE					33		34					SPARE
SPARE					35		36					SPARE
TOTAL	44.42										37	TOTAL

COPPER BUS, BOLT ON BREAKERS

TOTAL CONNECTED KVA 82.0
TOTAL DEMAND KVA 82.0

ELECTRICAL DATA	208/120V,3Ø,4W	PANEL	"LA"	FULL NEUTRAL	☒
PANEL TYPE	WESTINGHOUSE	MAIN	150 AMP MAIN CIR BKR	GROUND BUS	☒
MOUNTING	SURFACE			HINGE DOOR	☒
				KEY DOOR LATCH	☒

IDENTIFICATION	KVA	COND SIZE	WIRE SIZE AWG	AMPS TRIP C.B.	CIR NO	PHASE A B C	CIR NO	AMPS TRIP C.B.	WIRE SIZE AWG	COND SIZE	KVA	IDENTIFICATION
SOUTH MAINT. AREA	1.1	3/4"	#12	20	1		2	20	#12	3/4"	1	PARTS ROOM
NORTH MAINT. AREA	1.1	3/4"	#12	20	3		4	20	#12	3/4"	1.1	GEN. ROOM
					5		6	20	#12	3/4"	1.1	REGULATOR ROOM
BATH/LOCK AREA	1	3/4"	#12	20	7		8	20	#12	3/4"	1	PANEL ROOM
SPARE				20	9		10	20				SPARE
SPARE				20	11		12	20	#12	3/4"	0.8	DRINKING FOUNTAIN
EXHAUST FAN	1	3/4"	#12	20	13		14	20				FILM-FAA
SPARE				20	15		16	20				OUTLET MODEM BX
					17		18	20	#12	3/4"	1	FIRE ALARM
					19		20	20				SPARE
					21		22	20	#12	3/4"	1	DOOR MOTOR
SPARE 2 POLE	2	3/4"	#12	30	23		24					
					25		26	30	#8	3/4"	4.5	WATER HEATER
MAINT.COMPUTER UPS	2	3/4"	#12	20	27		28					
					29		30					SPARE
SPARE 2 POLE				20	31		32					SPARE
					33		34					SPARE
					35		36					SPARE
SPARE				20	37		38					
SPARE				20	39		40	60	#4	1 1/4"	0.1	TVSS
SPARE				20	41		42					
TOTAL	10.7										12.0	TOTAL

COPPER BUS, BOLT ON BREAKERS

TOTAL CONNECTED KVA 23
TOTAL DEMAND KVA 19

SWITCHBOARD "MDP" SCHEDULE

1600 AMP, 480/277 VOLT, 3Ø, 4 WIRE, M.L.O. AND FULL GROUND BUS

CIRCUIT	DESIGNATION	C.B. SIZE TRIP	FRAME RATING	A.I.C. RATING	CONN / DEM	FUTURE
1	BUSWAY I	400A 3P	400A	65,000	106.2 / 133	100KVA
2	BUSWAY II	400A 3P	400A	65,000	98.94 / 124	30KVA
3	BUSWAY III	400A 3P	400A	65,000	127.24 / 160	22.5KVA
4	BUSWAY IV	400A 3P	400A	65,000	29.35 / 37	7.5KVA
5	BUSWAY V	400A 3P	400A	65,000	51.22 / 64	40KVA
6	PANEL "HA"	225A 3P	250A	65,000	82 / 66	
7	PANEL "T-LA" TRANSFORMER	70A 3P	100A	65,000	23 / 19	
8	PANEL "GEN-SUP" TRANSFORMER	50A 3P	100A	65,000	12 / 12	
9	SPARE	400A 3P	400A	65,000		
10	SPARE	400A 3P	400A	65,000		
11	SPARE	100A 3P	250A	65,000		
12	TVSS	60A 3P	100A	65,000	0.1	
13	SPARE	225A 3P	250A	65,000		
14	SPACE			65,000		
15	SPACE			65,000		
16	SPACE			65,000		
				SUBTOTAL	530.05 / 615	200
				TOTAL		815 KVA

ELECTRICAL DATA	208/120V,3Ø,4W	PANEL	"GEN SUP"	FULL NEUTRAL	☒
PANEL TYPE	WESTINGHOUSE	MAIN	100 AMP MAIN CIR BKR	GROUND BUS	☒
MOUNTING	SURFACE			HINGE DOOR	☒
				KEY DOOR LATCH	☒

IDENTIFICATION	KVA	COND SIZE	WIRE SIZE AWG	AMPS TRIP C.B.	CIR NO	PHASE A B C	CIR NO	AMPS TRIP C.B.	WIRE SIZE AWG	COND SIZE	KVA	IDENTIFICATION
DAY TANK	1.75	1"	#8	25	1		2	30	#8	3/4"	2.1	GED-THERM
BATTERY CHARGER	1.5	3/4"	#12	20	3		4					
PNEUMERCATOR PANEL	0.5	3/4"	#12	20	5		6	40	#8	3/4"	6KW	ENGINE WATER HEATER
SPARE					7		8					
GEN RUN LIGHTS					9		10					
					11		12					
					13		14					
					15		16					
					17		18					
					19		20					
					21		22					
					23		24					
TOTAL	3.75										8.1	TOTAL

TOTAL CONNECTED KVA 11.85

COPPER BUS, BOLT ON CIRCUIT BREAKERS

FPL Services™

BUSWAY I SCHEDULE

BUS DUCT NUMBER	CB	LOAD SERVED	CCR KW/STEP	CB SIZE 3 POLE 480V	WIRE SIZE # AWG	FLEX SIZE	CONNECTED PHASES A	B	C	KVA	FORMER CCR
I	1	9LED	30/5	70 AMP	2 – #4 XHHW CU. & 1 – #4 CU. GND	1"	X	X		16.61	9L-EDGE (O)
I	2	9LEE	20/5	70 AMP	2 – #4 XHHW CU. & 1 – #4 CU. GND	1"	X	X		16.49	9L-EDGE (E)
I	3	9LTDZ1	30/5	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"		X	X	13.22	9L-TDZ-1
I	4	9LTDZ2	15/5	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"		X	X	13.22	9L-TDZ-2
I	5	9LC1	30/5	70 AMP	2 – #4 XHHW CU. & 1 – #4 CU. GND	1"	X		X	15.2	9L-C/L-1
I	6	9LC2	20/5	70 AMP	2 – #4 XHHW CU. & 1 – #4 CU. GND	1"		X	X	12.98	27R-C/L-2
I	7	9LWW1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	2.57	–
I	8	9LS1	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"	X		X	15.91	–
I	9	HSBA	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X	X		–	–
I	10	HSBB	30/5	100 AMP	2 – #2 XHHW CU. & 1 – #2 CU. GND	1 1/4"	X	X		–	–
I	11	HSBC	30/5	100 AMP	2 – #2 XHHW CU. & 1 – #2 CU. GND	1 1/4"	X		X	–	–
I	12	HSBD	30/5	100 AMP	2 – #2 XHHW CU. & 1 – #2 CU. GND	1 1/4"		X	X	–	–
		TOTALS:	DEMAND KVA = 133				33.39	36.26	36.55	106.20	

BUSWAY II SCHEDULE

BUS DUCT NUMBER	CB	LOAD SERVED	CCR KW/STEP	CB SIZE 3 POLE 480V	WIRE SIZE # AWG	FLEX SIZE	CONNECTED PHASES A	B	C	KVA	FORMER CCR
II	1	9LT01	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"		X	X	8.3	T26
II	2	27RT01	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		6.32	T30
II	3	ME1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	2.92	T31
II	4	ME2	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X		X	7.84	T7A
II	5	MC1	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X		X	9.71	T32
II	6	MC2	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X	X		9.12	T25
II	7	MC3	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"		X	X	9.82	T28
II	8	MS1	15/5	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"	X	X		13.92	–
II	9	LE1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	2.57	T33
II	10	LE2	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	5.38	T8B
II	11	LE3	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	6.9	T35
II	12	LS1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	7.13	–
II	13	FUTURE	7.5/3	7.5/3	–	–		X	X	–	–
II	14	UC1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	4.68	T24
II	15	HSBF	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	–	–
II	16	UE1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		4.33	T24
II	17	HSBG	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	–	–
II	18	HSBH	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		–	–
		TOTALS:	DEMAND KVA = 124				33.16	33.16	32.62	98.94	

BUSWAY III SCHEDULE

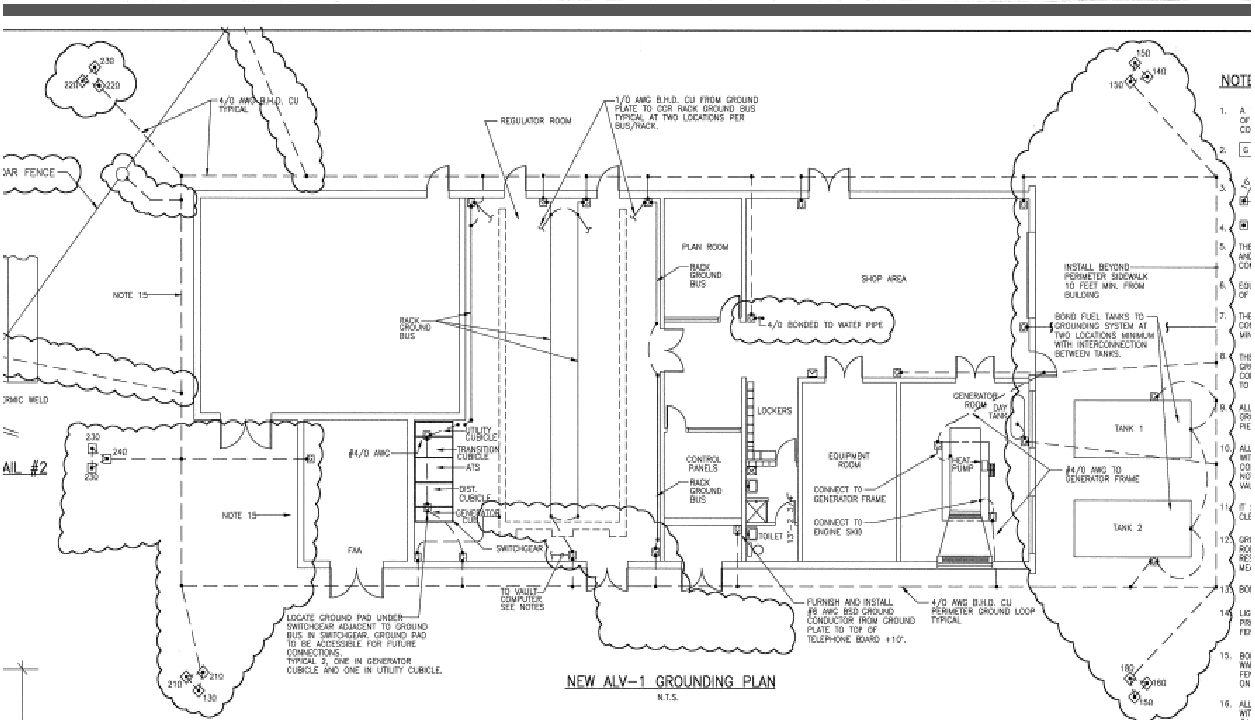
BUS DUCT NUMBER	CB	LOAD SERVED	CCR KW/STEP	CB SIZE 3 POLE 480V	WIRE SIZE # AWG	FLEX SIZE	CONNECTED PHASES A	B	C	KVA	FORMER CCR
III	1	NE1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	6.32	T17N
III	2	NE2	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		5.96	T20
III	3	NC1	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"	X	X		13.22	T16N
III	4	NC2	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"		X	X	13.68	T22
III	5	NC3	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"	X		X	12.63	T23
III	6	NS1	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X		X	8.77	–
III	7	HSBI	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		–	–
III	8	HSBJ	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	–	–
III	9	12T02	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"	X	X		11.81	T5N
III	10	30T01	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"		X	X	8.77	T13N
III	11	QE1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	3.86	T18
III	12	QE2	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	5.96	T15
III	13	QE3	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		5.85	T3
III	14	QC1	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X		X	9.01	T9N
III	15	QC2	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"	X		X	8.54	T14
III	16	QC3	10/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		4.21	T1
III	17	HSBS	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	–	–
III	18	QS1	10/3	35 AMP	2 – #8 XHHW CU. & 1 – #8 CU. GND	3/4"		X	X	8.65	–
		TOTALS:	DEMAND KVA = 160				43.16	40.99	43.09	127.24	

BUSWAY IV SCHEDULE

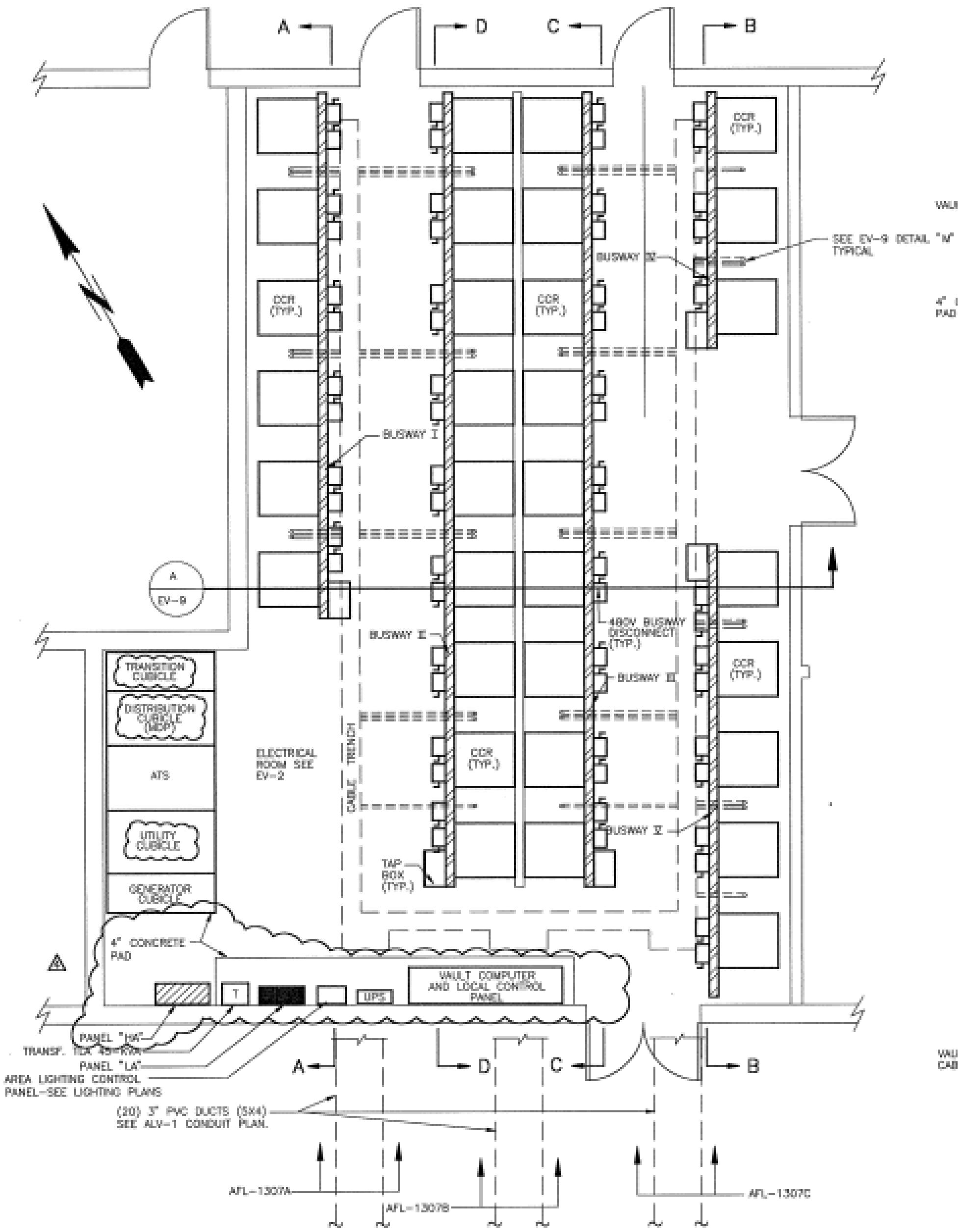
BUS DUCT NUMBER	CB	LOAD SERVED	CCR KW/STEP	CB SIZE 3 POLE 480V	WIRE SIZE # AWG	FLEX SIZE	CONNECTED PHASES A	B	C	KVA	FORMER CCR
IV	1	WE1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	1.75	T20
IV	2	WC1	20/3	70 AMP	2 – #4 XHHW CU. & 1 – #4 CU. GND	1"		X	X	16.37	T19
IV	3	WS1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		4.21	–
IV	4	APRONEC	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		7.02	T21
IV	5	HSBT	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		–	–
IV	6	FUTURE	7.5/3	–	–	–	X		X	–	–
		TOTALS:	DEMAND KVA = 52				6.49	13.8	9.06	29.35	

BUSWAY V SCHEDULE

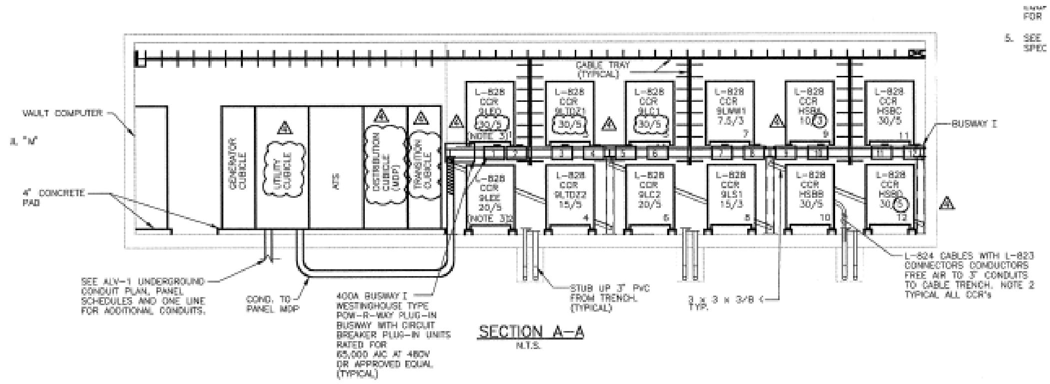
BUS DUCT NUMBER	CB	LOAD SERVED	CCR KW	CB SIZE 3 POLE 480V	WIRE SIZE # AWG	FLEX SIZE	CONNECTED PHASES A	B	C	DEM KW	FORMER CCR
V	1	FUTURE	30/3	–	–	–	X	X		–	–
V	2	FUTURE	7.5/3	–	–	–		X	X	–	–
V	3	PE1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		3.63	T11A
V	4	PE2	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"		X	X	3.27	T6N
V	5	PE3	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	2.22	T10N
V	6	PC1	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"	X		X	12.51	T12
V	7	PC2	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		5.38	T4
V	8	PC3	15/3	50 AMP	2 – #6 XHHW CU. & 1 – #6 CU. GND	1"		X	X	13.68	T2N
V	9	PS1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X	X		6.9	–
V	10	JJC1	7.5/3	25 AMP	2 – #10 XHHW CU. & 1 – #10 CU. GND	3/4"	X		X	3.63	–
		TOTALS:	DEMAND KVA = 60				17.13	16.43	17.66	51.22	



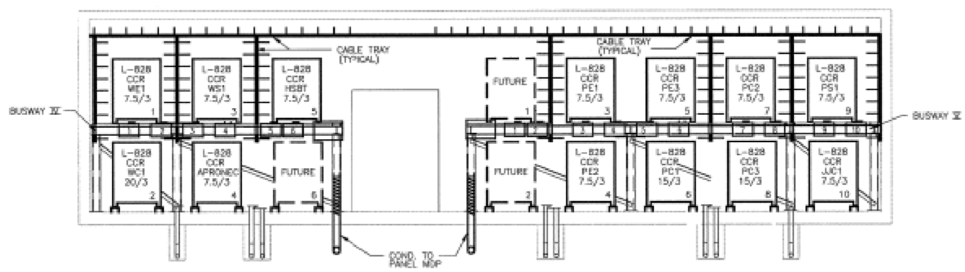
NEW ALV-1 GROUNDING PLAN
N.T.S.



