



AGENDA REPORT

SAN CLEMENTE CITY COUNCIL MEETING

Meeting Date: August 16, 2022

Agenda Item 4H

Approvals:

City Manager ES

Dept. Head [Signature]

Attorney CJ

Finance [Signature]

Department: Public Works / Engineering
Prepared By: Amir K. Ilkhanipour, Principal Civil Engineer

Subject: *PURCHASE OF A STANDBY GENERATOR AND ELECTRICAL DISTRIBUTION SYSTEM FROM CATERPILLAR INC. FOR THE CITY HALL BUILDING, PROJECT NO. 10546*

Fiscal Impact: Yes. The City previously received a grant in the amount of \$300,000 from the California Office of Emergency Services' Community Power Resiliency Allocation program to purchase a standby generator and related electrical distribution systems for the City Hall Building. The estimated equipment cost of \$350,000 is available from the CalOES grant in the amount of \$300,000 and from Public Facilities Fund Account No. 030-818-05300-000-10546, in the amount of \$50,000

Summary: Staff recommends that the City Council approve a purchase order with Caterpillar Inc. (CAT) in an amount of not-to-exceed \$350,000 to procure a standby generator and related electrical distribution systems for the City Hall Building.

Background: On April 20, 2021, the City Council accepted a grant from the California Office of Emergency Services' Community Power Resiliency Allocation program and allocated the grant to the Orange County Sheriff Department (OCSD) Substation project budget (Attachment 2). City staff is in the process of having the entire system designed and this is the first phase of the work. The generator and other electrical components need to be procured first, in order to meet a deadline for the grant. The project will improve the power system reliability in case of an emergency and power outage.

Based on a Preliminary Design Report (Attachment 3) prepared by a Michael Baker International, a 350kW generator with a 72-hour run sub-base fuel tank, located at the northwest corner of the City Hall building, will provide sufficient operating power for the building to operate for 72 hours, including the OCSD Substation during a power outage.

The City of San Clemente is a member of Sourcwell, a National Purchasing Cooperative organization that streamlines the buying processes for public schools, municipalities and other governmental agencies. Contracts and vendors that are awarded through Sourcwell, are competitively procured to assist members to be compliant with local and state procurement requirements. Utilizing a Cooperative organization allows the City to save time and resources from preparing and conducting a formal bid process. Additional savings are also realized through competitive pricing. Staff recommends approval of this purchase order to Caterpillar Inc. under a Cooperative Agreement through Sourcwell (Attachment 4).

Plan and Policy

Consistency: The Action is consistent with Policy and Procedure 201-2-1, Purchasing Policies and Procedures for supplies, materials and equipment in that purchasing through a Cooperative Purchasing Agreement is permitted by Policy and Procedure 201-2-1, subsection 6.17.3

Recommended

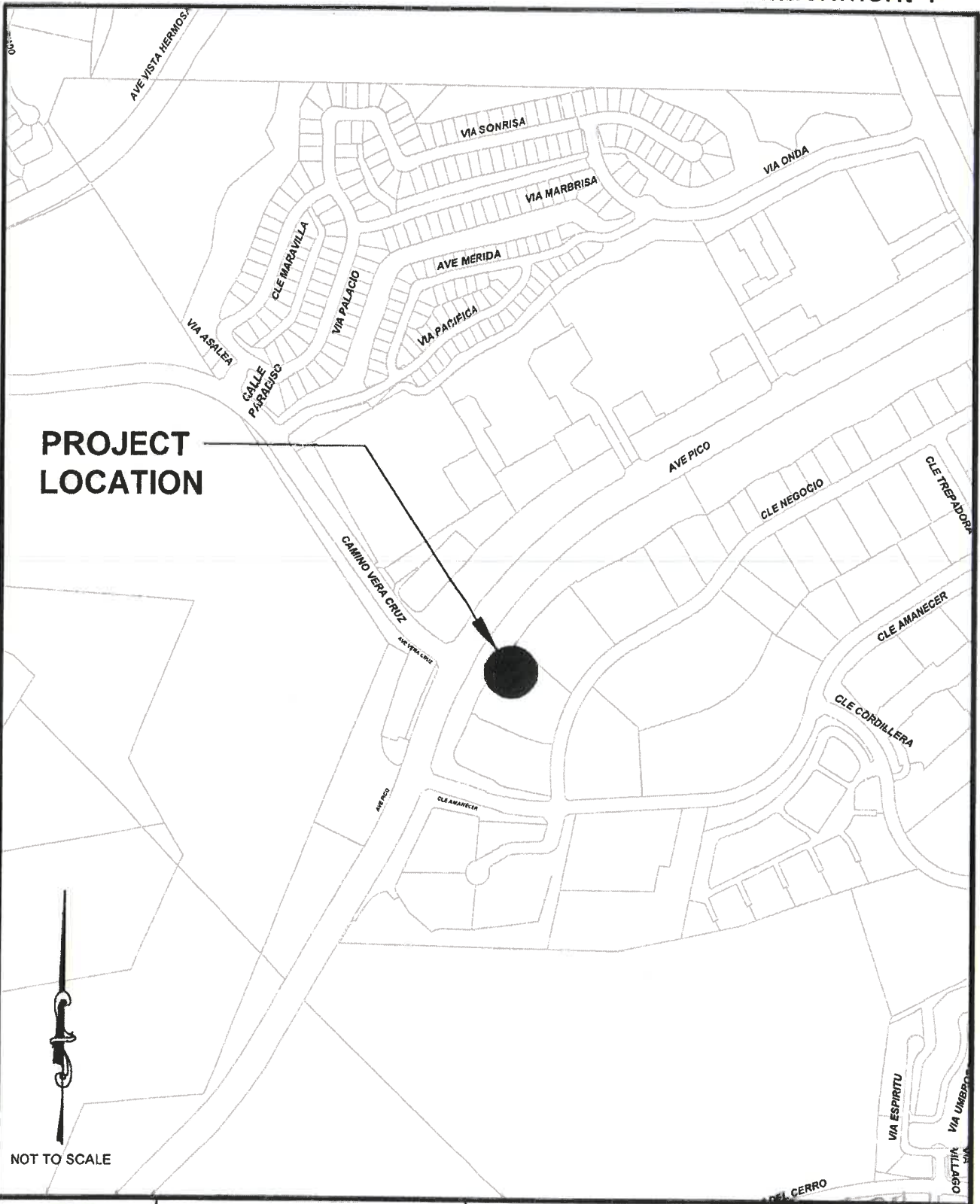
Action: STAFF RECOMMENDS THAT the City Council approve and authorize the Public Works Director / City Engineer to execute a purchase order with Caterpillar Inc. for a Standby Generator and Related Distribution Systems in accordance with the Sourcewell National Purchasing Cooperative Agreement Contract No. 120617-CAT in the amount not to exceed \$350,000 for the City Hall Building, Project No. 10546.