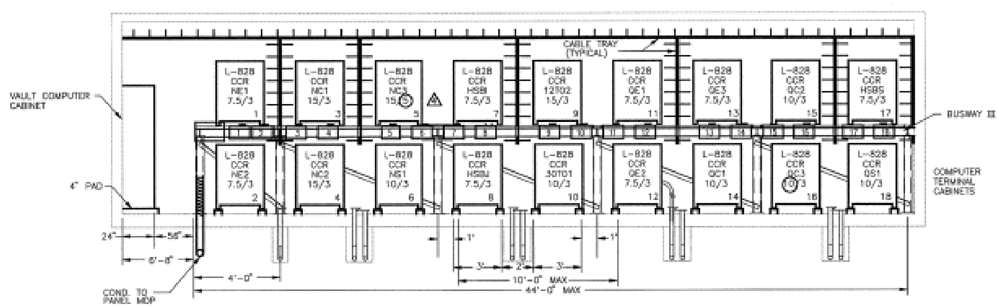
NEW ALV-1 REGULATOR ROOM EQUIPMENT LAYOUT



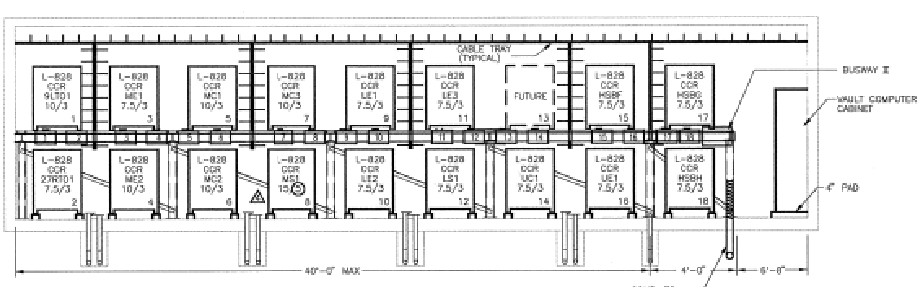
SECTION A–A
N.T.S.



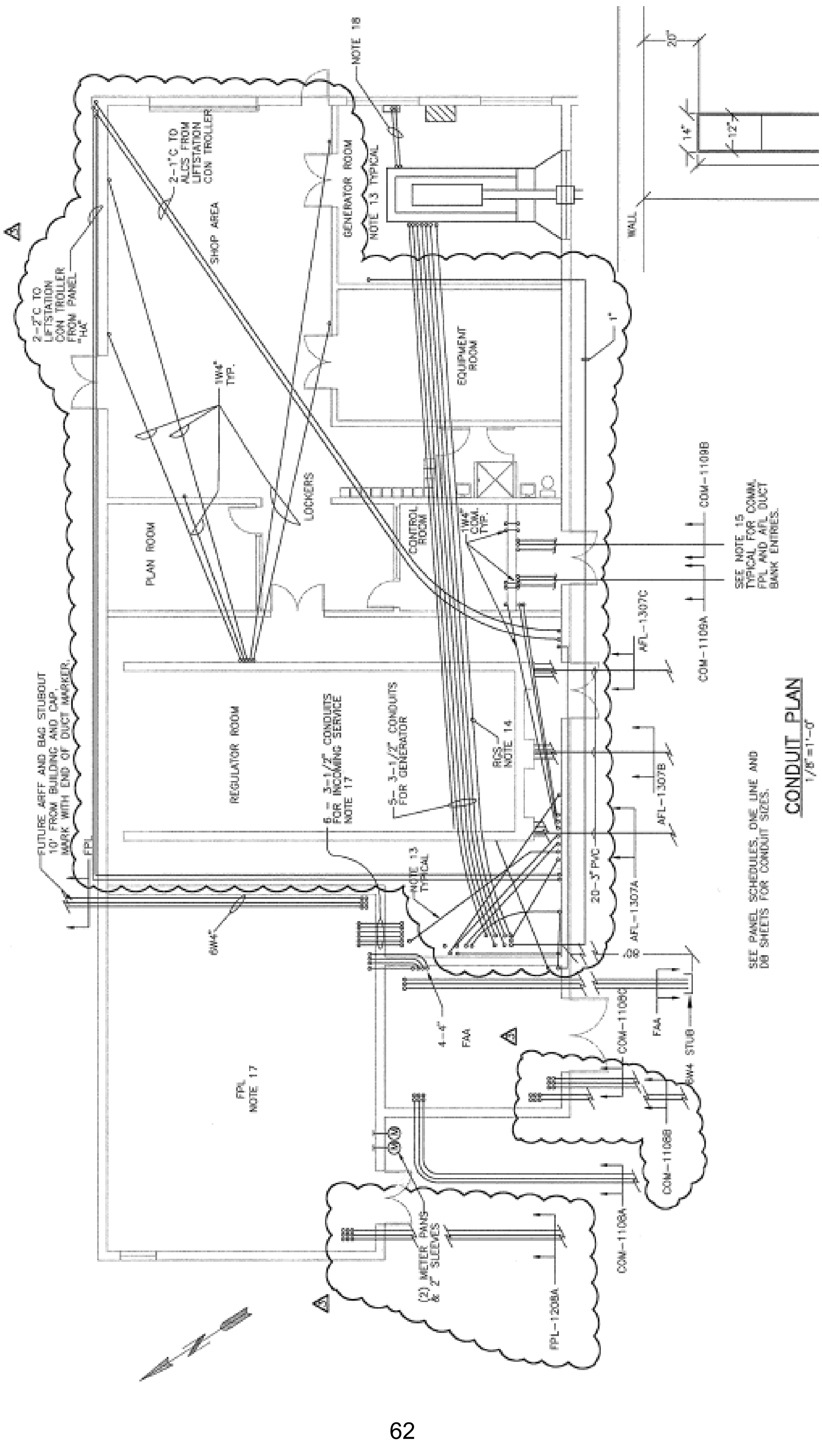
SECTION B–B
N.T.S.



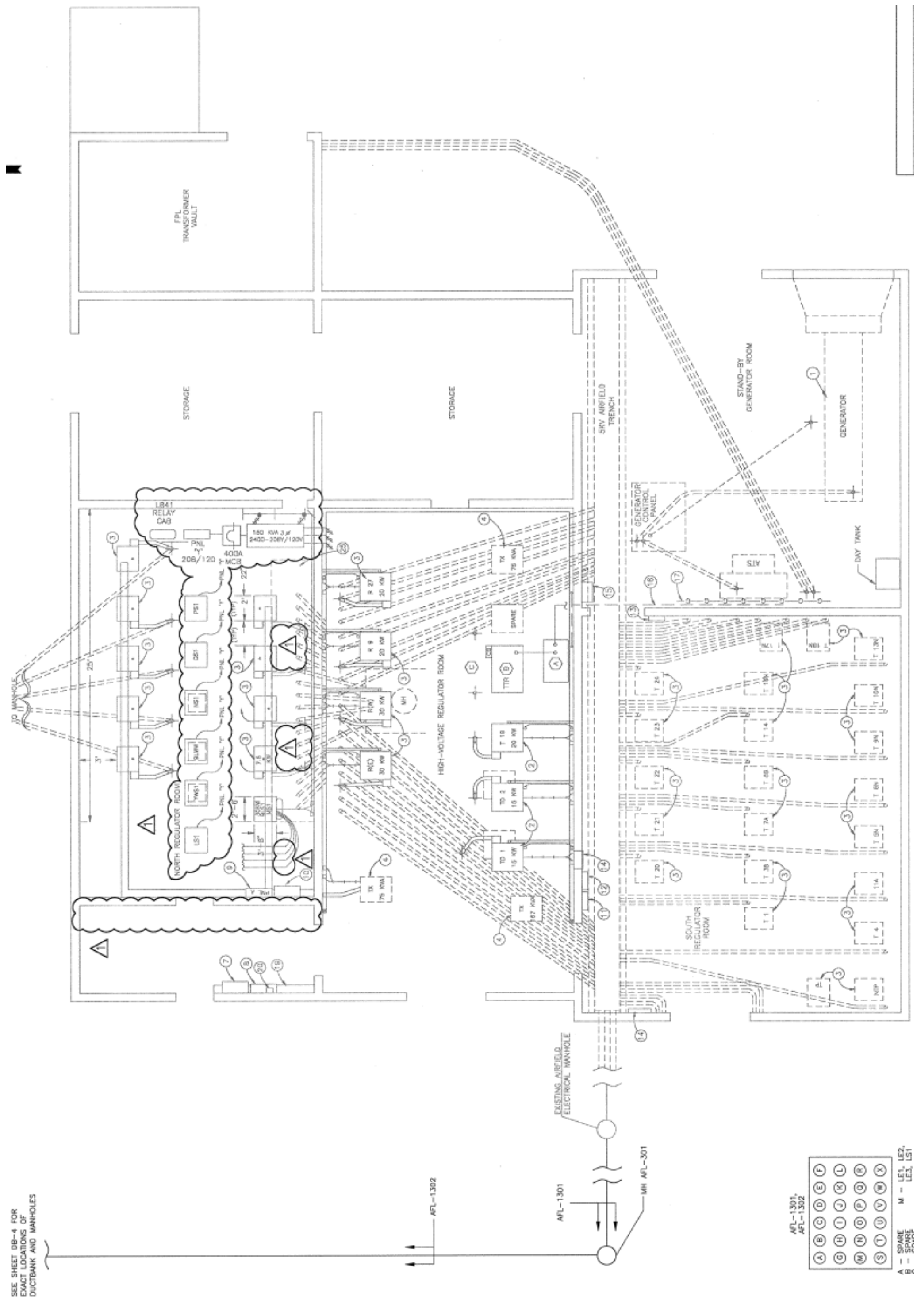
SECTION C–C
N.T.S.

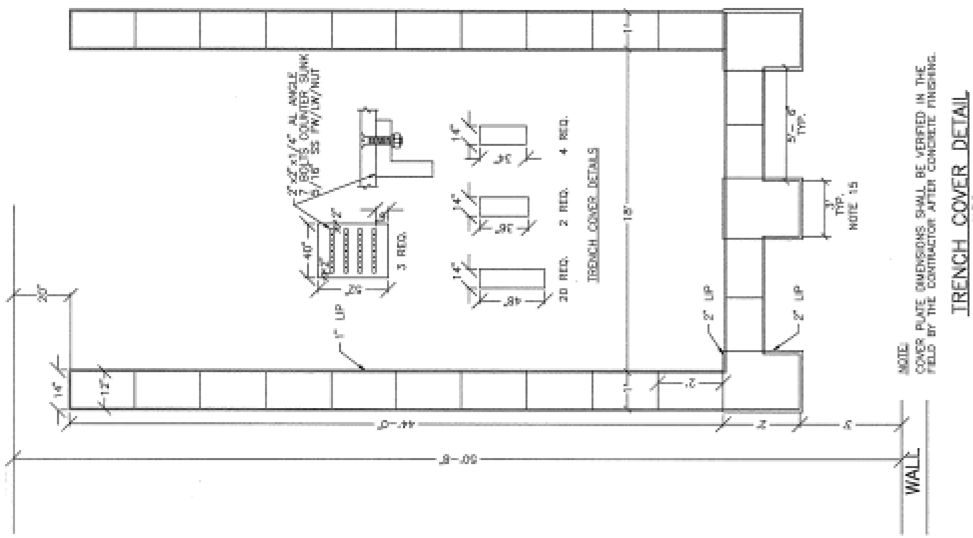


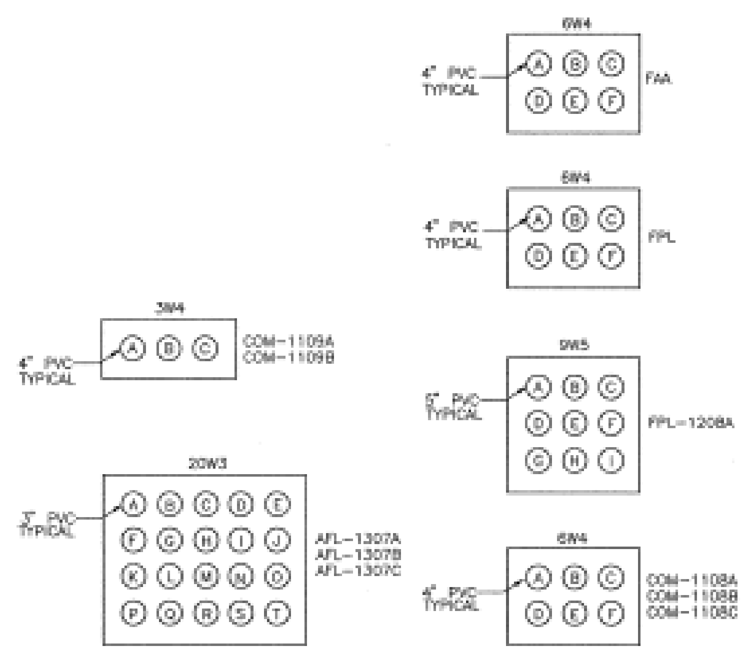
SECTION D–D
N.T.S.


CONDUIT PLAN
1/8"=1'-0"
SEE PANEL SCHEDULES, ONE LINE AND DB SHEETS FOR CONDUIT SIZES.
SEE NOTE 15 TYPICAL FOR COMM, FPL AND AFL DUCT BANK ENTRIES.
REGULATOR ROOM
PLAN ROOM
SHOP AREA
EQUIPMENT ROOM
GENERATOR ROOM
CONTROL ROOM
LOCKERS
FPL
NOTE 17
WALL

MDC088


FPL TRANSFORMER VAULT
STORAGE
STORAGE
5KV AIRFIELD TRENCH
STAND-BY GENERATOR ROOM
GENERATOR
GENERATOR CONTROL PANEL
DAY TANK
ATS
L841 RELAY CAB
NORTH REGULATOR ROOM
HIGH-VOLTAGE REGULATOR ROOM
SOUTH REGULATOR ROOM
EXISTING AIRFIELD ELECTRICAL MANHOLE
TO MANHOLE
SEE SHEET DB-4 FOR EXACT LOCATIONS OF DUCTBANK AND MANHOLES
AFL-1301
AFL-1302
MH AFL-301





DUCT SECTIONS
N.T.S.

NOTE: SEE DB SHEETS FOR ADDITIONAL CABLE LOADING AND DUCT DETAILS.

Terminal H CC H-11/H15 – H1827 (MDAD EG-213)

Project Solution Development – Terminal H

All project work will be executed in a design-bid-build turnkey project, based on estimates and design guidance established in this feasibility report. This feasibility report is concept level based on design guidance previously established and not permit level drawings or detail.

The project description for Terminal H is the end-of-life equipment replacement/modernization of the 480V emergency generator system and main distribution switchgear replacement. The buildout of new indoor switchgear, generator, downstream devices within scope, and related construction will occur in the existing rooms housing existing equipment in 1827 (generator room),1828 (switchgear room), and 1829 (mechanical room). A new above-ground diesel tank will be constructed in open space outside the main entry doors of the electrical/generator room to reduce, minimize, and optimally eliminate issues currently experienced with the existing underground diesel storage system, such as leaks. There is adequate space for this new diesel tank such that disruption to ongoing operations outside is minimized.

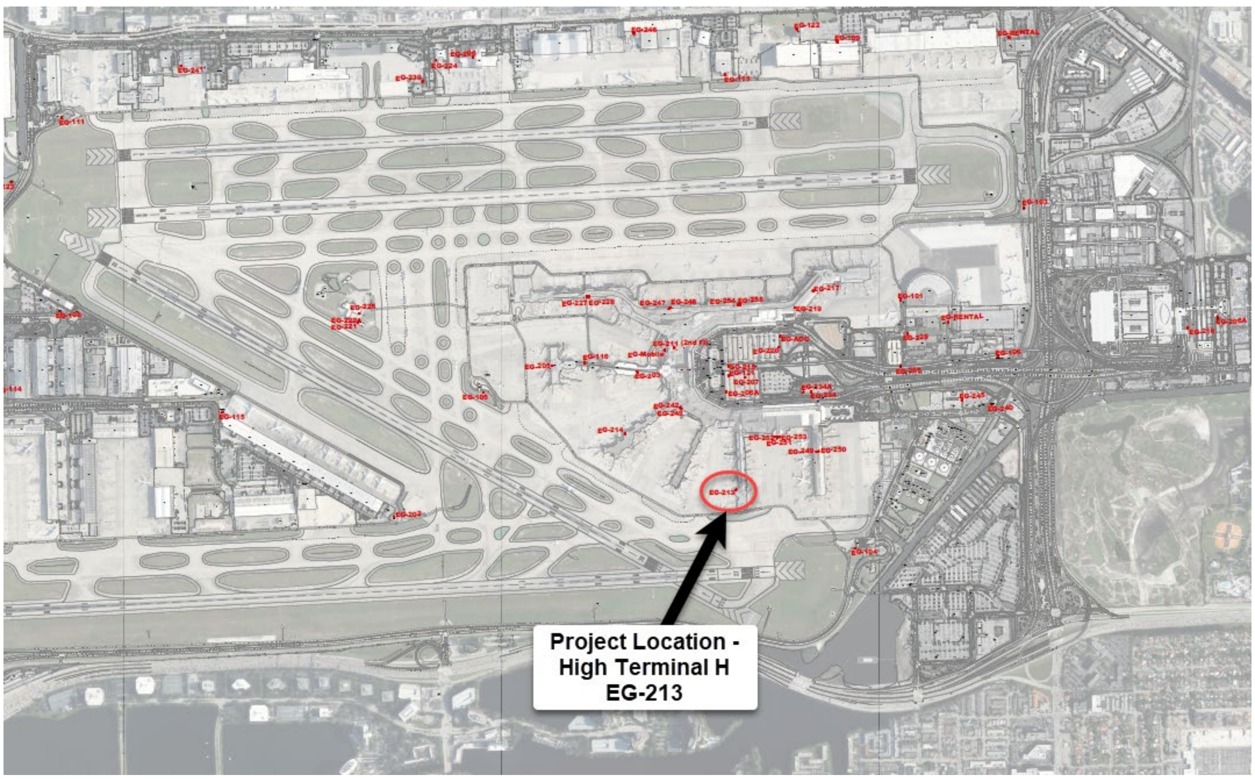


Figure 3.1 - Project Location (Terminal H)

Condition Assessment – Terminal H main electrical/generator rooms

The condition of the existing equipment is *extremely poor – risk to operations*.