Attachments:

1. Location Map
2. Staff Report Dated April 20, 2021 (without attachments)
3. Preliminary Design Report
4. Sourcewell Cooperative Purchasing Agreement

Notification: None

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**PROJECT
LOCATION**



NOT TO SCALE

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City of San Clemente

910 Calle Negocio, Suite 100
San Clemente, CA 92673
Tel (949) 361-8100
Fax (949) 361-8316

LOCATION MAP

**Standby Generator Addition and
Electrical Distribution System Upgrade**

PN 10546



AGENDA REPORT

SAN CLEMENTE CITY COUNCIL MEETING
Meeting Date: April 20, 2021

Attachment 2

Agenda Item 6C

Approvals:

City Manager ES

Dept. Head TB

Attorney _____

Finance JW

Department: Public Works
Prepared By: Ziad Mazboudi, Deputy Public Works Director

Subject: RECEIVE STATE GRANT FUNDING FOR EMERGENCY GENERATOR FOR OCSD SUBSTATION PROJECT NO. 10546.

Fiscal Impact: Yes, this action will approve receipt of and allocate State grant funds in the amount of \$300,000 for the emergency generator for the OCSD Substation project.

Summary: This action is to formally receive State grant funds and allocate them to the OCSD substation project as discussed below.

Discussion: Staff applied for, and received, a grant from the California Office of Emergency Services' Community Power Resiliency Allocation program. A City Council resolution to submit the grant application was not pursued as the grant program did not require a resolution, and since the grant program did not require a commitment of local matching funds. As shared previously with the City Council, the grant will be used to procure an emergency backup generator and related electrical switchgear for the City Hall building, which includes the OCSD substation which is currently under construction. Since the City recently received a check for the entire grant amount, the recommended actions below formally accept the grant funds and allocate them to the OCSD Substation project budget.

Recommended

Action: STAFF RECOMMENDS THAT the City Council:

1. Receive State grant funds in the amount of \$300,000 for emergency generator for the OCSD Substation project to General Fund Account No. 030-000-33490-000-00000 (Other State Grants); and
2. Approve a supplemental appropriation in the amount of \$300,000 from the Public Facilities Construction fund balance to Account No. 030-818-45300-000-10546 (OCSD Substation Project No. 10546).

Attachment: None.

Notification: None.

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City of San Clemente
Standby Generator Addition and Electrical
Distribution System Upgrade

PRELIMINARY DESIGN REPORT

Prepared for:

City of San Clemente Public Works

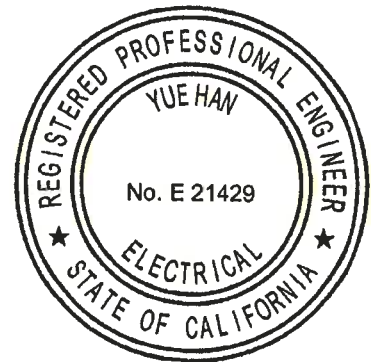


Prepared by:

Michael Baker International

5 Hutton Centre Drive

Santa Ana, CA 92707



Michael Baker
INTERNATIONAL

July 6, 2022



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- Exhibit 2 – Electrical Power Plan and Equipment Elevation
- Exhibit 3 – Generator, GDB and ATS Alternative 1 Site Plan



Exhibit 4 – Generator, GDB and ATS Alternative 2 Site Plan

APPENDICES

Appendix A – Engineer’s Opinion of Probable Construction Cost

Appendix B – Manufacturer Cut Sheets for Major Equipment

Appendix C – Generator Sizing Calculations

Appendix D – Southern California Air Quality Management District Forms

Appendix E – California Environmental Quality Act-Notice of Exemption Form

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1.0 EXECUTIVE SUMMARY

In order to improve the power system reliability in case of emergency and power outage, City of San Clemente (City) is in a process of planning to procure and install a stationary standby generator and have an electrical distribution system upgrade at the City Hall.

This preliminary design report identifies the basis of design for the generator, environmental and permitting considerations, and addresses different options for locating the generators on the existing site. The major factors that determine the outcome of the analysis is the existing site space limitations, the need to comply with South Coast Air Quality Management District (AQMD) and California Environmental Quality Act (CEQA) regulations, generator run-time and duty load during a power failure, and impact to the surrounding community during construction and operation.

A 350kW generator with 72-hour run sub-base fuel tank located in the northwest corner of the City Hall building and an outdoor generator distribution switchboard (GDB) along with four (4) auto transfer switches (ATS) installed exterior on the north side of the building is recommended. The generator was sized to provide sufficient power to four (4) 400 Amp metered switchboards.

The estimated construction cost for the new generator and electrical distribution system upgrade is approximately \$1,277,000, which includes a new 350kW generator set with 72-hour fuel tank, working platform, a new 800A GDB, four (4) ATS, modification of the existing 1600 Amps switchboard and associated site work. Detailed estimated construction cost break down is included in **Appendix A**.

Table 1 and **Table 2** list a summary of results coming from PDR discussion. Please refer to each section of this file for detail. The generator information as shown was provided by Caterpillar, GDB information was from SquareD and ATS was from ASCO. The equipment footprints, fuel tank capacities and costs are for reference only. Actual data is to be provided by the selected vendor.

Table 1 – Summary of PDR – Generator

Alternative	Equipment	Overall Dimension (ft)			Fuel Tank Capacity (gallon)	Standby Ratings (kW)	Material Costs + Labor	Occupied Parking Spaces
		Length	Width	Height				
1	350kW Generator w/Sound Enclosure and w/72-hour of sub-base fuel tank	20.9'	14.7'	10.5'	1844	72-hour at 100% Load	\$430,000	3
2	350kW Generator w/Sound Enclosure and w/48-hour of sub-base fuel tank	18.9'	6.7'	9.7'	1041	41-hour at 100% Load	\$360,000	3
	Standalone Day Tank with pump and accessories	8.0'	4.0'	5.3'	600	24-hour	\$55,000	1



Table 2 – Summary of PDR – GDB & ATS

Equipment	Overall Dimension (ft)			Material Costs + Labor	Occupied Parking Spaces
	Length	Width	Height		
800A NEMA 3R Generator Distribution Switchboard (GDB) with 800A main CB and four(4) 400A feeder breakers	5.5'	3.3'	7.6'	\$240,000	NA
400A NEMA 3R ATS	2.0'	1.5'	5.25'	\$40,000	NA



2.0 PROJECT DESCRIPTION

The San Clemente City Hall building consists of four (4) 400 Amp meter services. SDG&E transformer feeds the existing 1600 Amps multi-meter switchboard located in the electrical room on the first floor. Meter A is feeding two elevators, one chiller and common area loads. The other three meters (B, C and D) are providing power to each floor.

The City has selected Michael Baker International (Michael Baker) to provide a preliminary design report (PDR) for the installation of the Stationary Standby Generator and electrical distribution system upgrades at the building.

Based on the project objectives, this PDR will address the following:

- Evaluate the existing site and provide alternatives for generator installation.
- Identify electrical upgrades, including installation of GDB and ATS.
- Size and select a generator for the building.
- Identify environmental approval requirements.
- Identify necessary permits.
- Identify cost for overall construction.

The major factors that determine the outcome of the evaluation and analysis is the existing site space limitations, the need to comply with South Coast Air Quality Management District (AQMD) and California Environmental Quality Act (CEQA) regulations, generator run-time and duty load during a power failure, and impact to the surrounding community during construction and operation.



3.0 SITE VISIT

On March 14, 2022, Michael Baker engineers met the City staff at the City Hall to evaluate site condition and determine potential locations for the proposed generator, generator distribution switchboard (GDB) and automatic transfer switch (ATS). The existing 1600 Amps switchboard was inspected to determine how the proposed generator, GDB and ATS could connect to the existing gear.

The City Hall is located at 910 Calle Negocio, San Clemente, CA 92673. The site has two access road leading to the three stories building. The existing SDG&E transformer that is located at the north side of the building serves a 1600 Amps multi-meter switchboard. **Figure 1** shows the overall City Hall site. Proposed generator location is discussed in detail in Section 8.1.