- 2yr peak electrical demand, based on meter analysis, is 952KW.
- The spaces are original construction serving several aspects of Terminal H including concourse services, ground operations, and supporting mechanical equipment.
- Major Spaces

- Generator Room 1827
  - The 1MW Onan/Cummins generator is at end-of-life state, now over 30 years in operation. It contains an analog setup with no remote monitoring communication. The generator shows signs of aging, wear and tear, rust, and patched retrofits.
  - The generator contains a 250A panel dedicated to the fire pump on its north side. On its south side, a currently disconnected downstream panel serving a motor generator is attached.
  - The generator is readily accessible in the center of the room along the west exterior wall.
  - The exhaust system points west and out of the building thru the room's concrete wall, in two separate outputs. It splits into dualling exhaust pipes above the generator.
  - The room contains adequate space for construction activity and for equipment replacement
  - The day tank is in the back corner of the room (SW), behind the generator, and needs replaced.
  - The generator's associated piping runs underground from the unit to Switchgear room 1828, located adjacent to the south.
  - The walls of the room are mostly clear (south, east, north). Galvanized piping runs along the middle of the south wall.
- Switchgear Room 1828
  - Generator Room 1827 is located adjacent to the north, the FPL vault is located adjacent to the south, and Mechanical Room 1829 is located to the east - housed behind the room's east door.
  - The room is very tight on space in all aspects and all switchgear equipment needs fully replaced.
  - The room includes a 4000A main distribution switchgear and a 1600A main distribution switchgear. The generator is associated with the 1600A main distribution switchgear, albeit both MDS's will be replaced in this scope.
  - Existing switchgear equipment is GE brand.
  - Upon entering the room from the outside, the 4000A Switchboard Substation #1 is located on the left. This unit includes 4 substation main sections across the top, followed by several breakers located on the device's bottom half. The unit is connected to the FPL vault via overhead bus duct
  - Across the walkway from the 4000A switchboard sits main switchgear #1 rated at 1600A. This device includes several breakers housing active loads, such as a chiller.
  - Adjacent to Switchgear #1 sits Main Switchgear #2 & 3, rated at 4000A. This device includes 4 main sections associated with Switchgear #2 and 2 sections associated with Switchgear #3 across the top, in the same overall unit. The bottom half of the devices includes associated breakers/loads.
  - Across the walkway from Main Switchgear #2 & 3, and adjacent to Switchboard #1 lies the 1600A-rated Switchboard #2. Switchboard #2 includes 4 main sections across the top, hosting multiple hazards. For example, section #2's cables are racked out in the rear and the bus bars are not energized. Breaker Main#2 is racked out. Section #3 has 2 breakers but no loads. These loads are connected to the bottom breaker in Switchgear Substation Main #1 Section #4. And in Section 4, the previous load is now also connected to the bottom breaker in Substation Main #1 Section #4.

- Behind Switchgear Switchboard #2, in the NE corner of the room, sits a 1200A rated switchboard DPMG which is directly connected to the FPL vault and feeds downstream motors. This switchboard is a candidate for replacement.
- Cables and caution tape cover the ground behind Switchgear Subs #1 and #2, representing a significant hazard.
- The room overall is tight on space with roughly 3ft of space between the walls and the back side of the switchgear units. The central walkway is tight, and cables run under the floor. Bus duct from the FPL vault and several iron piping sections run overhead. Some cables run between devices without pipe, and are zip-tied together. The room needs to be completely modernized.
- Louvre double doors are located adjacent to the room's main single door which may prove useful during construction activity.
- A Matterport scan of Switchgear Room 1828 was previously completed which provides dozens of viewpoints and notes on individual devices. This is a comprehensive tool to utilize for site preparation.
- Temporary conductors during construction will run thru the louvres/main electrical room door. Mobile switchgear and generators have adequate space to be housed outdoors for this concept, but coordination needs to occur with nearby airside vehicles.
- The room is noticeably warm, and conditions will be assessed to ensure new electrical equipment is installed in a well-ventilated, temperature-controlled environment.

- Mechanical Room 1829
  - The mechanical room is located behind switchgear 1828. The room contains several end-of-life downstream panels and some remote monitoring equipment. Space in this room could potentially be utilized for electric modernization but would need coordination with MDAD team. There is some unused space in the room, and it is well-cooled.
- Outdoor Space
  - There is space immediately outside the rooms available for construction activity - including equipment movement, vehicles, and staging of temporary equipment. The space is currently utilized by ground support vehicles which would need relocated to allow construction to occur.
  - The area outside the rooms is all asphalt and is located airside along the terminal. Space is limited and extra caution must be taken given airplane traffic in the vicinity.
  - Diesel tank storage system is housed under asphalt. A new system will need constructed above ground beside the buildings. The existing system will need removed along with appropriate remediation activities.
  - Installation of bollards will coincide with protection for the new diesel tank storage system.
  - Terminal H's full scope is within the AOA, with the closest security gate to the east by Perimeter Road.

Figure 3.2 – Existing space outside of generator and electrical rooms.

Figure 2.3 – Frontal view of generator (North side)

Figure 3.4 – Alternative frontal view of generator taken from doors (east wall in back)

Figure 3.5 – Back view of generator (south side)

Figure 3.6 – Diesel day tank in SW corner of generator room

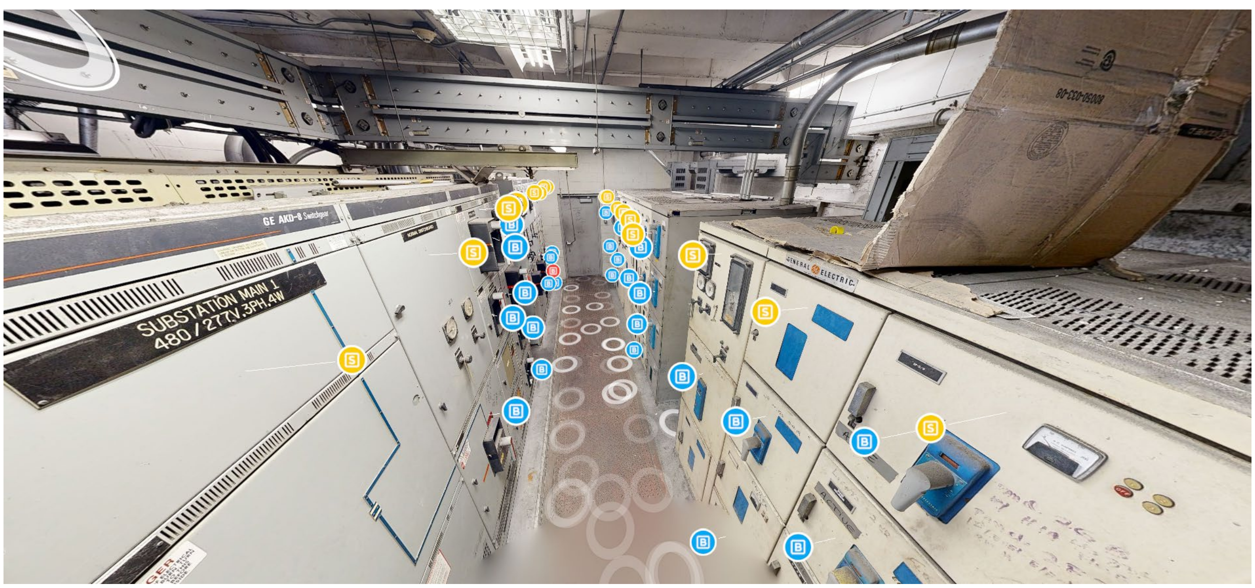


Figure 3.7 – Matterport image of electrical room 1828, taken from front door. Both substation mains and MDS's located along central hallway. Bus duct and piping overhead. Mechanical Room door in rear.

Figure 3.8 – Matterport image of Substation Main #1. 4 main sections across the top. Several panels present including jetway and chiller loads.

Figure 3.9 – Matterport image of MDS #1. Active panels present include loads to interior terminal & chiller.

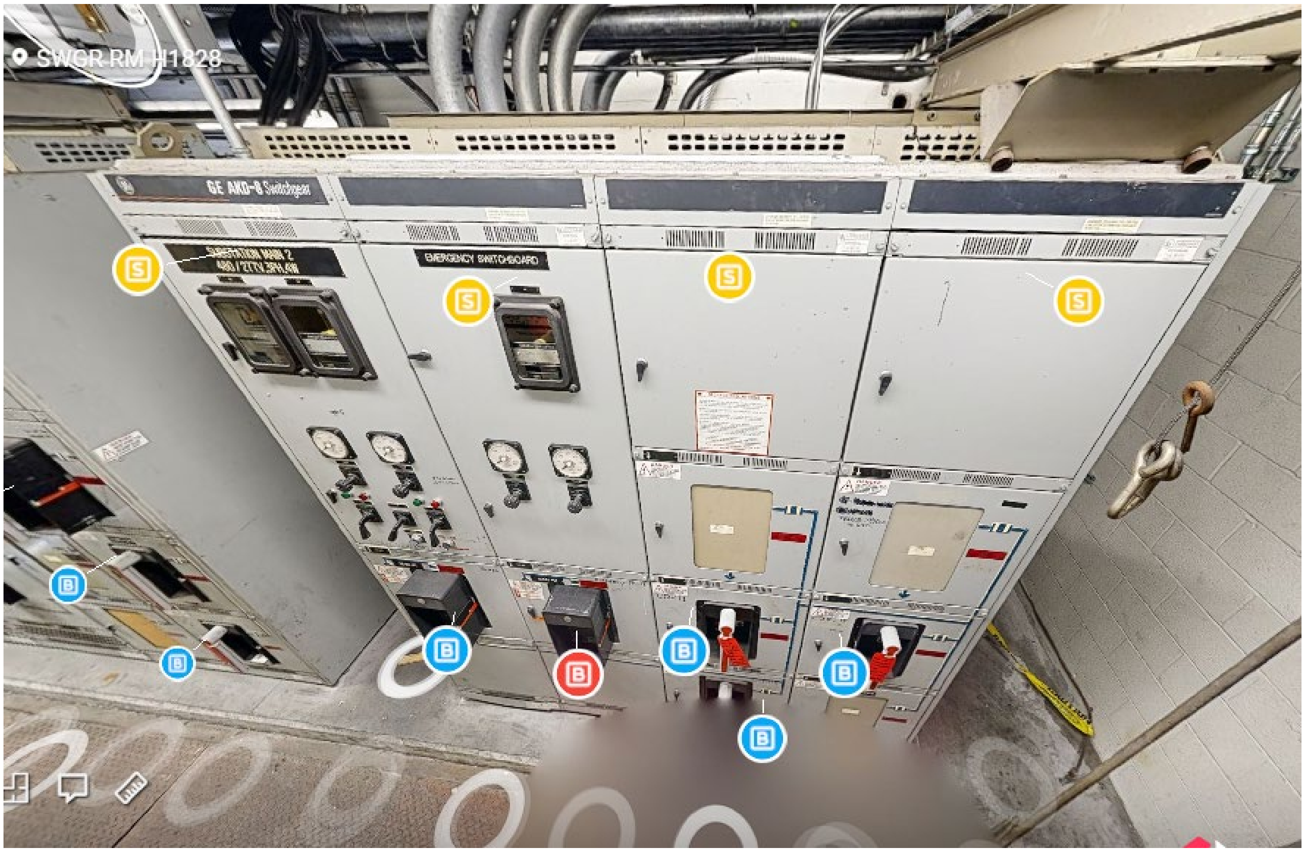


Figure 3.10 – Matterport image of Substation Main #2. Includes 4 main sections across the top, multiple tagged lockouts, and some spare breakers.

Figure 3.11 – Matterport image of MDS#2. Main exterior door to room to left of image. Loads include some H gates.

Figure 3.12 – Matterport Image POV from SE corner. MDS#2 in front. Roughly 3ft clearance between MDS#2 and south wall. Mechanical room door visible on right with Switchboard DPMG in rear right. FPL vault located behind left (south) wall.

Figure 3.13 – Matterport image of Switchboard DPMG, located in NE corner of room. Caution tape and panel boards missing in rear of Substation Main #2, with exposed cable. Take heavy caution.

Figure 3.14 – Matterport image POV from NW corner. Switchboard DPMG, exposed cables, temporary feeder panels, located in rear of Substation Mains #1 and #2. Exterior doors to room on right side of image. Roughly 3ft clearance between Switchboards and left (North) wall.

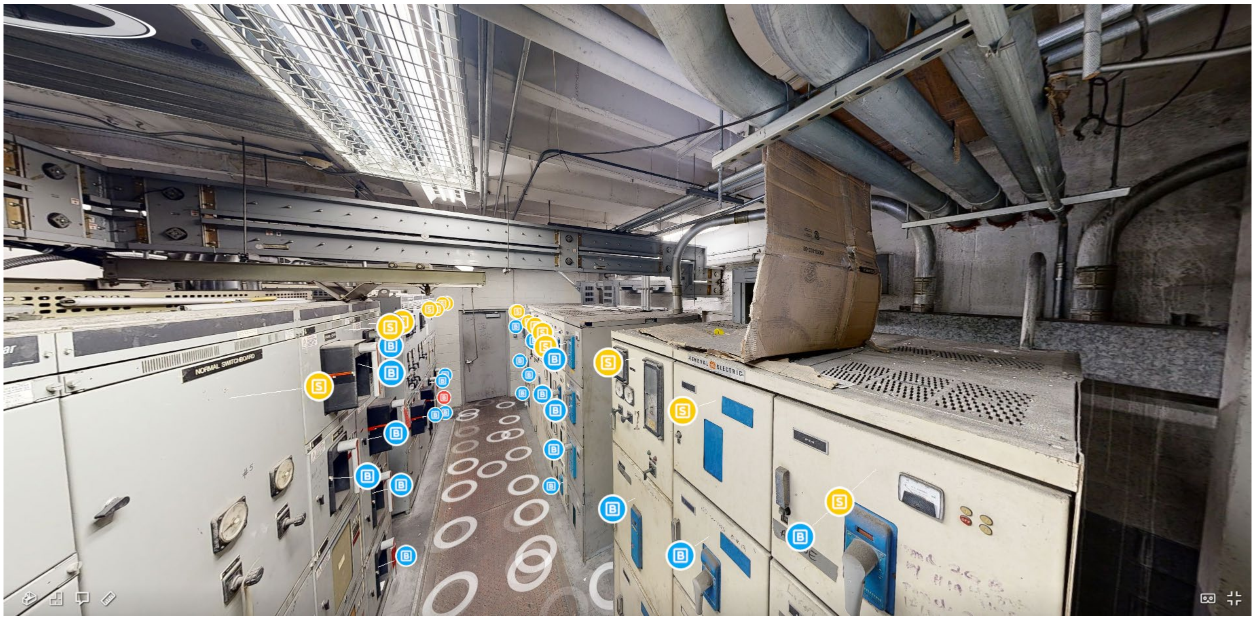


Figure 3.15 – Matterport image of overhead room setup/condition taken from exterior doors, towards south side of the room.

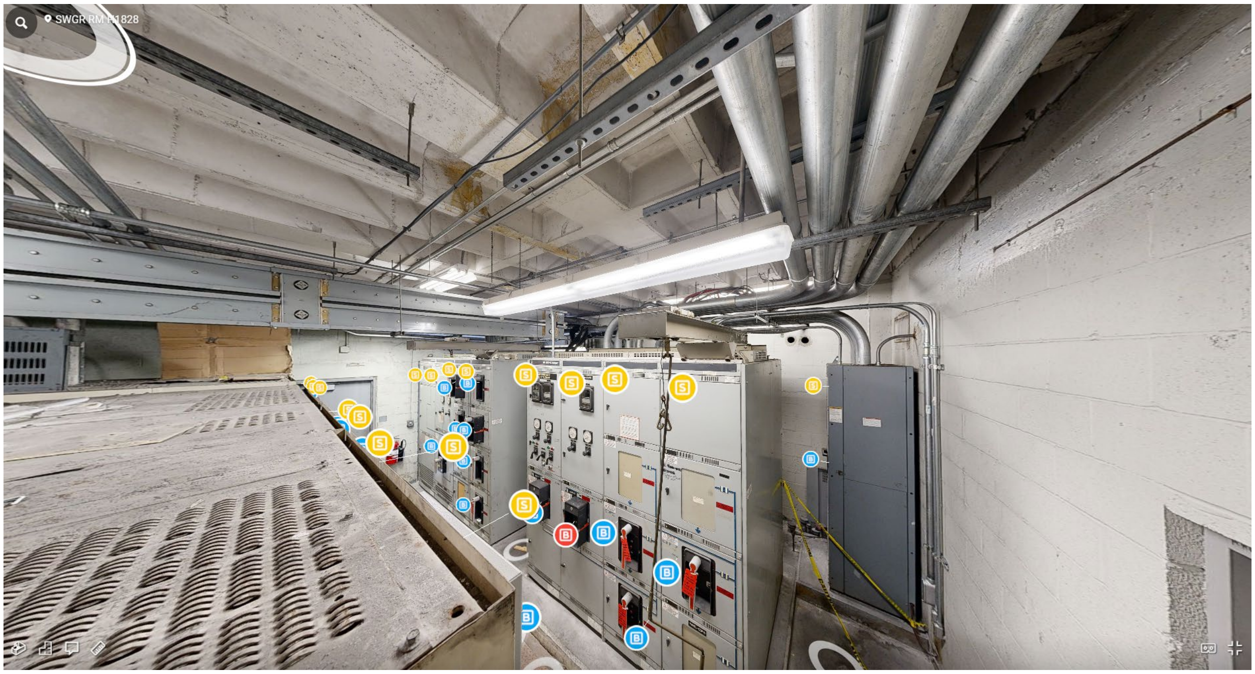


Figure 3.16 – Matterport image of overhead room setup/condition taken from mechanical room doors, towards north side of room.

Figure 3.17 – Underground diesel storage tank location (outside of generator/electrical rooms)

Figure 3.18 – Subpanels in mechanical room 1829

Project Plan – Terminal H

To address the operational risk identified in the condition assessment and incorporating the design concepts for FPL backup generation systems at MIA, the following concept solution is proposed. This solution will be executed in a design-bid-build project plan.

Project Description – Terminal H

Backup power service to provide an alternative source of electrical power and electrical distribution equipment to Terminal H. Based on site installation conditions and electrical load data, Company expects to utilize 952KW of backup generation capacity, controls, and new main distribution switchgear to provide service to the electrical loads, based on the historical 24-month metering data, associated with FPL Account Number 79914-72411. The generator(s) supply emergency life/safety load only.

Scope of Work – Terminal H

See appendix for system drawings. The scope includes all construction and permitting by licensed contractors, per applicable codes.

The new generator system will replace the existing in the same location as a like-for-like replacement. Dueling generator systems were considered but space constraints in the generator room are a strong concern. The new generator system will serve the same electrical system as the existing. All switchgear units will represent a like-for-like replacement. Downstream panels and other switchboards will be replaced like-for-like per need and existing condition.

Electrical System

- (1) 1MW Tier 2 Generator
    - Associated diesel day tank
    - Battery charger and maintainer
- 2 Substation Main Switchgear Units, rated at 4000A and 1600A respectively
    - Modern, high-reliability breakers that meet current electrical codes and safety standards
    - Integrated advanced control & monitoring features to support automatic operation & protective relaying
    - Remote monitoring and command capability
- 2 Main Distribution Switchgear Units, rated at 4000A and 1600A respectively
    - Main-Tie-Main configuration, fully rated
    - PLC platform & controls
    - Integrated transfer functions and load management functionality
        - Coordination with load management and protection schemes
- Emergency MDP replacement
- Remote monitoring
    - Generator system and switchgear
    - Cellular based
- 5000-gallon diesel fuel storage tank
    - Outside, above-ground, adjacent to building
    - Sized appropriately to generator(s)
    - Modern leak detection system
    - Protected by bollards

Building Upgrades

- Removal of existing generators, switchgear, and refurbishment of existing space.
- Insulation improvements to electrical room to improve airflow and temperature regulation.
- Update and modify routing of conduits and existing iron piping to better adhere to standards and improve the general flow/layout.
- Update and modify diesel pipe routing from a newly installed tank into the generator room. Update piping as necessary in and around the generator(s). Install a new fire pump main panel and motor panel as needed in vicinity of the generator(s) to replace the existing, potentially on the rear (east) wall or another area of more open space.

Temporary Power Plan

- A robust temporary power plan is intended and will be evaluated with MDAD during the detailed construction phase of the project.

- Loads will need to be migrated in between devices as switchgear equipment is removed and installed.
- At a minimum, all loads are assumed that brief outages can be planned/coordinated with stakeholders to tie-in temporary equipment. This enables continuous operations while electrical work takes place.
- Temporary equipment can be tied in at an MDS.
- Significant planning will need to occur given the criticality and size of the loads for an active concourse.

Schedule – Terminal H

A project timeline is included below. This timeline reflects estimated date ranges of work to be performed. Actual dates may vary, are non-binding, and are subject to change. The below critical items are required from MDC to move forward in each phase of the project construction timeline.

Milestone	Week(s)
Signed Agreement / PO Issued	1
Procurement - Public Notice	2 - 6
Procurement - Engineering Services	6 - 8
Selection - Engineering Services	9 - 10
Engineering Phase	10 - 18
Start Procurement - Equipment & Services	16 - 22
Selection - Equipment & Services	22 - 23
Permit Submittal	22
Long Lead Sourcing / Planning / Permit Acceptance	23 - 75
Start Construction	78
Ground work / Site Work	78 - 98
Generator Delivery & Gen Switchgear	98-103
Critical Event - Cutover #1 - A Side	104
Critical Event - Cutover #2 - B Side	105
Final System Commissioning / Closeout	106-107
Contingency	107-130

Performance Bonds

Single instrument Payment and Performance Bonds will be obtained for each construction project. These bonds will remain in effect for six months following construction operation date. Fees related to bond costs will be determined based on specific project requirements and risks and will be passed on to MDC at FPL cost in each applicable statement of work as part of the service fees thereunder.

Responsibility Matrix

FPL is responsible for design and proposal of backup power solutions and distribution-related service upgrades. Various departments within FPL will be involved throughout the project. Similarly, MDC has identified departments to be involved in certain key processes. A listing of the departments involved is included below.

	FPL	Miami-Dade
Technical Feasibility		
Equipment designs	Engineering & Construction (E&C)	MDAD
Service upgrades	Power Delivery (PD)	MDAD
Installation Analysis		
Agreement & SOW	Development, Legal	RER, MDAD
Procurement	E&C, Sourcing	MDAD, RER
Permitting	E&C	RER, MDAD, City of Miami
Inspections	E&C	RER, MDAD, City of Miami
Flood Zones	E&C	MDAD, RER
Sea Level Rising	E&C	MDAD, RER
Tree Removal Impacts	E&C	RER, MDAD
System designs	E&C	MDAD, RER
Service upgrades	PD	MDAD
Account set-up	Development, Customer Service	MDAD

Technical and Construction Feasibility – Terminal H

The Terminal H system represents a critical system to upgrade and modernize due to 24/7 operational requirements, age of the existing equipment, lighting load, and airside/landside equipment placement.

No new space is required for new switchgear and generator replacement. New equipment will be re-located where existing equipment is housed. New space is required outside the generator for a new diesel day tank, which is currently concrete parking pavement for airside vehicles. Fueling pumps for the airside vehicles may need to be relocated.

The generator replacement will include removal of the underground diesel tank, adjacent day tank, and all associated plumbing. Placement of tanks and associated bollards will require new permanent space. Temporary equipment during construction will require some space and temporary provisions and coordination with vested parties. Heavy coordination with local grounds personnel is necessary due to gate activity in vicinity.

Numerous unknowns exist underground, such as condition of existing underground diesel system, and gasoline infrastructure for nearby gas pumps.

The type of mechanical equipment contemplated does not trigger additional requirements for other building upgrades to adhere to LEED Silver Certification. LEED certification is not in-scope for Terminal H system upgrades.

Figure 3.19 – Location of rooms of concern with respect to Terminal H's general vicinity

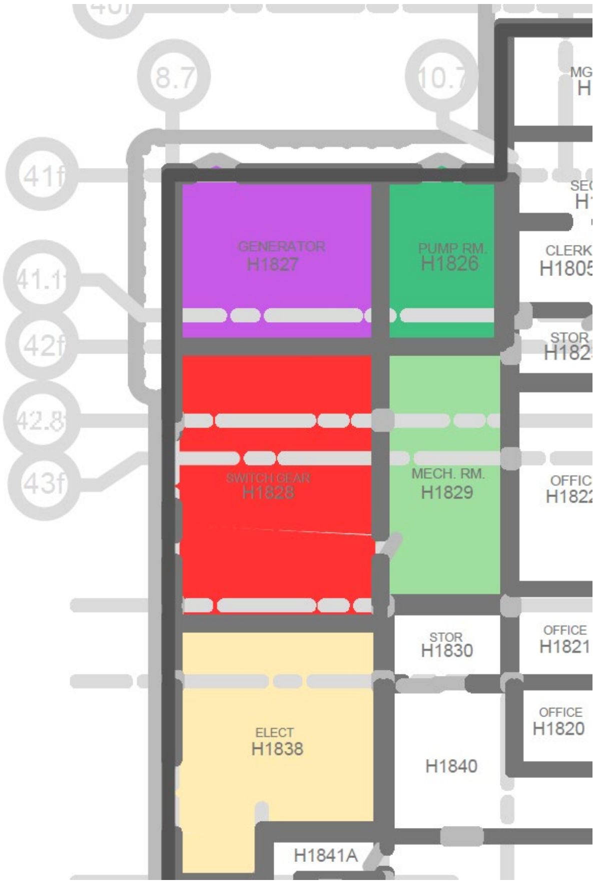


Figure 3.20 – Utility room location(s). H1838 is the FPL vault.

Permit Applications and Inspections – Terminal H

Permits are required for all electrical work per Florida Building Code, Miami-Dade County Code, and City of Miami code enforcement. All applicable codes will be adhered too and formalized in the design stage of the project by the Engineer of Record (EOR).

Engineering Services – Terminal H

No engineering services have been utilized in recent history to FPL's understanding to address the electrical systems in H1827, H1828, H1829. As part of this project, we will follow the county's process for obtaining bids, selecting a contractor, and obtaining necessary drawings for the project's scope.

Financial Feasibility – Terminal H

The OSPS Backup Generator Monthly Service Payment for Terminal H is estimated based on pre-survey design and prior to equipment purchase and installation. As stated in the Statement of Work (SOW), actual costs are estimated as a range for rough-order-of-magnitude planning and approval. The actual cost will be based on 100% permit approved design and competitive bidding, based on concept developed in this feasibility report. The monthly service payment is for 20yrs, fixed, and includes all maintenance, break/fix, and emergency support costs per the SOW. The monthly payment goes on the utility bill and starts after the system is fully commissioned, helping MDC delay capital expenditures.

OSPS Monthly Service Payment

Terminal H	Monthly Service Payment
High Estimate	$190,334
Low Estimate	$142,751

The primary driver for the high range is uncertainties in global supply chains and high operational risk mitigation cost. All cost elements will follow MDC's approved sourcing method in the SOW.

No net change to fuel usage is expected as part of this project work.

- The new generator system will test and operate similarly as the existing in place, with difference of undergrounded system vs above ground.
- Fuel costs are the only variable cost that will continue to be paid by MDC.

No net change to electrical consumption is expected as part of this project work.

- The new generator system is emergency backup only. It does not provide baseload support.

Conclusion and Recommendations – Terminal H

FPL recommends immediate replacement and modernization of the aging electrical infrastructure at MIA Terminal H. Should the County proceed with a Non-Residential Backup Power Services Agreement and corresponding Statement of Work with FPL for the identified work by February 2026, FPL is prepared to support construction and installation of the equipment to be operational in 2028.

Appendix – System Drawings – Terminal H (pending to be obtained)

Park 4 Flamingo (MDAD EG-207)

Project Solution Development – Park 4 Flamingo

All project work will be executed in a design-bid-build turnkey project, based on estimates and design guidance established in this feasibility report. This feasibility report is concept level based on design guidance previously established and not permit level drawings or detail.

The project description for Park 4 Flamingo is the end-of-life equipment replacement/modernization of the 480V emergency generator system and main distribution switchgear replacement. The buildout of new indoor switchgear, generator, downstream devices within scope, and related construction will occur in the existing rooms housing the existing generator and switchgear, located adjacent to each other, in the Flamingo parking garage.

Figure 4.1 - Project Location (Park 4 Flamingo)

Condition Assessment – Park 4 Flamingo Main electrical/generator room

The condition of the existing equipment is *extremely poor – risk to operations*.

- 2yr peak electrical demand, based on meter analysis, is 290KW.
- The space is original construction serving critical lighting, fire safety, and operation loads for both the parking garage and miscellaneous passenger-centric loads within terminals in the vicinity.
- Electrical Room
    - The 620KW ~1980's Caterpillar generator is at end-of-life state. It contains an analog setup with no remote monitoring communication. The generator shows significant signs of wear and tear, rust, and patched retrofits such as on the air intake. The associated battery system is adjacent to the generator and poses a leakage risk to the room. The exhaust system exits the room and travels up to the top of the parking garage, due to the central indoor location of this generator.
    - The 4000A Switchgear (Westinghouse) is at its end-of-life state and replacement/modernization is needed to maintain the critical loads. The switchgear is standalone and resides centrally in the adjacent electrical room for general work/construction activity. Space in this room is tight, and air temperature is hot. The main utility breaker, diesel day tank, step-down transformers, and several panels are also located in the room and labelled appropriately. The FPL vault is located adjacent to the north of this room, further upstream in the main garage hallway. Two sets of bus duct punch through overhead and connect to the switchgear from above. The generator room is adjacent to the

electrical room further down the hall, to its south. Equipment is connected amongst the rooms via overhead piping.

- Space
    - Main generator room
        - The room is fully enclosed and an adequate size for its existing equipment. There does not appear to be sufficient room for pursuing a twin-generator system. The generator commands the center of the room with its exhaust system facing south.
        - The generator's exhaust system runs south into the adjacent "exhaust room"
        - The downstream piping runs overhead to ATS switches on the north wall of the generator room. 4 ATS's are associated in total.
        - Removal of the existing generator likely must be done through the "exhaust room" as space insufficiency is a strong concern.
        - The generator room contains adequate space for a new bypass isolation switch/tap box on the north wall with a like-for-like generator replacement in the same location
        - The airflow system will be further analyzed to ensure optimal room temperature. HVAC modernization may be necessary in this space.
        - The MDP is housed in the back of the room beside a step-down transformer.
        - This existing space will be utilized to facilitate buildout of new equipment and replacement of existing. Devices will be physically removed through the main entry doors of this room to the outside (NE).
        - Temporary conductors during construction may enter the room as needed. The routing may enter through the room's main doors or from the back of the room, where the existing plenum is located. This is dependent on ultimate location of temporary equipment. Mobile switchgear and generators have adequate space to be housed outside the room for this concept, whether in the hallway or in the parking area.
        - A new day tank and leak detection system was installed along the west side of the room. Recent noise reduction walls were implemented as well along the main room plenums.
    - Main electrical room
        - The room is tight for its existing equipment. The switchgear is standalone in the center of the room with space on its perimeter. There are no mounted devices on the north wall directly behind the switchgear, with ~3ft separation between the gear and wall. The room is also quite hot and work is needed to improve ventilation and temperature control.
        - This existing space will be utilized to facilitate buildout of new switchgear equipment and replacement of existing. Loads will be migrated, and devices will be physically removed through the main entry doors.
        - There are no mounted devices on the north wall directly behind the switchgear, with ~3ft separation between the gear and wall. A few meters are present on the north wall (northeast side) but not directly behind the switchgear.
        - Temporary conductors during construction will route into the electrical room as needed, during the load migration process. Mobile switchgear and generators have adequate space to be housed outside the room for this concept. Distance will vary per placement of the equipment, but the hallway is directly outside.
    - Diesel tank room
        - The diesel tank is situated in a separate room southeast of the generator room within the garage. The room was tracked down by following the yellow diesel pipes.

There is sufficient unused space outside of this room for to assist with the diesel tank's replacement.

- Site Accessibility
  - The hallway outside the generator and electrical rooms, seen in Figures 10 and 11, contains space available for construction activity - including equipment movement, vehicles, and staging of temporary equipment with relatively low impact to local road traffic or nearby existing operations. Parking spaces by the hallway may be utilized as well per need through coordination with MDAD.
  - The location overall lies within the first floor of the parking garage, so ventilation and height constraints will need to be considered
  - The parking garage is not within the airport's AOA, so security clearance/affairs are overall less stringent. The location can be accessed by passing thru the main parking entry gates and driving along the central road between the dolphin and flamingo garages, before turning left (south) into the flamingo garage.
  - The location is on the central-north side of the garage, if looking aerially. Figure 10 shows the location with respect to the main entry road outside the garage.
  - The space is overall constrained by height restrictions and will require a suitable plan for replacement of the generator, switchgear, and other necessary downstream components
  - Overall traffic can be diverted to other paths. Disruption to ongoing operations, beyond load migration, is generally less of a concern
  - The existing diesel system will be removed and a new installed in its place.

Figure 4.2 – POV from main doors/hallway looking into generator room (facing west)

Figure 3.3 – Rear view of generator

Figure 4.4 – Day tank in generator room

Figure 4.5 – North wall of generator room. Includes 2 ATS's and main duct from generator. Adequate space.

Figure 4.6 – North wall of generator room

Figure 4.7 – Front side of switchgear, view of electrical room taken from entry door. South wall of electrical room on left side of photo.

Figure 4.8 – Angled view of the switchgear

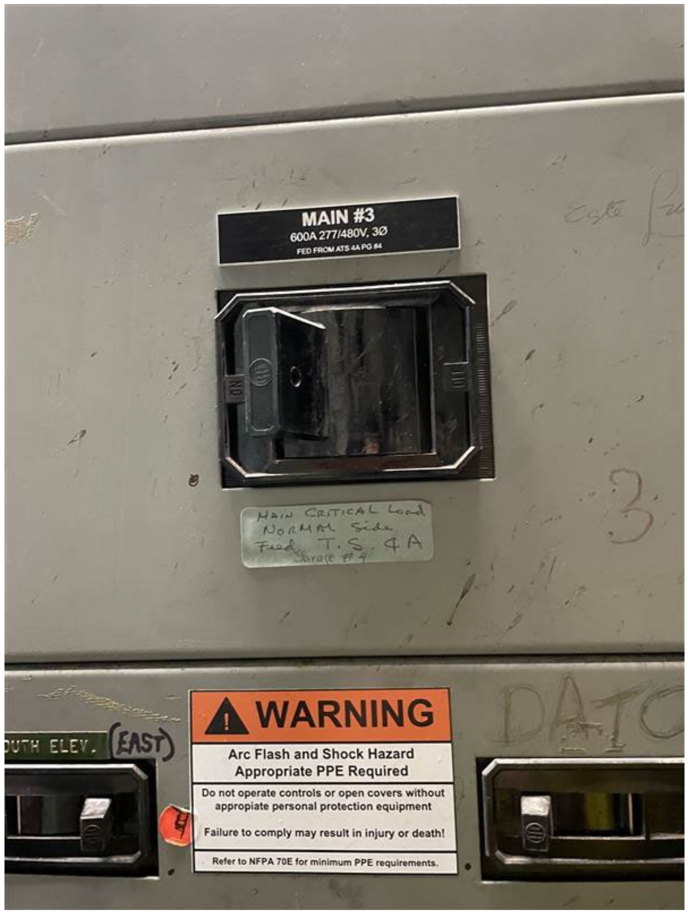


Figure 4.9 – Main #3 on the switchgear

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Figure 4.10 – Rear side of switchgear with overhead bus duct leading to FPL vault thru north wall

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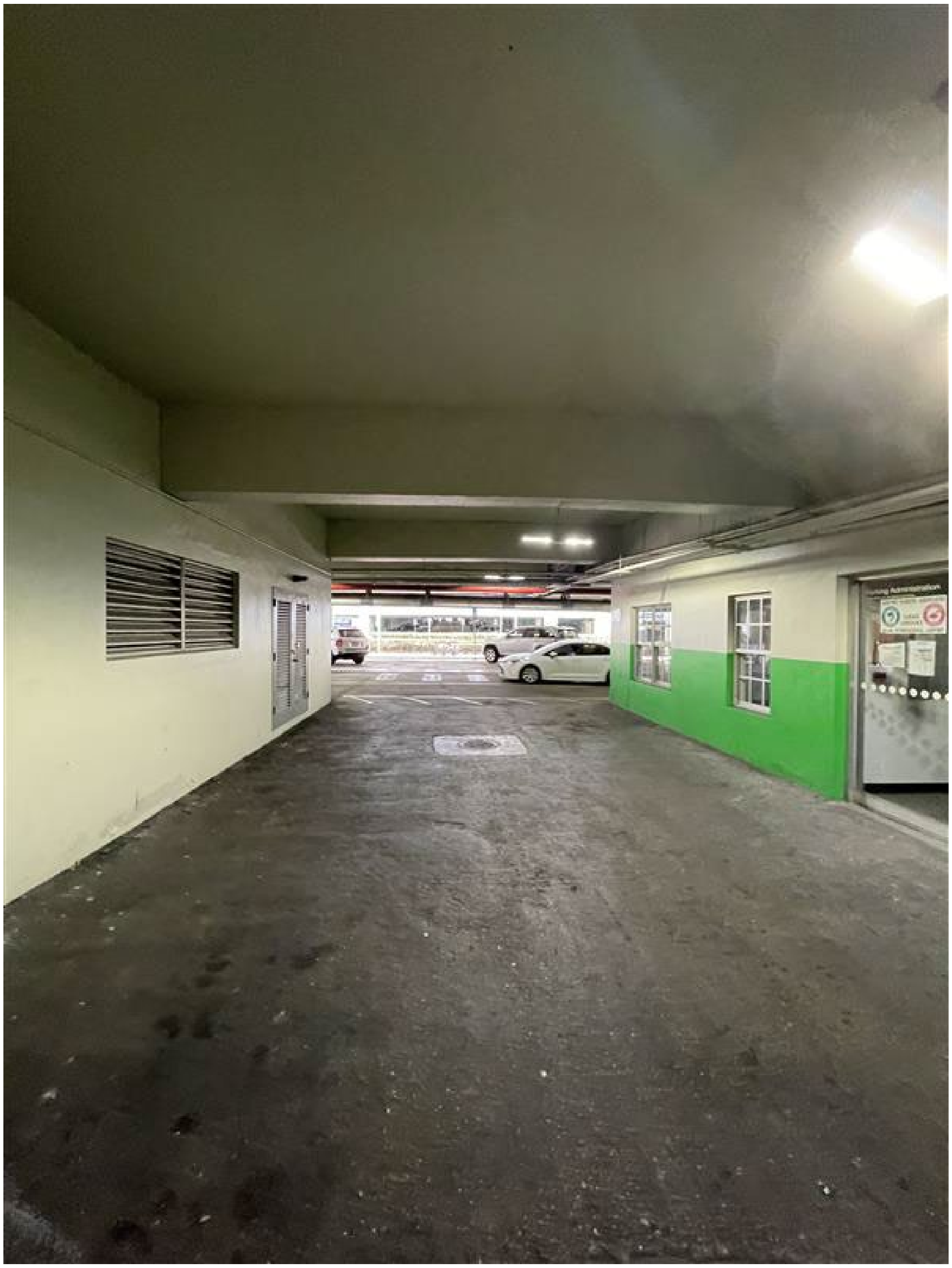

Figure 4.11 – Hallway leading to generator and electrical rooms - facing north. Parking lot and outdoor road located in rear of photo. The FPL vault doors are visible on left side of photo. Generator and electrical rooms lie directly to left of photo.