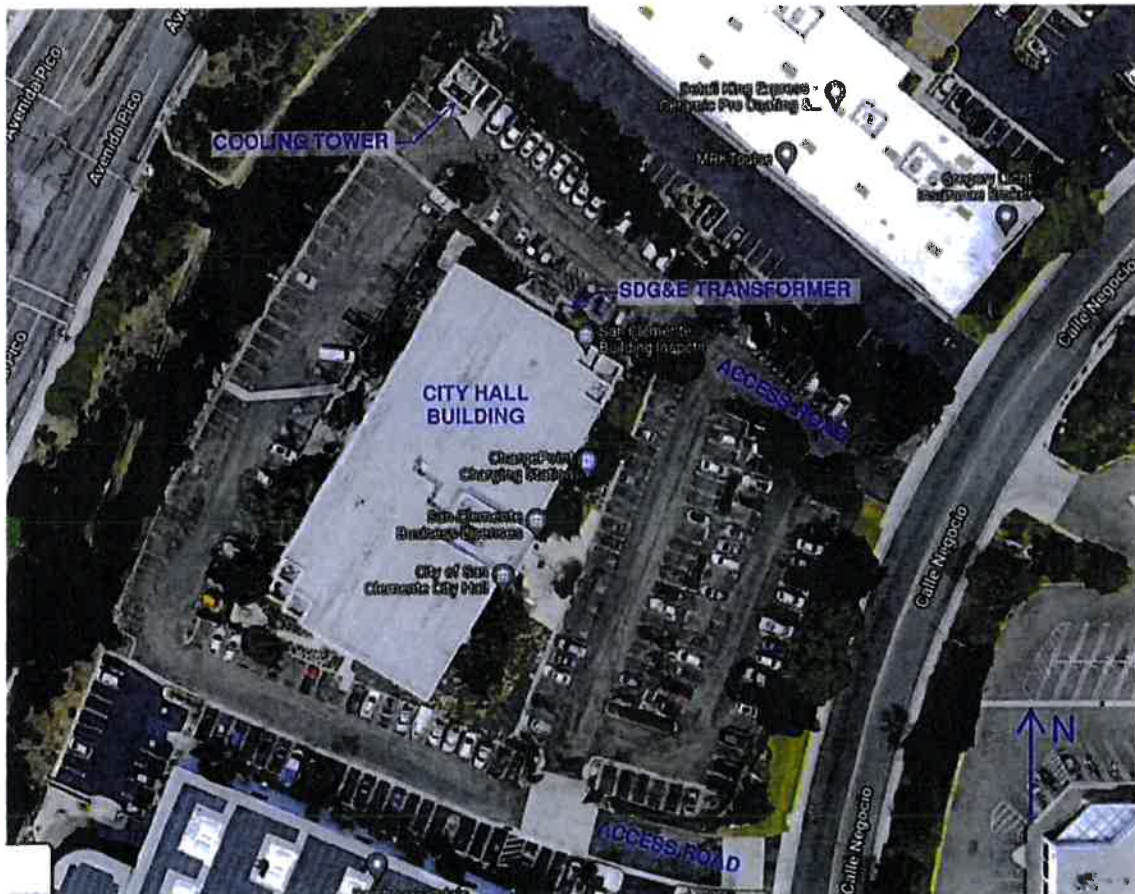


Figure 1 – City Hall Site Photo



4.0 ENVIRONMENTAL CONSIDERATIONS

4.1. AQMD

South Coast Air Quality Management District (AQMD) is the air pollution control agency for all of Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino Counties. AQMD is responsible for controlling emissions primarily from stationary sources of air pollution. These may include anything from large power plants and refineries to standby generators. AQMD requires permitting for all equipment that emits air contaminants such as oxides of nitrogen NO_x , carbon monoxide (CO), oxides of sulfur (SO_x), fine particulate matter (PM_{10}) or toxic substances and is installed, altered, replaced, or operated.

4.2. CEQA

The City of San Clemente (City) is the lead agency pursuant to the California Environmental Quality Act (CEQA) for this project. The City proposes to procure and install a stationary standby generator and upgrade the electrical distribution system at City Hall located at 910 Calle Negocio. The project site is currently used as surface parking for City Hall employees. The generator would be installed on a concrete foundation slab within a sound attenuation enclosure within the City Hall property. The generator would only be used during power outages and during maintenance and testing. The project proposes two engineering options: 1) a 350-kilowatt (kW) generator with 72-hour sub-base fuel tank; and 2) a 350kW generator with 48-hour sub-base fuel tank, and a 86 inch long, 48 inch wide, 64 inch high, standalone 24-hour double wall day tank.

4.2.1. Baseline Conditions

The project site is located within the central portion of the City of San Clemente, approximately 1.15 miles east of Interstate 5 (I-5), within the Rancho San Clemente Business Park area. Specifically, the project site is located within the northwest portion of City Hall (910 Calle Negocio) on an existing paved surface parking lot. The City of San Clemente's Rancho San Clemente Specific Plan (Specific Plan) designates and zones the project site as Light Industrial. Light Industrial and Private Open Space uses surround the project site. Within 100 feet of the proposed generator site, the topography ranges from approximately 200 feet to 240 feet in elevation above mean sea level. The site is approximately 230 feet in elevation. Ornamental landscaping including mature trees and shrubs adjoins the property. Up to five existing parking spaces would be eliminated with project implementation depending on generator alternatives.

4.2.2. Key Environmental Considerations

Aesthetics

Based on the City of San Clemente Centennial General Plan (General Plan), the City affords views of the Pacific Ocean to the west, hillsides and ridgelines to the north and east, coastal bluffs and beaches, and with a number of winding canyons traversing the City, offering diverse visual resources that provide relief from the built environment. Aesthetic resources include public views of natural landforms, the City's Spanish Village by the Sea urban form and colors, natural vegetation colors and textures, and the shoreline



and the Pacific Ocean. Based on General Plan Figure NR-1, Aesthetic Resources, west of the project site, Avenida Pico is designated as a major view corridor; south of the project site, Knob Hill is designated as a scenic vista; and southeast of the project site, the Rancho San Clemente Ridgeline Trail runs along a designated significant ridgeline (<https://www.san-clemente.org/departments-services/planning-services/long-range-planning/general-plan/general-plan-maps>). Near the project site, pedestrians, bicyclists, and motorists traveling along Avenida Pico are afforded views of the rolling open space and Spanish style development to the west and surrounding trees and vegetation. Pedestrians and bicyclists at Knob Hill and traveling along the Rancho San Clemente Ridgeline Trail affords views of the hillsides, ridgelines, canyons, and natural landforms as well as the urban development.

The proposed project site is located within a highly urbanized portion of the City, occupied by light industrial uses. The site is void of aesthetic resources and does not afford views of visual or scenic resources identified as sensitive within the General Plan. Project implementation would not obstruct the existing scenic views at designated scenic vistas or ridgelines due to the distance of the project site and the proposed location of the generator at the northwest portion of the City Hall property. The existing City Hall building would obstruct views of the new generator from Calle Negocio and existing topography and vegetation would obstruct views from Avenida Pico.

The height of the proposed generator enclosures, which would house the generator, fuel tank, and sound attenuation, would range in height from approximately 9.5 feet to 10.3 feet tall, depending on the sub-base fuel tank size. The surrounding structures are two- to three-stories in height (approximately 20 to 30 feet tall); therefore, the size of the generator enclosure would match the overall look and feel of the existing area. Additionally, the location of the proposed generator, at the northwest portion of the City Hall property, and onsite topography and vegetation would generally conceal most views of the generator from the adjoining properties and roadways.

Minimal, short-term construction activities could be visible to neighboring uses. Although intervening topography and vegetation would screen neighboring uses from the majority of the project's proposed construction activities, all grading and earthwork activities would be conducted in accordance with local, regional, and federal requirements and would be temporary in nature.

Air Quality

Air quality impacts associated with operation of the emergency generators would be nominal, as the generator would only be used during power outages and during maintenance and testing. Based on the South Coast Air Quality Management District (SCAQMD) and California Air Resources Board (CARB) guidelines, emergency/standby generators are limited in the amount of time they can operate in non-emergency situations such as testing or maintenance. The project would comply with SCAQMD permit requirements. Construction activities would be minor based on the scope of work. As such, short-term construction emissions are not anticipated to exceed the SCAQMD thresholds and would cease upon completion of the project.