Figure 4.12 – Hallway leading to electrical room and generator room, facing south. The electrical room is the open door on right side of photo.

Figure 4.13 – Exhaust room view facing north towards generator.

Figure 4.14 – Exhaust room view facing west. Exhaust system turns upwards in background towards top of garage.

Figure 4.15 – Rear side (west) of electrical/generator rooms. Left plenum is air intake for generator and right plenum is associated with radiator exhaust system (ref figures 10 & 11).

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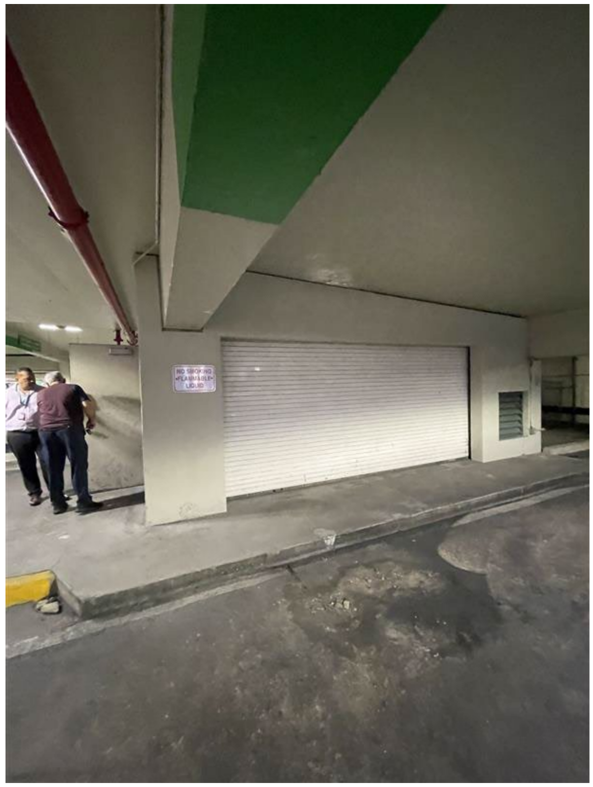

Figure 4.16 – Space outside room hosting diesel tank

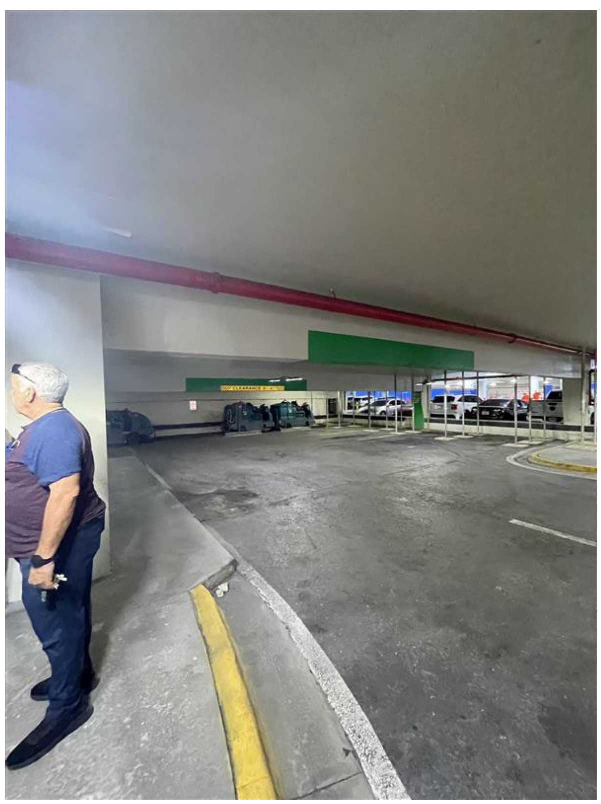

Figure 4.17 – Space outside room hosting diesel tank

Figure 4.18 – 2400-gallon diesel tank

Figure 4.19 – 2400-gallon diesel tank

Figure 4.20 – Control device within diesel tank room

Project Plan – Park 4 Flamingo

To address the operational risk identified in the condition assessment and incorporating the design concepts for FPL backup generation systems at MIA, the following concept solution is proposed. This solution will be executed in a design-bid-build project plan.

Project Description – Park 4 Flamingo

Backup power service to provide an alternative source of electrical power and electrical distribution equipment to Park 4 Flamingo. Based on site installation conditions and electrical load data, Company expects to utilize 290KW of backup generation capacity, controls, and new main distribution switchgear to provide service to the electrical loads, based on the historical 24-month metering data, associated with FPL Account Number 83447-70816.

Scope of Work – Park 4 Flamingo

See appendix for system drawings. The scope includes all construction and permitting by licensed contractors, per applicable codes.

The new generator system will replace the existing in the same location, like-for-like. The new generator system will serve the same electrical systems as the existing. The exhaust system will be replaced and modernized.

Electrical System

- 620KW Tier 2 Generator
    - 277/480V, 3 Phase, 60Hz
    - 24hr adjacent day fuel tank (recently replaced)

    - Enclosed exhaust system leading to a vertical exit path, thru adjacent room, to the top of the parking garage (7 stories)
    - Battery system and maintainer
- 4000A Switchgear
    - Main-Tie-Main configuration, fully rated
    - PLC controls
    - (4) associated Automatic transfer switches
    - Indoor equipment
- Main Distribution Panel
    - Main-Tie-Main system
    - PLC controls
- Remote monitoring
    - Generator system and switchgear
    - Cellular based
- Diesel fuel storage tank
    - Indoor 2400-gallon rated diesel tank
    - Sized appropriately to generator
    - Modern leak detection system

<u>Building Upgrades</u>

- Removal of existing generators, switchgear, and refurbishment of existing space.
- Update and modify air-handlers as-necessary to maintain temperature and humidity control of new system.
- Update and modernize the exhaust piping and diesel tank system as necessary.

<u>Temporary Power Plan</u>

- A robust temporary power plan is intended and will be evaluated with MDAD during the detailed construction phase of the project.
- At a minimum, all loads are assumed that brief outages can be planned/coordinated with stakeholders to tie-in temporary equipment. This enables continuous operations while electrical work takes place.
- Temporary equipment can be tied in at the main distribution panel.

Schedule – Park 4 Flamingo

A project timeline is included below. This timeline reflects estimated date ranges of work to be performed. Actual dates may vary, are non-binding, and are subject to change. The below critical items are required from MDC to move forward in each phase of the project construction timeline.

Milestone	Week(s)
Signed Agreement / PO Issued	1
Procurement - Public Notice	2 - 6
Procurement - Engineering Services	6 - 8
Selection - Engineering Services	9 - 10
Engineering Phase	10 - 18
Start Procurement - Equipment & Services	16 - 22
Selection - Equipment & Services	22 - 23
Permit Submittal	22
Long Lead Sourcing / Planning / Permit Acceptance	23 - 75
Start Construction	78
Ground work	78 - 88
Generator Delivery & Gen Switchgear	89 - 92
Critical Event - Cutover #1 - A Side	93
Critical Event - Cutover #2 - B Side	94
Final System Commissioning / Closeout	95 - 96
Contingency	97 - 104

Performance Bonds

Single instrument Payment and Performance Bonds will be obtained for each construction project. These bonds will remain in effect for six months following construction operation date. Fees related to bond costs will be determined based on specific project requirements and risks and will be passed on to MDC at FPL cost in each applicable statement of work as part of the service fees thereunder.

Responsibility Matrix

FPL is responsible for design and proposal of backup power solutions and distribution-related service upgrades. Various departments within FPL will be involved throughout the project. Similarly, MDC has identified departments to be involved in certain key processes. A listing of the departments involved is included below.

	FPL	Miami-Dade
Technical Feasibility		
Equipment designs	Engineering & Construction (E&C)	MDAD
Service upgrades	Power Delivery (PD)	MDAD
Installation Analysis		
Agreement & SOW	Development, Legal	RER, MDAD
Procurement	E&C, Sourcing	MDAD, RER
Permitting	E&C	RER, MDAD, City of Miami
Inspections	E&C	RER, MDAD, City of Miami
Flood Zones	E&C	MDAD, RER
Sea Level Rising	E&C	MDAD, RER
Tree Removal Impacts	E&C	RER, MDAD
System designs	E&C	MDAD, RER
Service upgrades	PD	MDAD
Account set-up	Development, Customer Service	MDAD

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Technical and Construction Feasibility – Park 4 Flamingo

The Park 4 Flamingo system represents a critical system to upgrade and modernize due to 24/7 operational requirements, age of the existing equipment, lighting loads, and other passenger-oriented loads.

No new space is required for new switchgear and generator replacement. New equipment will be re-located where existing equipment is housed.

The generator replacement will require removal of the existing tanks and all associated plumbing. Temporary equipment during construction will require some space with temporary provisions and coordination with vested parties.

Numerous unknowns exist, particularly with the exhaust piping system, with its vertical trajectory from ground level. It is reasonable to anticipate various other utilities running in the general vicinity of these rooms of scope, and local pedestrian/vehicle traffic within the garage.

Permit Applications and Inspections – Park 4 Flamingo

Permits are required for all electrical work per Florida Building Code, Miami-Dade County Code, and City of Miami code enforcement. All applicable codes will be adhered too and formalized in the design stage of the project by the Engineer of Record (EOR).

Engineering Services – Park 4 Flamingo

No engineering services have been utilized in recent history to FPL's understanding to address the electrical system at Park 4 Flamingo. As part of this project, we will follow the county's process for obtaining bids, selecting a contractor, and obtaining necessary drawings for the project's scope.

Financial Feasibility – Park 4 Flamingo

The OSPS Backup Generator Monthly Service Payment for Park 4 Flamingo is estimated based on pre-survey design and prior to equipment purchase and installation. As stated in the Statement of Work (SOW), actual costs are estimated as a range for rough-order-of-magnitude planning and approval. The actual cost will be based on 100% permit approved design and competitive bidding, based on concept developed in this feasibility report. The monthly service payment is for 20yrs, fixed, and includes all maintenance, break/fix, and emergency support costs per the SOW. The monthly payment goes on the utility bill and starts after the system is fully commissioned, helping MDC delay capital expenditures.

OSPS Monthly Service Payment

Park 4 Flamingo	Monthly Service Payment
High Estimate	$80,634
Low Estimate	$60,476

The primary driver for the high range is uncertainties in global supply chains and high operational risk mitigation cost. All cost elements will follow MDC's approved sourcing method in the SOW.

No net change to fuel usage is expected as part of this project work.

- The new generator system will test and operate similarly as the existing in place.
- Fuel costs are the only variable cost that will continue to be paid by MDC.

No net change to electrical consumption is expected as part of this project work.

- The new generator system is emergency backup only. It does not provide baseload support.

Conclusion and Recommendations – Park 4 Flamingo

FPL recommends immediate replacement and modernization of the aging electrical infrastructure at MIA Park 4 Flamingo. Should the County proceed with a Non-Residential Backup Power Services Agreement and corresponding Statement of Work with FPL for the identified work by February 2026, FPL is prepared to support construction and installation of the equipment to be operational in 2028.

Appendix – System Drawings – Park 4 Flamingo

(NOT AVAILABLE AT THIS TIME – ALL OBTAINED RELATED PLANS DO NOT COVER THIS SCOPE)

Park 2 Consumer (MDAD EG-206A)

Project Solution Development – Park 2 Consumer

All project work will be executed in a design-bid-build turnkey project, based on estimates and design guidance established in this feasibility report. This feasibility report is concept level based on design guidance previously established and not permit level drawings or detail.

The project description for Park 2 Consumer is the end-of-life equipment replacement/modernization of the 480V emergency generator system and main distribution switchgear replacements. The buildout of new indoor switchgear units, generator, downstream devices within scope, and related construction will occur in the existing generator room and adjacent switchgear room. A new above-ground diesel tank will replace the one existing in the adjacent enclosed space south of the generator room, as well as downstream piping replacement to the day tank/generator. Disruption to ongoing airport operations should be minimized.

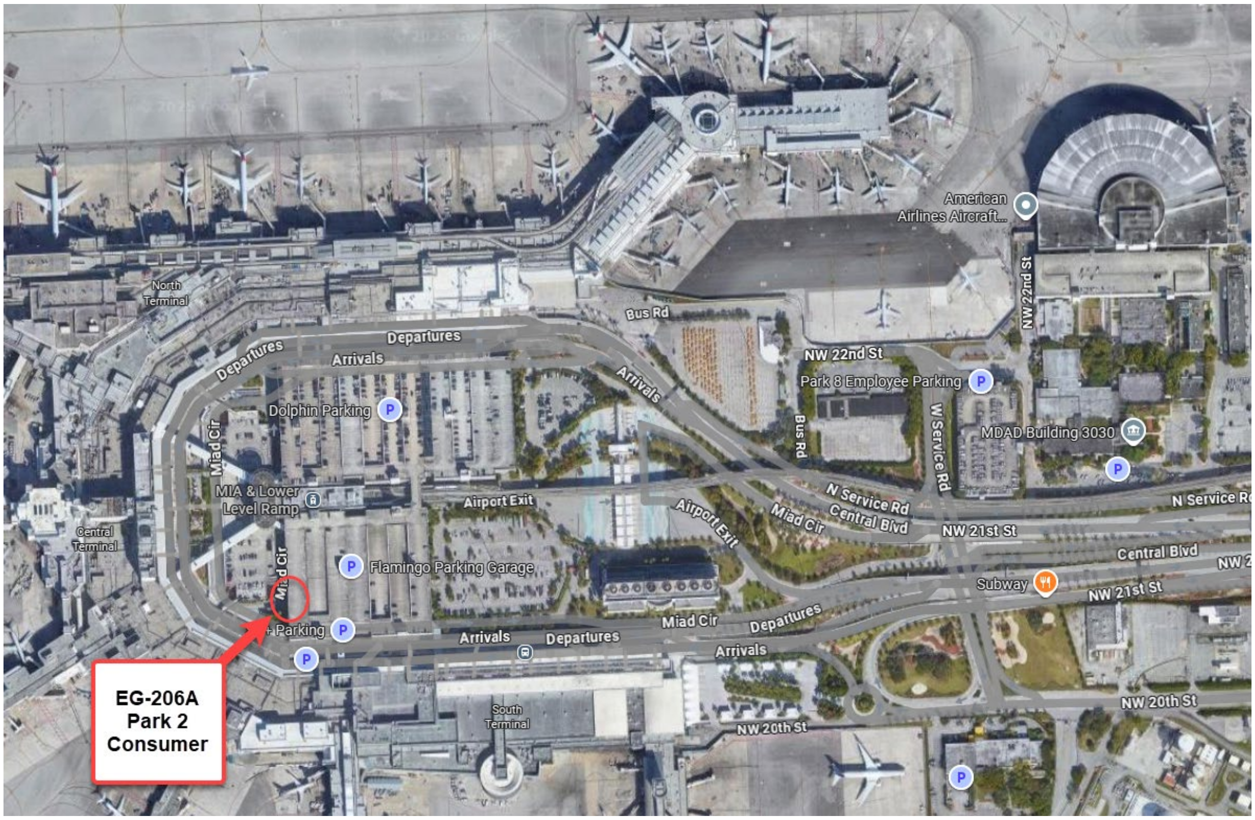

Figure 5.1 - Project Location (Park 2 Consumer)

Condition Assessment – Park 2 Consumer electrical/generator room

The condition of the existing equipment is *poor – risk to operations*.

- 2yr peak electrical demand, based on meter analysis, is 760KW. The current generator serves multiple life/safety loads. It does not serve the entire demand load.
- The spaces are original construction serving parking garage lighting and various loads within the central and south passenger terminal areas.
- Major Spaces
  - Generator Room
    - The 750 kW Caterpillar generator is at end-of-life state, with over 35 years in operation. It contains an analog setup with no remote monitoring communication. The generator shows signs of aging, wear and tear, and some rust.
    - The generator is readily accessible in the center of the room. Replacement should be straightforward in terms of accessibility and maneuverability of equipment.
    - Associated batteries for the generator
    - Space in the room is plentiful for accessibility and construction-related activity. A door leads outside (west wall) beside the fan/exhaust system. The main entrance into the room comes from larger doors from the parking garage, on the east side.
    - The exhaust system points west and out of the building thru the room's exterior wall.
    - The day tank is in the back corner of the room (SW) and replacement is needed. A leak detection system was recently installed on the device. Downstream diesel piping to the generator runs along the ground near the exhaust fan.

- The generator's associated downstream piping runs overhead to a 1200A emergency distribution panel with two 600A ATS outputs on the other side of the wall, in the switchgear room. This is located across the walkway from the generator, and quite visible. No other major panels or units are in the vicinity.
- The walls of the room are mostly clear. Galvanized piping from the diesel system runs along the south wall.