Greenhouse Gases

Based on the California Code of Regulations, Title 17, CCR, Section 95101 (17 CA ADC § 95101), emergency



generators are exempt from greenhouse gas (GHG) emissions reporting for generating units designated as backup or emergency generators in a permit issued by an air pollution control district or air quality management district (in this case, SCAQMD). Thus, this project is exempt from GHG emissions reporting.

Noise

The proposed generator would be placed in a sound attenuation enclosure, and the generator would only be used during power outages and during maintenance and testing. Maintenance and testing would not occur during nighttime hours. This analysis assumes that proposed sound attenuation enclosure would be capable of reducing noise such that an exceedance of local City standards at adjoining properties would not occur. Construction activities generally are temporary and have a short duration, resulting in periodic increases in the ambient noise environment. Based on Chapter 8.48, Noise Control, of the City of San Clemente Municipal Code (Municipal Code), noise sources associated with construction activities are exempt from the provisions of City noise regulations, provided said activities take place only between the hours of 7:00 a.m. and 6:00 p.m. on Monday through Friday, between the hours of 8:00 a.m. and 6:00 p.m. on Saturday, and at no time on a Sunday or a City-recognized holiday, and provided all grading activities also comply with Section 15.36.190 of the City's Municipal Code regarding time of grading operations. The project site is located within one-half mile of residential uses; therefore, per Municipal Code Section 15.36.190, grading and equipment operations shall not be conducted between the hours of 5:30 p.m. and 7:30 a.m. nor on Saturdays, Sundays and City-recognized holidays. The project would adhere to City regulations as well as State and federal guidelines and would use best management practices to reduce construction related noise, including maintaining mufflers and other noise attenuation devices, noticing, and directing construction equipment and staging areas away from sensitive noise receivers.

Hazards and Hazardous Materials

An above ground fuel tank (AST) would be installed per the currently adopted design guidelines and in accordance with applicable ASTM International (ASTM) Standards. It is acknowledged that the Orange County Health Care Agency is the Certified Unified Program Agency (CUPA) for the City under the Unified Program (Senate Bill 1082). As such, installation and maintenance (including regular inspections) of the AST would be conducted on a routine basis in accordance with existing laws and regulations to minimize risk of upset to human health in relation of hazardous materials

Biological Resources

Tree and shrub clearing may occur during project construction. If construction occurs during the bird nesting season (typically January through July for raptors and February through August for other avian species), then pre-construction surveys will be required to determine the presence of nesting birds and biological monitoring may be required.

Recommendations

In conjunction with satisfying compliance documentation requirements for CEQA, it is anticipated that this project will be eligible to receive a Categorical Exemption under Title 14, Division 6, Chapter 3, Section



21084 of the Public Resources Code.

The project falls under Section 15303, New Construction or Conversion of Small Structures, of the CEQA Guidelines. Based on the Guidelines, Class 3 includes the construction of new, small facilities or structures, and installation of small new equipment and facilities in small structures. The generator will only be operated during emergency, maintenance, and testing activities. The proposed emergency generator would help increase system reliability during power outages to benefit the residents of the City, and do not propose a land use change.

Under CEQA, this project would require preparation of a Notice of Exemption (NOE) for filing with the County Clerk. As the project would be considered exempt from CEQA, there would be no public review requirement or technical analysis required.



5.0 PERMITS

5.1. AQMD

All emergency/standby generators with engines greater than 50 brake horse power (bhp) are required to obtain an AQMD permit prior to installation. The design will be based on an engine that has been certified by the AQMD and the EPA to meet FEMA requirements. A diesel fueled engine generator, certified by the AQMD, has been proven to meet all applicable air quality requirements. The unit is located at least 1,000-ft from a school (K-12). There is no sensitive receptor within 100 meters boundary and a diesel particulate filter (DPF) is not necessary. The required blank permit forms are included in **Appendix D**.

Michael Baker can file or assist the City with filing under separate scope and fee. This item can be included in the final design scope of work.

5.2. CEQA

Under CEQA, this project would require preparation of a Notice of Exemption (NOE) for filing with the County Clerk. As the project would be considered exempt from CEQA, there would be no public review requirement or technical analysis required. The blank NOE form is included in **Appendix E**. Michael Baker can prepare the NOE and file the NOE with the County Clerk if requested by the City under a separate scope and fee. This item can be included in the final design scope of work.

5.3. Fire Code

Chapter 57 of the 2019 California Fire Code (CFC) requires a minimum distance from the property line and nearby building structures for aboveground fuel storage tanks. In addition, where these tanks are subject to vehicular impact, proper measures to protect the tank are required.

The storage tank for this project falls under Section 5704.2.9.6, Above-ground tanks outside of buildings. The storage tank will be designed with a venting system to limit the pressure within the tank to 2.5 psig or less; therefore, it falls under Section 5704.2.9.6.1.1 of the CFC. Section 5704.2.9.6.1.1 of the CFC refers to Table 22.4.1.1(a) and 22.4.1.1(b) of NFPA 30, which specifies the minimum distance a tank must be from a property line and from the nearest important building on the same property, depending on the size of the tank, type of tank and fire protection of adjacent structures.

For a standard (UL 142) tank on a property that has fire protection provided by a public fire department, the distance is the value in Table 22.4.1.1(b). For a protected aboveground tank, defined as an atmospheric aboveground storage tank with integral secondary containment and thermal insulation that has been evaluated for resistance to physical damage and for limiting the heat transferred to the primary tank when exposed to a hydrocarbon pool fire and is listed in accordance with UL 2085, the minimum offset from the property line is reduced to 50% of the value in Table 22.4.1.1(b), but not less than 5-feet, as summarized in **Table 3** and **Table 4** below.