- Switchgear Room
  - The generator room is located adjacent to the south. The FPL vault is located adjacent to the north.
  - Equipment in the room qualifies for a full replacement. The room contains plentiful space and room for new equipment to be installed. Switchgear, MDP, and ATS's all fall within scope for replacement and modernization.
  - The room includes 2 main switchgear units, rated at 3000A each
  - The Siemens switchgear units contain several loads such as parking garage lighting, elevators, communications, a hotel, and nearby passenger concessions in the central/south pre-security areas. Several loads run downstream from each switchgear unit. These loads will need migrated, served from temporary power, and re-migrated before full switchgear replacement.
  - Upon entering the room from garage side (main doors), the 3000A Switchboard Section #1 is located on the right. Section #1 is closer to the FPL vault/overhead bus stubs. The unit is connected to the FPL vault via overhead bus duct and has considerable accessibility on its full perimeter.
  - Switchgear Section #2 is also rated at 3000A. This device houses multiple loads and is located across from Section #1. Accessibility is also plentiful on the device's surroundings.
  - The (2) 600A ATS's serve life-safety loads only and are located behind Switchgear #2 on the south wall.
  - The FPL metering cabinet is housed in an enclosed box on the north wall of the switchgear room
  - Some downstream panels and a step-down transformer are found on the west wall in vicinity Switchgear #2
  - The louvre double doors for both rooms are located adjacent on the garage side (east).
  - Depending on final chosen site location, temporary conductors during construction will run thru doors into the switchgear room. If mobile switchgear and generators are selected to be housed outdoors on the road shoulder or mulch area, then cables will enter thru the west doors. This appears to be a more reasonable location. If equipment is decided to be housed on the concrete thru-way in the garage, cables will enter thru the east doors.
- Outdoor Space
  - There is space immediately outside the generator room (west side) available for construction activity - including equipment movement, vehicles, and staging of temporary equipment. The space is covered with mulch, some low bushes, and a few trees. A road curves 90 degrees roughly 20ft away from the exterior with a dumpster housed on the road's edge. The road is relatively low on traffic and a lane of the road could be utilized to stage, with coordination from the MDAD team.

- The area is not located airside and can be accessed from the outside via the arrivals level and/or driving around the garage perimeter. Space is available but limited and caution must be taken given height clearances and local traffic.
- Traffic is relatively light in the garage outside the rooms' east doors as well. Traffic can divert if some space in this thru way is utilized.

Figure 5.2 – Generator room – taken from main doors on east wall.

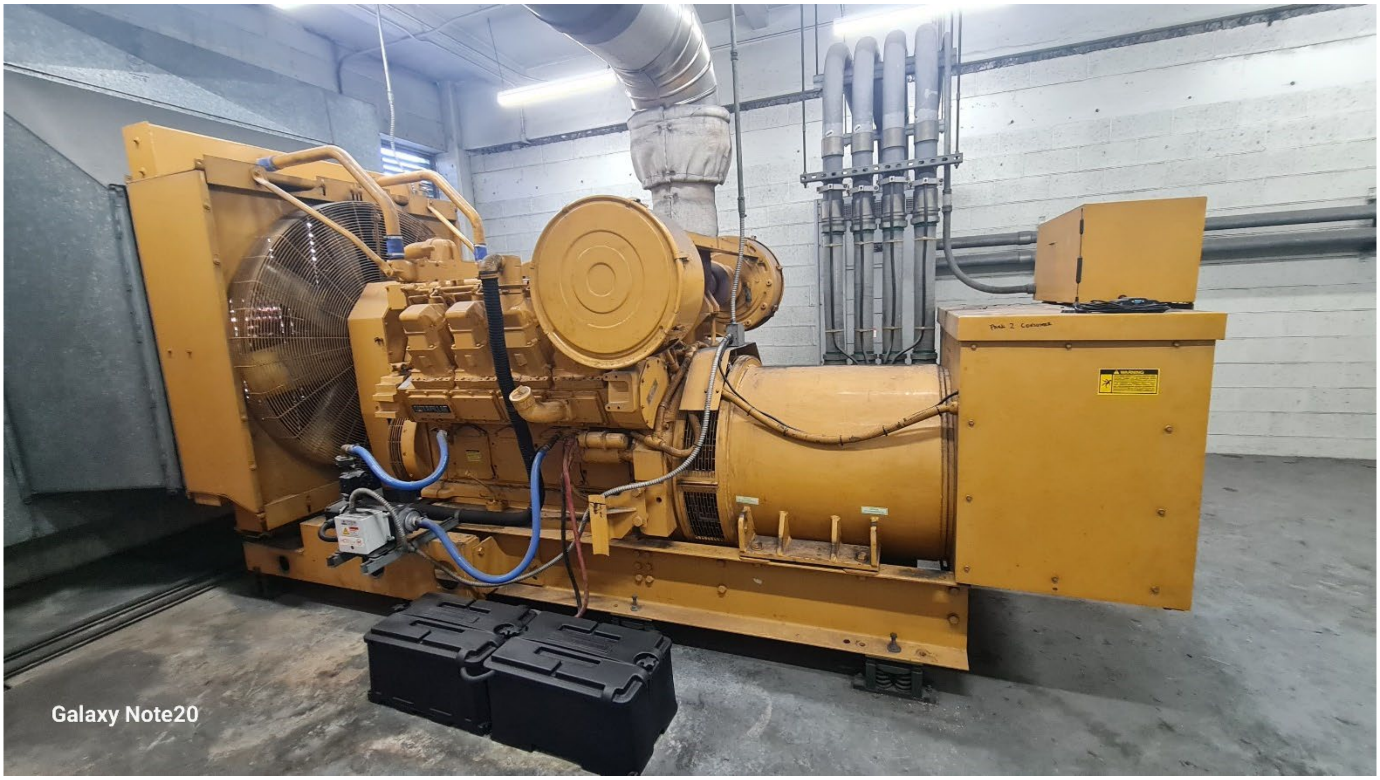

Figure 5.3 – Side angle of generator with batteries in foreground.

Figure 5.4 – Alternate view of generator room. East doors to room in rear of photo.

Figure 5.5 – Diesel Day tank in generator room

Figure 5.6 – Side view of diesel day tank

Figure 5.7 – Immediate downstream panel from generator, receiving 4 overhead pipes. Plans indicate cable size of (4) 500MCM. 2 ATS outputs are on other side of wall.

Figure 5.8 – "North" switchgear unit #1 in switchgear room, taken from main door. Bus duct enters FPL vault behind photo to right.

Figure 5.9 – Alternate view of north switchgear unit (Switchgear #1)

Figure 5.10 – "South" switchgear, taken from room's main doors (Switchgear #2)

Figure 5.11 – Alternate view of south switchgear (Switchgear #2)

Figure 5.12 – ATS #2 on south wall of switchgear room with associated emergency panel. Located behind Switchgear #2. Downstream of pipes shooting to right from main panel in Figure 5.2 (on other side of wall).

Figure 5.13 – ATS #1 on south wall of switchgear room with associated emergency panel to left of photo. Located directly behind & downstream of main panel in figure 3, on other side of wall.

Figure 5.14 – Space behind Switchgear #1 & north wall (~4-5ft of space). FPL vault located behind wall.

Figure 5.15 – Exterior (west) wall of switchgear room. Switchgear #2 to left of photo.

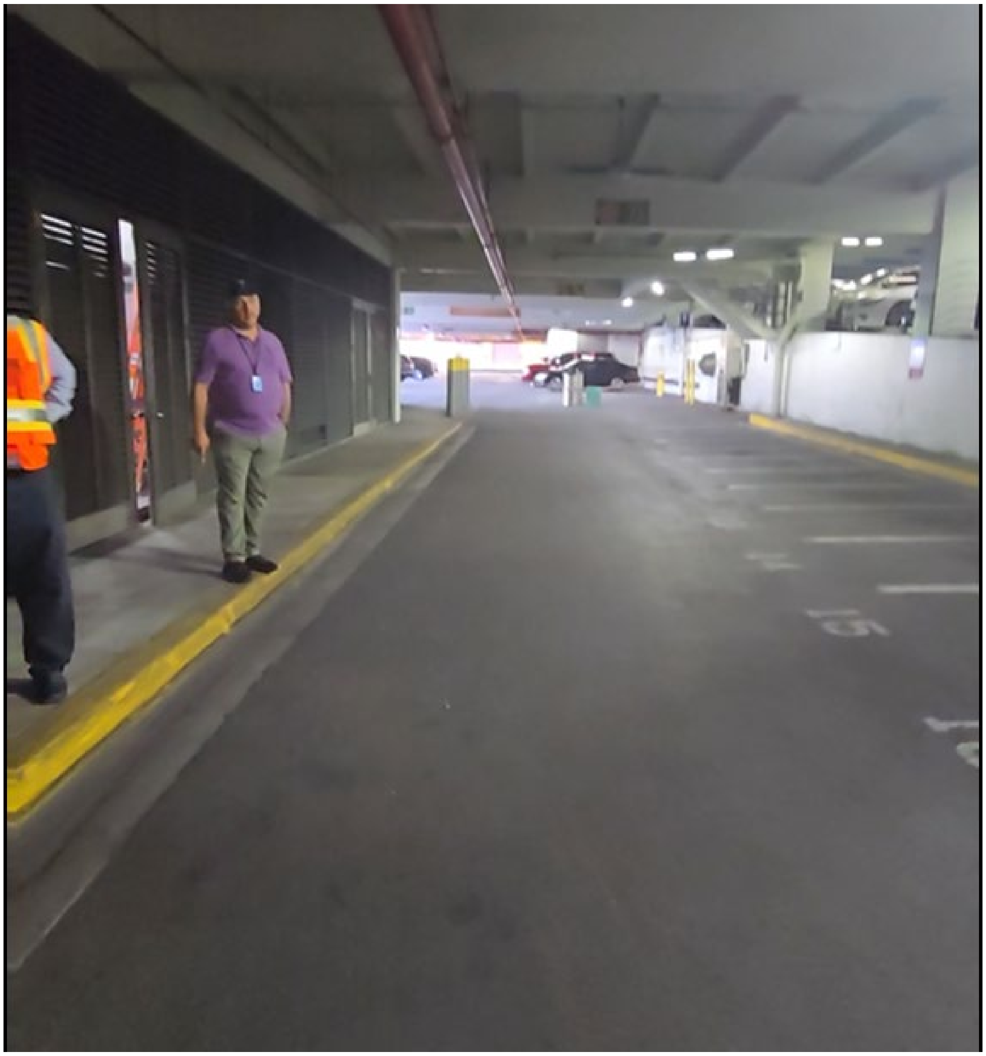

Figure 5.16 – Area outside of electrical/switchgear rooms to east, in parking garage. Facing north.

Figure 5.17 – Road/shoulder outside of electrical and switchgear rooms. Potential landing area for temporary equipment and general construction access. Photo faces north from switchgear room doors.

Figure 5.18 – Mulch/trees/bushes outside of electrical and switchgear rooms. Road and dumpster to right of photo. Potential landing area for temporary equipment and general construction access. Photo faces south from switchgear room doors.

Figure 5.19 – Location outside of generator and switchgear rooms, taken roughly 25ft north of Figure 19 in same direction.

Figure 5.20 – Frontal view of 2600-gallon diesel tank

Project Plan – Park 2 Consumer

To address the operational risk identified in the condition assessment and incorporating the design concepts for FPL backup generation systems at MIA, the following concept solution is proposed. This solution will be executed in a design-bid-build project plan.

Project Description – Park 2 Consumer

Backup power service to provide an alternative source of electrical power and electrical distribution equipment to Park 2 Consumer Bldg. Based on site installation conditions and electrical load data, Company expects to utilize 760 KW of backup generation capacity, controls, and new main distribution switchgear to provide service to the electrical loads, based on the historical 24-month metering data, associated with FPL Account Number 16558-36086. The switchgear room will include a HVAC component in order to properly ventilate and air cool the new equipment.

Scope of Work – Park 2 Consumer

See appendix for system drawings. The scope includes all construction and permitting by licensed contractors, per applicable codes.

The new generator system will replace the existing in the same location. The new generator system will serve the same electrical systems as the existing from the same room. All switchgear units will represent a like-for-like replacement. Downstream panels and other switchboards will be replaced per need and existing condition.

Electrical System

- (1) 1MW Tier 2 Generator
  - 277/480V, 3PH
  - Associated diesel day tank, recently replaced
  - Battery system and maintainer
- 2 Main Switchgear Units, rated at 3000A each
  - Main-Tie-Main configuration, fully rated
  - PLC platform & controls
  - Modern, high-reliability breakers that meet current electrical codes and safety standards
  - Integrated advanced control & monitoring features to support automatic operation & protective relaying
  - Remote monitoring and command capability
    - Coordination with load management and protection schemes
- (1) 1200A EDP and (2) 600A automatic transfer switches
  - Replacement of downstream subpanels and wiring per need
- Remote monitoring
  - Generator system and switchgear
  - Cellular based
- 2600-gallon diesel fuel storage tank
  - Tank to replace existing in adjacent storage room, like-for-like
  - Sized appropriately to generator(s)
  - Pipe installation for twin generator system
  - Modern leak detection system

Building Upgrades

- Removal of existing generator, switchgear, and refurbishment of existing space.
- The rooms will be restored to condition prior to construction – such as holes in walls. Lighting in the rooms appears sufficient and space is plentiful.
- The switchgear room will better temperature-controlled with improved ventilation to provide a suitable environment for installation of new equipment.
- Modernize diesel pipe routing from the replaced tank into the generator room. Update piping as necessary in and around the generator(s).

Temporary Power Plan

- A robust temporary power plan is intended and will be evaluated with MDAD during the detailed construction phase of the project.
- Loads will need to be migrated in between devices as switchgear equipment is removed and installed.
- At a minimum, all loads are assumed that brief outages can be planned/coordinated with stakeholders to tie-in temporary equipment. This enables continuous operations while electrical work takes place.
- Temporary equipment can be tied in at the EDP for life-safety loads, and individual panels per load may tie into temporary switchgear.
- Significant planning will need to occur given the criticality and size of the loads for active passenger-oriented areas.

Schedule – Park 2 Consumer

A project timeline is included below. This timeline reflects estimated date ranges of work to be performed. Actual dates may vary, are non-binding, and are subject to change. The below critical items are required from MDC to move forward in each phase of the project construction timeline.

Milestone	Week(s)
Signed Agreement / PO Issued	1
Procurement - Public Notice	2 - 6
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Ground work	78 - 88
Generator Delivery & Gen Switchgear	89 - 92
Critical Event - Cutover #1 - A Side	93
Critical Event - Cutover #2 - B Side	94
Final System Commissioning / Closeout	95 - 96
Contingency	97 - 104

<u>Performance Bonds</u>

Single instrument Payment and Performance Bonds will be obtained for each construction project. These bonds will remain in effect for six months following construction operation date. Fees related to bond costs will be determined based on specific project requirements and risks and will be passed on to MDC at FPL cost in each applicable statement of work as part of the service fees thereunder.

<u>Responsibility Matrix</u>

FPL is responsible for design and proposal of backup power solutions and distribution-related service upgrades. Various departments within FPL will be involved throughout the project. Similarly, MDC has identified departments to be involved in certain key processes. A listing of the departments involved is included below.

	FPL	Miami-Dade
Technical Feasibility		
Equipment designs	Engineering & Construction (E&C)	MDAD
Service upgrades	Power Delivery (PD)	MDAD
Installation Analysis		
Agreement & SOW	Development, Legal	RER, MDAD
Procurement	E&C, Sourcing	MDAD, RER
Permitting	E&C	RER, MDAD, City of Miami
Inspections	E&C	RER, MDAD, City of Miami
Flood Zones	E&C	MDAD, RER
Sea Level Rising	E&C	MDAD, RER
Tree Removal Impacts	E&C	RER, MDAD
System designs	E&C	MDAD, RER
Service upgrades	PD	MDAD
Account set-up	Development, Customer Service	MDAD

Technical and Construction Feasibility – Park 2 Consumer

The Park 2 Consumer system represents a critical system to upgrade and modernize due to 24/7 operational requirements, age of the existing equipment, garage lighting, hotel, pre-screening areas, and general passenger-oriented loads

No new space is required for new switchgear, diesel tank, and generator replacement. New equipment will be re-located where existing equipment is housed across the spaces.

The generator replacement will include replacement of diesel tank, day tank, and associated plumbing as deemed necessary. Temporary equipment during construction will require some space. Temporary provisions and coordination must occur with vested parties. Coordination with MDAD is necessary for potential partial/full road closures on site perimeter.

Numerous unknowns exist underground such as pipe condition and other utilities. Associated electrical plans, albeit dates, reveal location of various underground facilities in site vicinity.

The type of mechanical equipment contemplated does not trigger additional requirements for other building upgrades to adhere to LEED Silver Certification. LEED certification is not in-scope for Park 2 Consumer system upgrades.

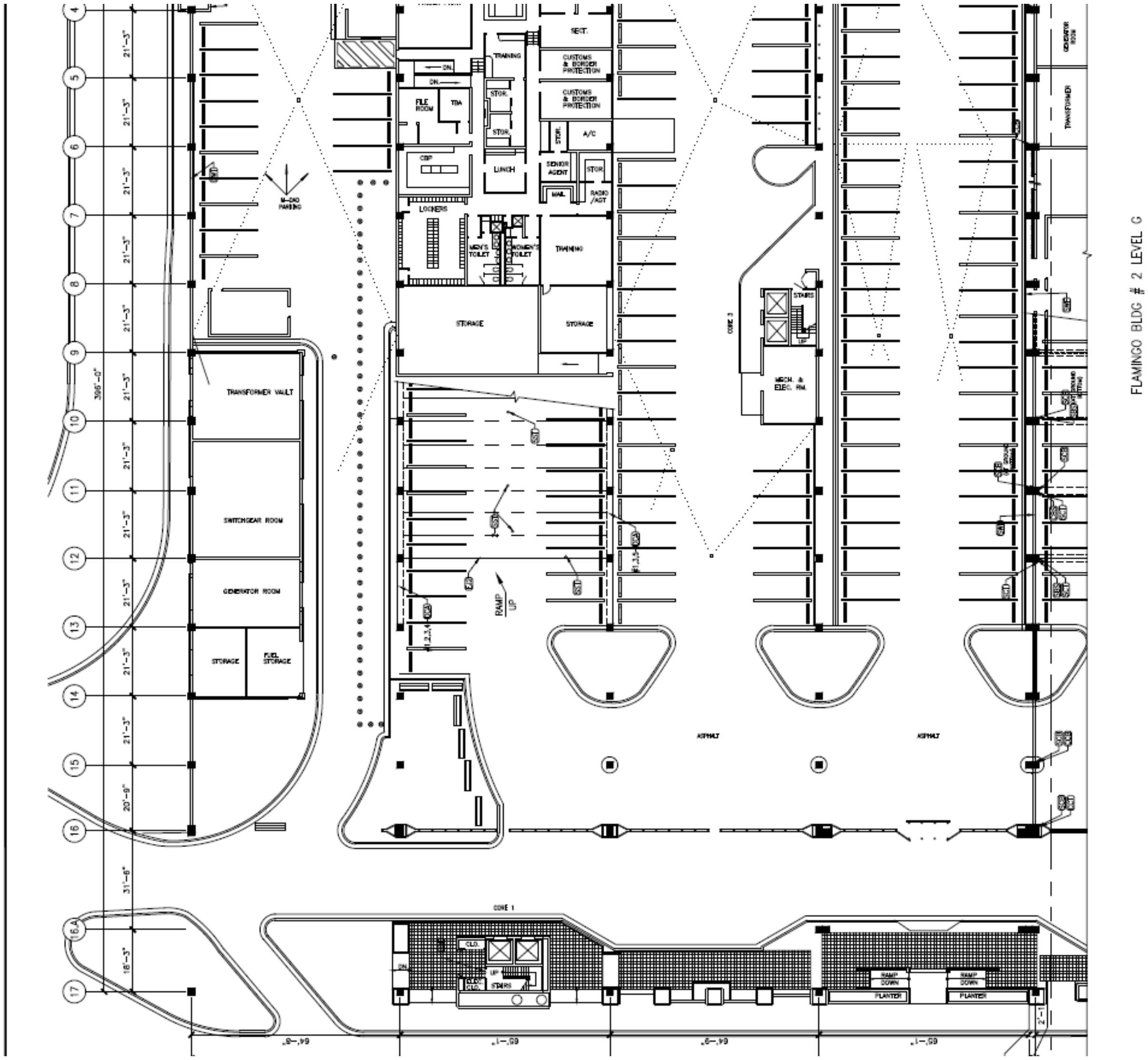

Figure 5.20 – Location of rooms of concern with respect to greater vicinity of SW side of Park 2 Garage. Rooms visible on left with zoomed in snapshot on next figure.

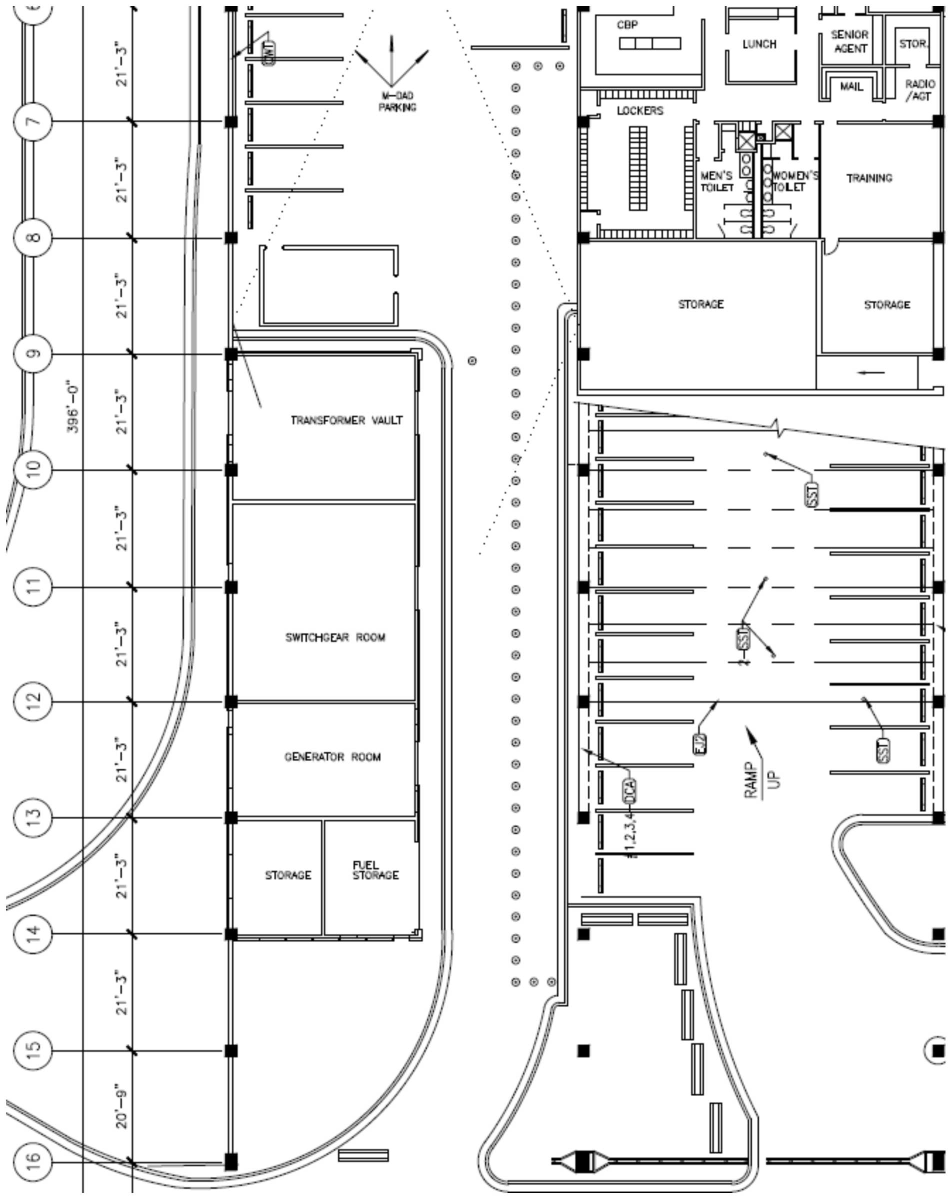

Figure 5.21 – Zoomed in photo of Figure 19. Layout/diagram of rooms within scope.

Permit Applications and Inspections – Park 2 Consumer

Permits are required for all electrical work per Florida Building Code, Miami-Dade County Code, and City of Miami code enforcement. All applicable codes will be adhered to and formalized in the design stage of the project by the Engineer of Record (EOR).

Engineering Services – Park 2 Consumer

No engineering services have been utilized in recent history to FPL's understanding to address the electrical systems in these fuel storage, generator, or switchgear rooms. As part of this project, we will follow the county's process for obtaining bids, selecting a contractor, and obtaining necessary drawings for the project's scope.

Financial Feasibility – Park 2 Consumer

The OSPS Backup Generator Monthly Service Payment for Park 2 Consumer is estimated based on pre-survey design and prior to equipment purchase and installation. As stated in the Statement of Work (SOW), actual costs are estimated as a range for rough-order-of-magnitude planning and approval. The actual cost will be based on 100% permit approved design and competitive bidding, based on concept developed in this feasibility report. The monthly service payment is for 20yrs, fixed, and includes all maintenance, break/fix, and emergency support costs per the SOW. The monthly payment goes on the utility bill and starts after the system is fully commissioned, helping MDC delay capital expenditures.

OSPS Monthly Service Payment

Park 2 Consumer	Monthly Service Payment
High Estimate	$117,542
Low Estimate	$88,157

The primary driver for the high range is uncertainties in global supply chains and high operational risk mitigation cost. All cost elements will follow MDC's approved sourcing method in the SOW.

No net change to fuel usage is expected as part of this project work.

- The new generator system will test and operate similarly as the existing in place
- Fuel costs are the only variable cost that will continue to be paid by MDC.

No net change to electrical consumption is expected as part of this project work.

- The new generator system provides emergency backup.

Conclusion and Recommendations – Park 2 Consumer

FPL recommends immediate replacement and modernization of the aging electrical infrastructure at Park 2 Consumer. Should the County proceed with a Non-Residential Backup Power Services Agreement and corresponding Statement of Work with FPL for the identified work by February 2026, FPL is prepared to support construction and installation of the equipment to be operational in 2028.

Appendix – System Drawings – Park 2 Consumer

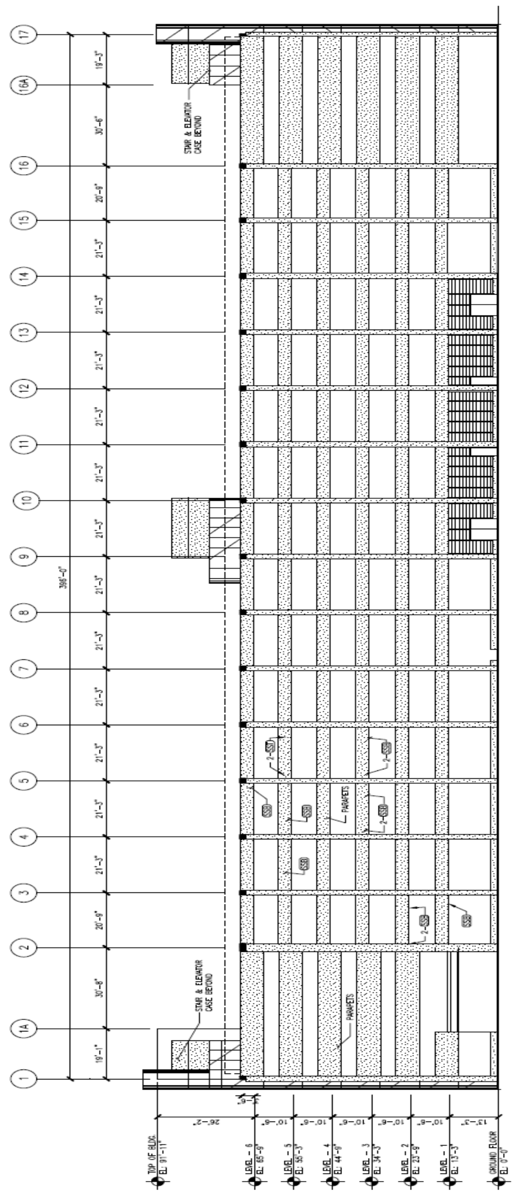

Figure 5.22 – Elevation of Park 2 from west face with dimensions. Exterior rooms within scope visible with louvres. Level 1 begins at 13'-3" elevation with respect to ground floor.

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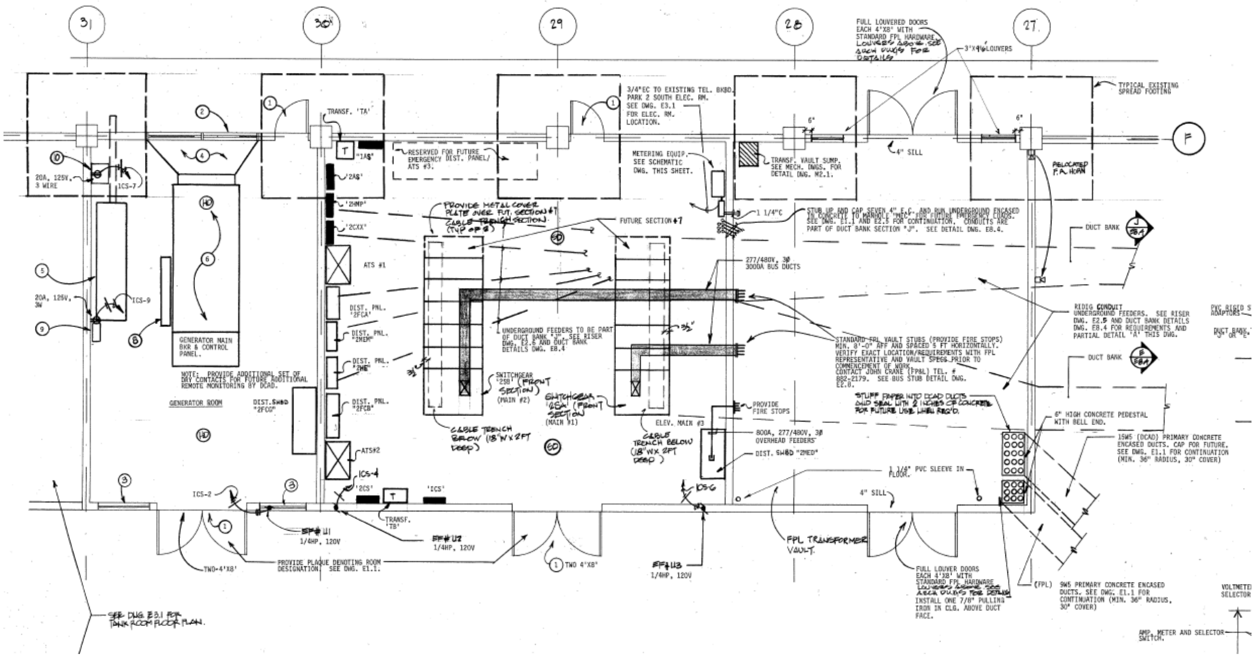

Figure 5.23 - Overall layout for generator & switchgear rooms

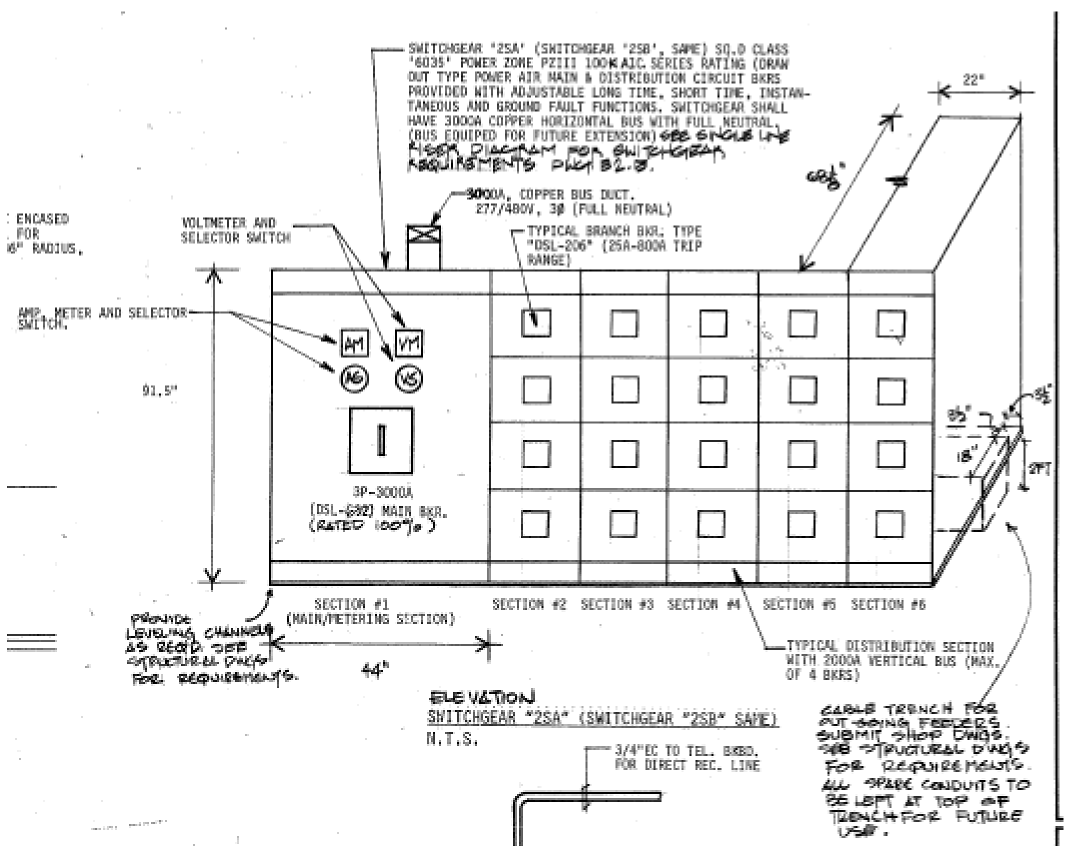

Figure 5.24 - Switchgear unit diagram

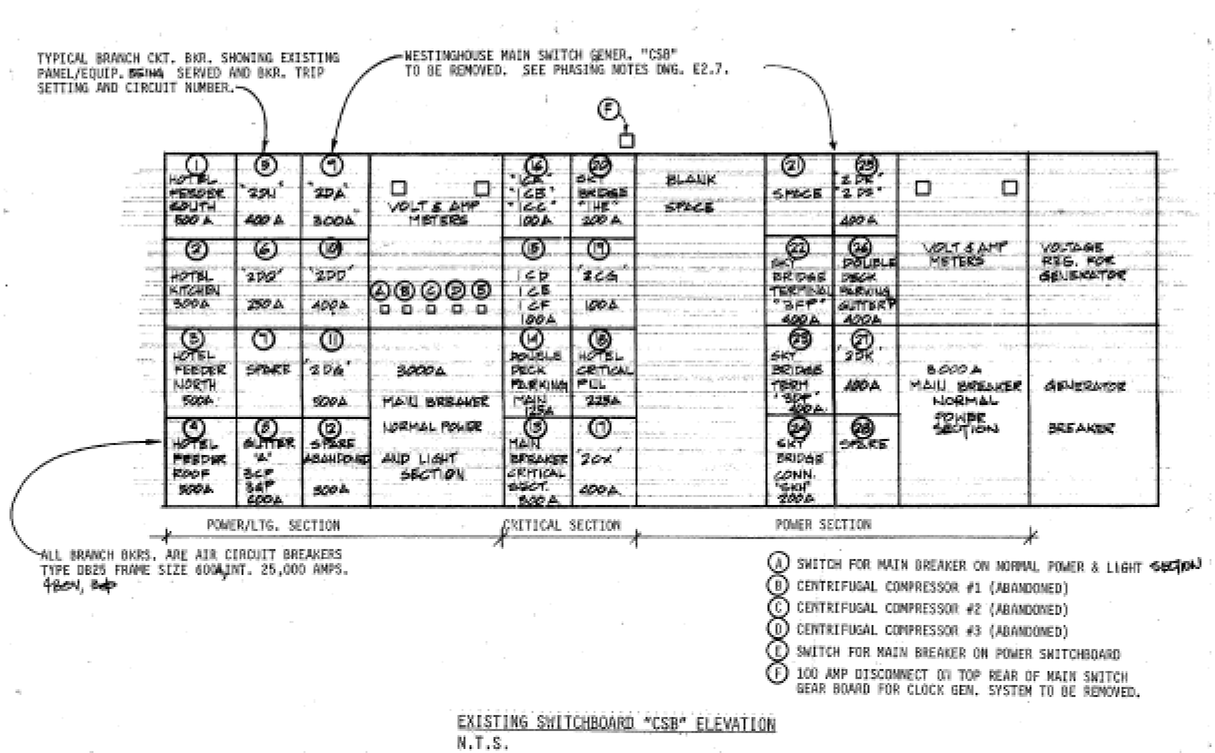

Figure 5.25 – Switchgear services/additional unit diagram

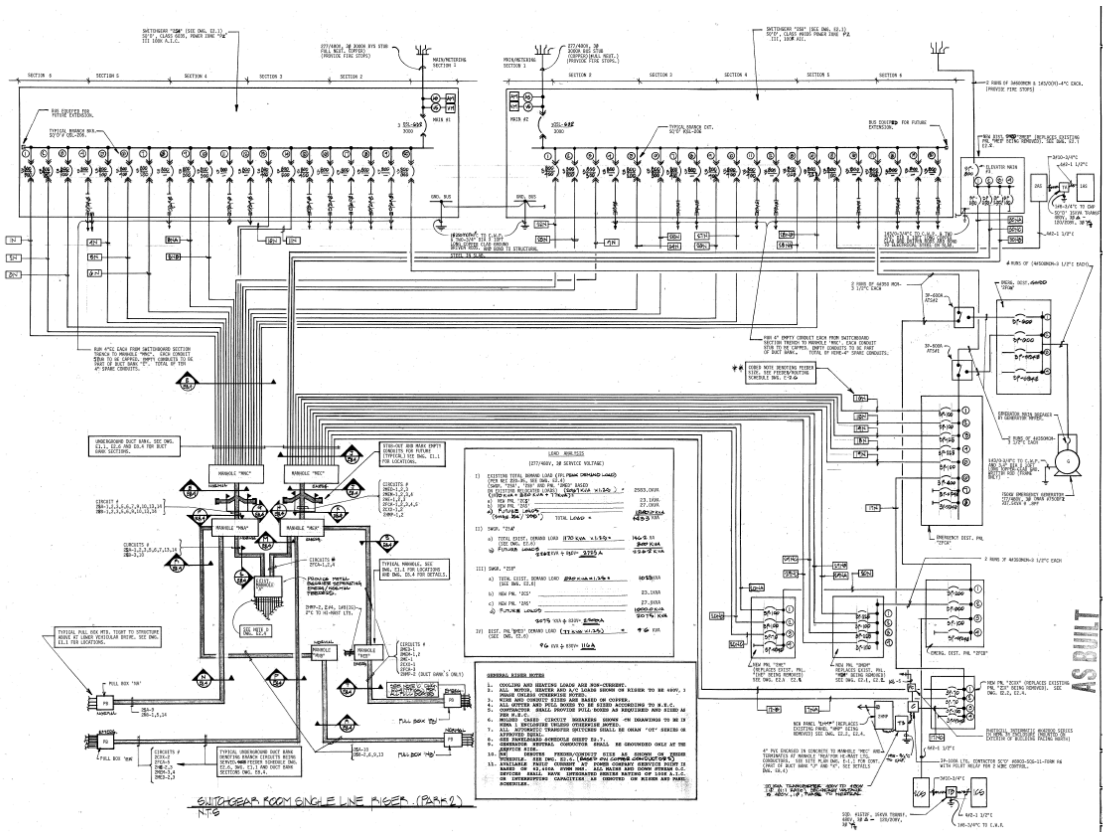

Figure 5.26 – Riser diagram for switchgear room.