Table 3 – Summary of Property Line Offsets per NFPA 30

Tank Capacity (gallons)	Minimum Distance from Property Line (feet), UL 142 tank	Minimum Distance from Property Line (feet), UL 2085 tank
275 or less	5	5
276 to 750	10	5
751 to 12,000	15	7.5

Table 4 – Summary of Nearest Important Building Offsets per NFPA 30

Tank Capacity (gallons)	Minimum Distance from Nearest Building (feet), UL 142 tank	Minimum Distance from Nearest Building (feet), UL 2085 tank
275 or less	5	5
276 to 750	10	5
751 to 12,000	15	7.5

A UL 2085 tank is a double-wall fire protected above ground storage tank that features an inner and outer steel tank with a lightweight thermal insulation material that exceeds the UL 2-hour fire test. These tanks are custom made for each generator set and will increase the height of fuel tank and therefore the overall height of the generator enclosure. The cost for the UL 2085 is typically about twice the cost of a UL 142 tank. Due to the cost and to be conservative when evaluating space for alternatives, a UL 142 tank is assumed for this evaluation. Section 5704.2.9.7.5 requires vehicle impact protection where protected above-ground tanks are subject to vehicular impact. The requirement can be satisfied either by having the impact protection incorporated into the system design in compliance with the impact test protocol of UL 2085, or by meeting the provisions of Section 312. Section 312 of the CFC requires either posts or other barriers capable of withstanding a force of 12,000 pounds. To fulfill this requirement, bollards will be installed to protect the tank.

5.4. Building and Safety

City of San Clemente Department of Public Works Building and Safety Department typically reviews electrical drawings via plan check for generators having a disconnecting means rated 400A or more. If requested by the City, Michael Baker can assist with the plans and an application submittal to the City’s Building and Safety for approval during final design.



6.0 DESIGN CRITERIA

6.1. Codes and Standards

The electrical work associated with the stationary standby generator upgrades include the electrical design of a new generator set, a generator distribution switchboard (GDB), four (4) automatic transfer switch (ATS), connection to the existing 1600 Amps switchboard, and all associated feeder conduits and conductors. The design will conform to the latest editions of the following applicable standards and codes:

- National Electrical Code (NEC 2020 Edition) (NFPA 70)
- Life Safety Code (NFPA 101)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
- Institute of Electrical and Electronics Engineers (IEEE)
- Illuminating Engineering Society of North America (IESNA) Lighting Handbook
- American National Standards Institute (ANSI)
- International Electrical Testing Association (NETA)
- Occupational Safety and Health Act (OSHA)
- National Electrical Manufacturers Association (NEMA)
- Underwriters Laboratories (UL)
- Factory Mutual (FM)
- Insulated Cable Engineers Association (ICEA)
- Southern California Edison (SCE) Underground Structure Standards (UGS)

Where the requirements of more than one code or standard are applicable, the more restrictive one will govern.

6.2. Generator

The following section discusses how the requirements outlined in Section 4.0 (AQMD, CEQA, and impact to the surrounding community during construction) are incorporated into the design and selection of the generator, the associated items, and the electrical system.

6.2.1. Emissions Regulation and Criteria

The California Air Resources Board (CARB) is a part of the California Environmental Protection Agency (Cal EPA), an organization that reports directly to the Governor's Office in the Executive Branch of California State Government. The purpose of CARB is to promote and protect public health, welfare and ecological resources through the effective and efficient reduction of air pollutants while recognizing and considering the effects on the economy of the state. In addition to CARB, air pollution in California is addressed at the local level by one of 35 air pollution districts; Southern California Air Quality Management District (AQMD) in this case. Each district establishes and enforces air pollution regulations to attain and maintain all state and federal ambient air quality standards. The districts control and permit emissions from stationary sources of air pollution, and each district adopts its own rules and regulations to combat the air quality problems within its region.



Locally, AQMD Rule 1470, Requirements for Stationary Diesel-Fueled Internal Combustion, regulates standby generators. Under CARB/AQMD generators engines are categorized by tiers (1 through 4) depending on use and size (model year and horsepower rating of the engine). Generally, engines rated 175 bhp and over fall under Interim Tier 4. However, those utilized for standby/emergency power are exempt from Tier 4 standards, but are limited in the amount of time they can operate in a non-emergency situation such as testing or maintenance. SCAQMD Rule 1470 defines an emergency standby engine as an engine that is not the source of primary power, is operated during an emergency use, does not supply power to the electric grid, does not supply power as part of a financial agreement with any entity, is operated under limited circumstance for maintenance and testing, and is operated under limited circumstance in response to an impending outage.

The current limit for operation of standby generator is 200 hours yearly, which includes a maximum of 50 hours for testing and maintenance. Operation over 200 hours in a year may result in a notice of violation and a fine. However, with proper justification, the operator can petition AQMD to operate in excess of 200 hours prior to reaching the 200 hours limit. Excess hours are granted on a case by case basis; if adequate data is available to support that the generator has only been operated as standby, excess hours are likely to be granted.

Sensitive receptors such as residence, schools, hospitals etc are beyond 100 meters of the new standby generator. Therefore, the generator doesn't require diesel particulate filter (DPF).

6.2.2. Generator Sizing

The generator is sized based on the utility company (SDG&E) billing provided by the City. Michael Baker selected the highest peak load demand of each meter of 2020-2021 and summarized below in **Table 5**.

In this application, the generator set is sized to pick up all the electrical loads in a single step. A detailed generator sizing calculation is included in **Appendix C**. Preliminary analysis based upon the loads result in a 350kW (Caterpillar C13) engine for the City Hall building.