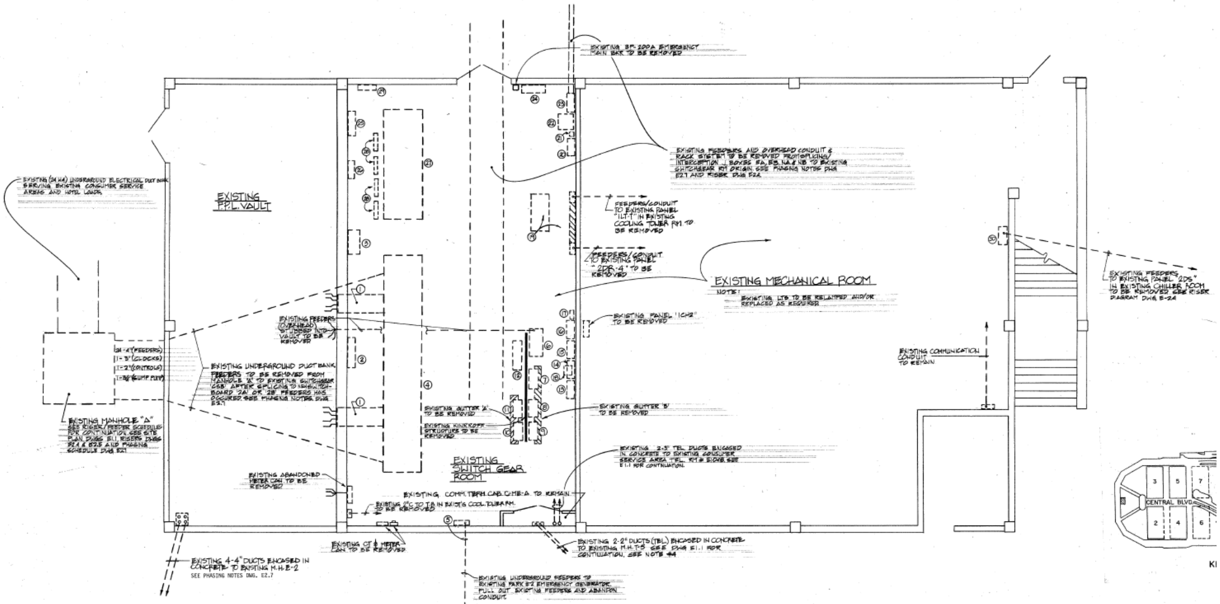

Figure 5.27 – SLD for switchgear and generator room. As-builts dated 1991.

Figure 5.28 – Panel schedule for switchgear

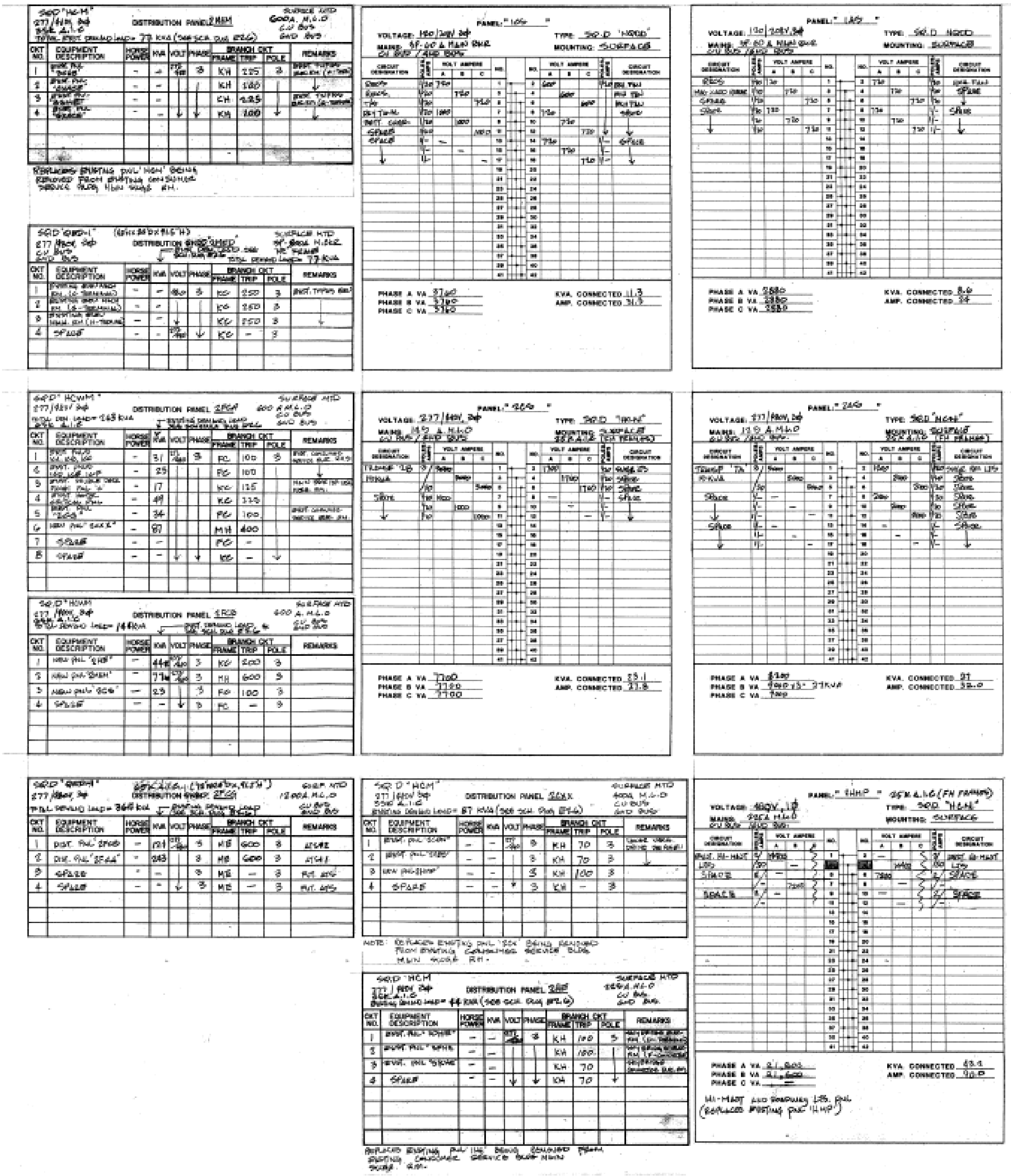

Figure 5.29 – Panel schedule for switchgear room devices

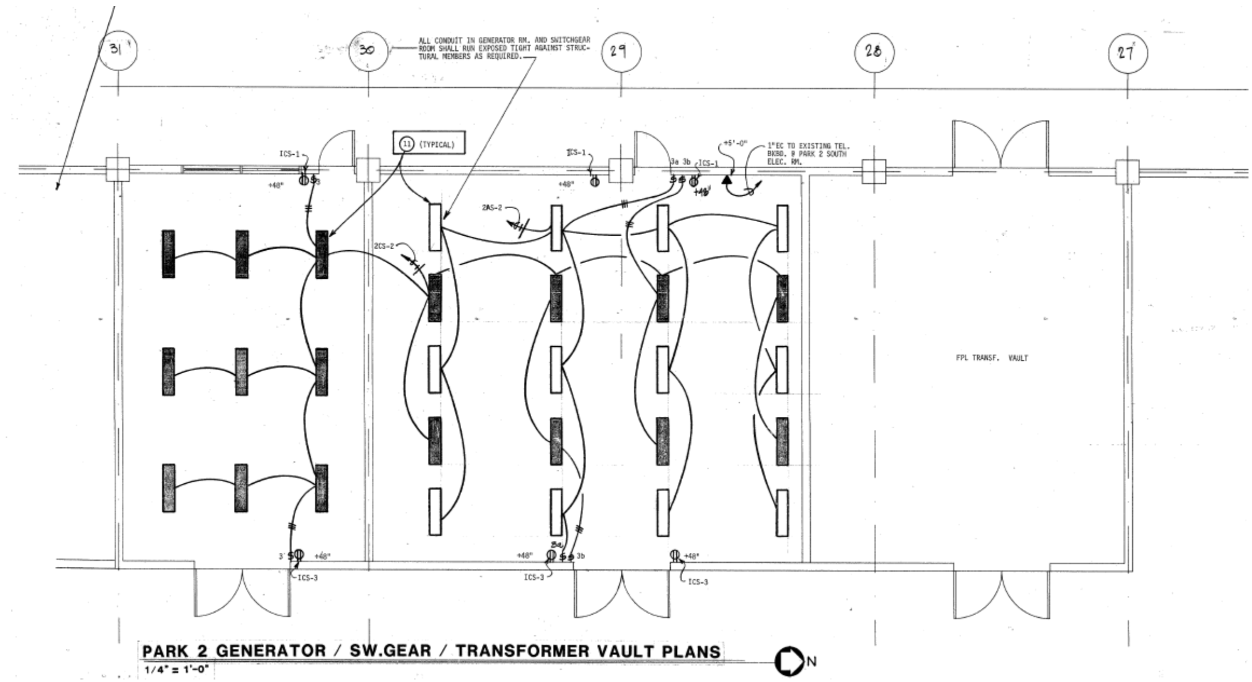

Figure 5.30 – Lighting diagram and layout of switchgear room, generator room, FPL vault.

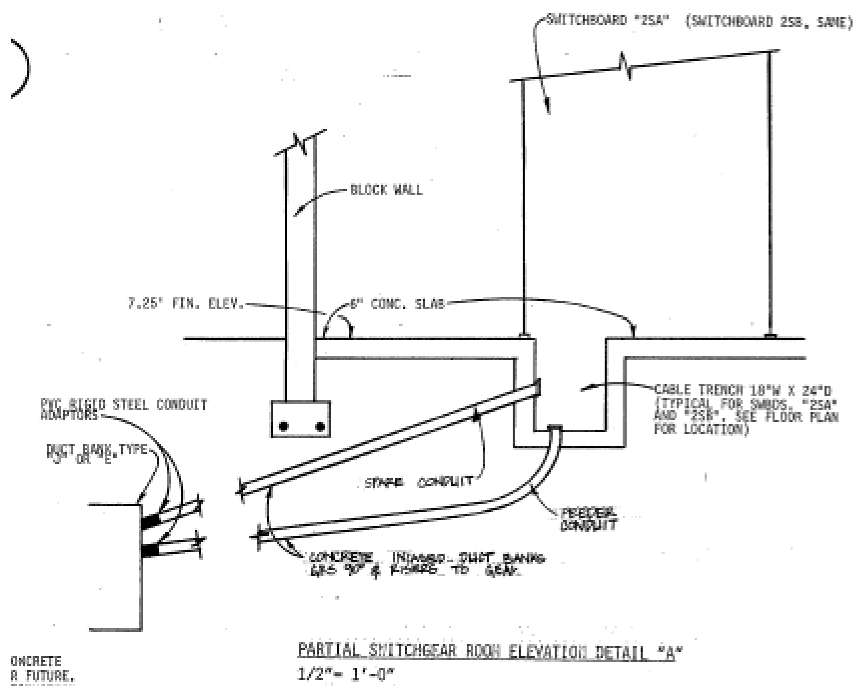

Figure 5.31 – Partial Switchgear room elevation detail

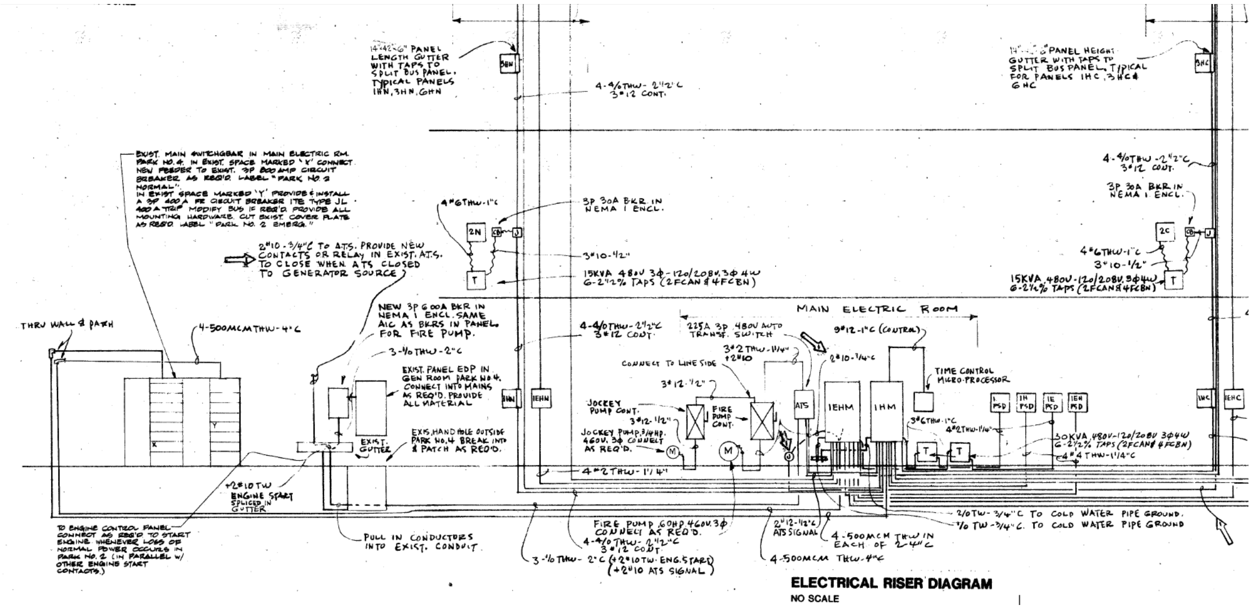

Figure 5.32 – Electrical riser diagram of switchgear room (from the 80's). This should be used for overall context, not existing conditions.

DISTRIBUTION PANEL "1 H M"

TYPE: GE CCB
SERVICE: 3Φ-4W
VOLTAGE: 277/480
MOUNTING: SURFACE

BRACE FOR 50,000 A.I.C.

MAIN BUS: 800A
NEUTRAL: 800A
* MAIN: 3P 800A TKM-8
LOCATION: TOP

CKT. NO.	EQUIPMENT DESIGNATION		CONN KVA	VOLTS	Φ	BRANCH CIRCUITS POLES	FR.	TR.	WIRE	COND	REMARKS
3	NORTH ELEV (1)		24.5	480	3	3	THED	70	3#2	1¼	
2	SPARE BKR		-	480	3	3	THED	100			
5	SOUTH ELEV (3)		24.5	480	3	3	THED	70	3#2	1¼	
1	TRANSF FOR 1PSD		30	480	3	3	THED	50	3#6	1"	
7	PANEL 1HPSD		59.1	277/480	3	3	THED	90	4#4	1¼	
	SPACE ONLY		10			3	THED				
4	PANELS 1HN,3HN,6HN+TRANSF		132.8	277/480	3	3	TFJ	225	4-4/0	2½	
8	PANELS 1HC,3HC,6HC+TRANSF		87.3	277/480	3	3	TFJ	225	4-4/0	2½	
6	PANELS 1HS,3HS,6HS+TRANSF		96.7	277/480	3	3	TFJ	225	4-4/0	2½	
2	FIRE PUMP		62.2	480	3	3	TJKG	600	3#2	1¼	
			10			3	THED				
			10			3	THED				

CONNECTED LOAD: 586.1 KVA
706 AMP @ 480V.-3Φ

* PROVIDE SHUNT TRIP RATED FOR SERVICE ENTRANCE

FEEDER: 2 RUNS OF 4-500 MCM THW - 4"C. (EACH)
FEEDER FROM: MAIN SW. GR. - PARK No. 4

DISTRIBUTION PANEL "1 E H M"

TYPE: GE CCB
SERVICE: 3Φ-4W
VOLTAGE: 277/480
MOUNTING: SURFACE

BRACE FOR 50,000 A.I.C.

MAIN BUS: 600A
NEUTRAL: 600A
* MAINS: 3P 400A TJJ4
LOCATION: TOP

CKT. NO.	EQUIPMENT DESIGNATION		CONN. KVA	VOLTS	Φ	BRANCH CIRCUITS POLES	FR	TR	WIRE	COND	REMARKS
3	PANELS 1EHN & 6EHN		61.8	277/480	3	3	THED	100	4#2	1¼	
5	PANELS 1EHC & 6EHC		54.6	277/480	3	3	THED	100	4#2	1¼	
2	PANELS 1EHS & 6EHS		59.4	277/480	3	3	THED	100	4#2	1¼	
6	NORTH ELEV (1)		34.0	480	3	3	THED	70	3#2	1¼	
7	SOUTH ELEV (3)		34.0	480	3	3	THED	70	3#2	1¼	
4	PANEL 1EHPSD		60.4	277/480	3	3	THED	90	4#4	1¼	
1	TRANSF. FOR PANEL 1EPSD		30.0	480	3	3	THED	50	3#6	1"	
	SPACE ONLY					3	THED				
	" "					3	THED				
8	CENTER ELEV. (2)		68.0	480	3	3	THED	125	3-1/0	1½"	

CONNECTED LOAD: 40[illegible] KVA
DEMAND OF .9 & DIVERSITY OF .18 = 307
370 AMPS @ 480V, 3Φ

FEEDER: 4-500 MCM THW - 4"C.
FED FROM: MAIN SW. GR. - PARK No. 4

* PROVIDE FOR SHUNT TRIP, RATED FOR SERVICE ENTRANCE

Figure 5.33 – Panel schedule of main distribution panels (from the 80's). This should be used for overall context, not existing conditions.

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