Table 5 – City Hall Building Electrical Loads

Meter	Load (kW)	FLA (A)
A	122.7	185
B	46.4	70
C	48	72
D	42.1	63
TOTAL	259.2	390

6.2.3. Fuel Volume and Storage Tanks

The City requested 72-hour 100% loaded run time for 350kW generator. The actual run time will depend on the running electrical load and will increase if the generator is not operated at full load. See **Table 6** under Section 8.1 for generator run time calculation. The fuel tank will meet the necessary NFPA 30, California Fire Code, and ASTM requirements and have the appropriate UL listings (UL 142).



6.3. Electrical System

6.3.1. GDB

A Generator Distribution Switchboard (GDB) is required to distribute generator power to individual services. Based on generator size and the maximum output amps, the system will need an 800A, 480/277V, 3-Ph, 4W switchboard with a 800A/3P main circuit breaker and four (4) 400A circuit breakers. Manufacturer information from SquareD is included in **Appendix B** for GDB.

6.3.2. ATS

Automatic Transfer Switch (ATS) is necessary to provide automatic transfer to temporary electrical power if the utility source fails. This equipment functions to switch load between two sources when it senses one of the sources has lost or gained power. Because the City Hall building has multiple service disconnects, the building will need four (4) 400A ATS in total to be able to transfer power sources individually. Manufacturer information from Asco is included in **Appendix B** for ATS units.

6.3.3. Enclosure Types

The new switchboard and transfer switches will be installed at outdoor location of the City Hall building. Enclosure shall be NEMA 3R rated, unless otherwise requested by the City.

6.3.4. Electrical Raceways

The proposed design will attempt to minimize the requirement for new electrical conduit by placing the generator and ATS in close proximity to the existing 1600 Amps distribution switchboard, where practical.

A new raceway will be installed for new generator power and control conduits installation. New conduits shall be schedule 40 PVC for below grade, and rigid galvanized steel for interior locations and PVC coated rigid steel for above grade exterior locations. Where needed, waterproof flexible conduit will be used for final connections to vibrate equipment. Conduits shall be segregated as follows:

- Power wiring below 600 volts and below.
- Control wiring 120 volts and below.
- Discrete instrumentation wiring.
- Analog instrumentation wiring.
- Communication wiring.

New conduits will be sized based on NEC requirements for the number and size of cables contained. The following minimum sizes shall be used:

- 3/4-inch minimum diameter for conduit installed exposed on indoor walls and ceiling.
- 1-inch minimum diameter for underground and exterior conduits.

6.3.5. Wire and Cable

Stranded copper conductors will be used for all circuits greater than size 10 AWG. The requirements for the cables and conductors are as follows:



General

Conductors and cables shall be new, single conductor, copper, not smaller than #14 AWG (except shielded instrumentation control wire) unless indicated otherwise on the Drawings. Aluminum conductors and cables are not acceptable.

Conductor insulation shall bear manufacturer's trademark, insulation designation, voltage rating, and conductor size at regular intervals. Each type of conductor or cable shall be the product of a single manufacturer. The new cables for power and control wiring shall be type XHHW-2.

Conductors Smaller than 250 MCM

Conductors smaller than 250 MCM for power service, power feeders, power circuits and control circuits shall be stranded copper, rated 600 volts, with 90°C XHHW-2 or THHN/THWN-2 insulation, UL approved, for installation underground, in concrete, in masonry, or in wet locations.

Conductors 250 MCM and Larger

Conductors 250 MCM and larger shall be stranded copper, rated 600 volts, with 90°C XHHW-2 insulation or THHN/THWN-2, UL approved, for installation underground, in concrete, in masonry, or in wet locations.

The conductor maximum amp capacity shall be per NEC table 310.15(B)(16).

6.3.6. Grounding Systems

The power systems grounding will be designed to meet the NEC requirements as measured by the fall-of-potential method. The grounding systems will include connections to the existing grounding system where available as well as installation of new grounding equipment where needed to supplement the existing system. The new grounding equipment will include buried bare copper ground ring conductors, ground rods, and connections to major rebar in equipment pads, water pipes, electrical equipment, separately derived sources, and local ground buses.

The grounding electrode system will have maximum resistance of 5 ohms for the electrical system.

6.3.7. Electrical Equipment

The existing 1600 Amps multi-meter switchboard and the existing 200A, 480/277V, 3-Ph panelboard requires modification work to accommodate generator power addition. Refer to **Exhibit 1** for single line diagram. Refer to **Exhibit 2** for existing 1600 Amps multi-meter switchboard elevation and modification details.



Modification to the existing 1600 Amps multi-meter switchboard includes:

- Existing cable cutting
- Installing new power distribution block at the bottom of the switchboard.
- Remove four existing load circuit breakers of the switchboard Section A to fit new ATS cables.

Modification to the existing panelboard HL includes:

- Installing four new circuit breakers in panel HL and reconnect to the existing load.



7.0 Controls, and Alarms

7.1.1. Local Controls

The new generator will have its own local control panel, that could provide monitoring signals of critical generator components for operation and alarming functions as well as ethernet communications for additional information to monitor not critical aspects of the generator.

Local control of the generator will be via a control panel mounted on the generator. The local controls should consist of indicating lamps for operations and alarms and hand switches for the manual operation of the generator. There should be displays noting the generator fuel level, generator battery voltage, cooling water temperature, oil pressure, generator voltage, current, frequency, and power. The displays can be meter gauges or a digital display.

The transfer switch should have a graphic display to monitor the operations of the transfer switch and provide control functions for testing the transfer switch functions such as loaded and unloaded generator testing. The display should allow for the configuring of generator start delays, cool down times, and transfer switch functions.

7.1.2. Remote Monitor and Controls

Remote monitor and control of the generator will be via

1. Annunciator panel. An annunciator panel can be mounted inside the building where accessible to technician/staff. The panel could provide simple status and that would alert trouble at the generator.
2. Manufacturer supported service. The second option is to have the generator control panel connect to manufacturer supported remote monitoring means (i.e. Caterpillar has remote HMI display option and remote monitoring software option). Maintenance staff could remotely monitor the generator status through remote display or Windows based operating system.

Remotely monitor of the ATS is not available because of the building doesn't have PLC or RTU to receive ATS status signals.

Michael Baker will provide detailed generator control design in final design service.



8.0 PROJECT DESIGN ALTERNATIVES

8.1. Generator and storage fuel tank

The proposed 350kW diesel generator to be mounted in a sound attenuation enclosure. Based on the 72 hours generator run time requested by the City and property line offset and building offset requirement by NFPA 30, the above-ground fuel tank has two options. One is to have an 1800-gallon¹ sub-base tank for 72 hours of run time or a 1200-gallon¹ sub-base fuel tank for 48 hours of operation and a separate 600-gallon double wall day tank for additional 24 hours of operation. **Exhibit 3** and **Exhibit 4** show site plan of alternative generator and day tank locations. Relationship of generator run time and percentage of loading is shown in **Table 6**.

Table 6 –Generator Run Time Calculation

350kW Generator	
Generator Run Time with 72-hour Sub-Base Fuel Tank	
100% loaded	72 hours
74% loaded (current maximum load)	97 hours
50% loaded	144 hours
Generator Run Time with 48-hour Sub-Base Fuel Tank	
100% loaded	48 hours
74% loaded (current maximum load)	64 hours
67% loaded	72 hours
50% loaded	96 hours

8.1.1. Alternative 1

Alternative 1 is to install a 350kW generator with 72-hour sub-base tank in the northwest corner of the City Hall building. The fuel tank is being placed to have sufficient offset from the property line and from the building to meet the fire code requirements. See **Exhibit 3** for layout.

8.1.2. Alternative 2

Alternative 2 is to install a 350kW generator with 48-hour sub-base tank in the northwest corner of the City Hall building and a separate 24-hour day tank next to the generator. Advantages and disadvantages of this option are discussed in Section 9.0. See **Exhibit 4** for layout.

8.1.3. Alternative 3

Alternative 3 is to install a 350kW generator with 48-hour sub-base tank in the northwest corner of the City Hall building. Per **Table 6** as shown above, when generator is 67% loaded (approx. 234kW) or less, a 48-hour fuel tank could provide a minimum of 72 hours of run time. Michael Baker has discussed this

¹ Note: Sub-base fuel tank capacity is an estimate only, actual tank size varies by manufacturer and depends on generator fuel consumption rate.



alternative with the City and the City has decided to proceed with Alternative 1 and Alternative 2.

8.1.4. Natural Gas Engine Alternative

A natural gas engine could be provided in lieu of a diesel engine. The advantages and disadvantages of a natural gas engine are listed in **Table 7**. A natural gas engine is not recommended, primarily because it is susceptible to an outage during an emergency and does not fit well within the site constraints.

Table 7 – Natural Gas Evaluation

Natural Gas Advantages	Natural Gas Disadvantages
Natural gas is a cleaner burning fuel than diesel. No particulate filter required.	Natural gas distribution line is susceptible to damage during an earthquake or fire and therefore the generator may not be available.
No fuel storage tank required.	Natural gas engine footprint is approximately twice as large as diesel. Does not fit within proposed area.
Refueling is not required since there is a dedicated fuel source.	Typically requires a dedicated 4-inch medium pressure gas service, which may not be available at the site.
	Natural gas engine is approximately twice the cost of diesel engine.

8.2. GDB and ATS

Based on input from the City and due to limited space within the City Hall buildings lot, GDB and four ATS can be mounted either outdoor close to the existing SDG&E transformer or indoor on the second floor electrical room.

8.2.1. Alternative 1

Alternative 1 is to have GDB and ATS lined up at the north side of the City Hall building outside of the first-floor electrical room. The equipment will be located more than 5-feet from the back side of the SDG&E transformer to meet SDG&E requirements. Advantages and disadvantages of this option are discussed in Section 9.0. **Exhibit 3** shows GDB and ATS locations.

8.2.2. Alternative 2

Alternative 2 is to have GDB and ATS located face to face at the north side of the City Hall building outside of the first-floor electrical room. The equipment will be located more than 5-feet from the side and back side of the SDG&E transformer to meet SDG&E requirements. Advantages and disadvantages of this option are discussed in Section 9.0. **Exhibit 4** includes site plan of alternate GDB and ATS locations.



8.2.3. Alternative 3

Alternative 3 is to have GDB and ATS installed on the building second floor electrical room. There is a dedicated empty room for electrical equipment installation. However, this alternative is not recommended. The installation of new electrical gear on the second floor and routing multiple power and control conduits and cables from the outdoor generator to the second floor electrical gear through the building floor and walls will make construction difficult. The second floor empty room space can be used for future electrical equipment.



9.0 RECOMMENDATIONS

The advantages and disadvantages of each option are summarized in **Table 8**. Detailed estimates of probable construction cost for each option are included in **Appendix A**.

Table 8 – Summary of Design Alternatives

Alternative	Advantages	Disadvantages
8.1.1* (page 20) 350kW generator with 72-hour sub-base fuel tank	<ul style="list-style-type: none"> Proposed location is flat and will require minimum grading Generator and 72-hour tank fit within existing City Hall lot Occupy less parking spaces (3) Smaller footprint No need for additional space for fuel tank No need for additional conduits/piping/cables between day tank and generator set No need for fuel pump and appurtenances No need for extra concrete foundation for day tank 	<ul style="list-style-type: none"> Platform is required
8.1.2 (page 20) 350kW generator with 48-hour sub-base fuel tank and a separate 24-hour day tank	<ul style="list-style-type: none"> Proposed location is flat and will require minimum grading Platform is not required. 	<ul style="list-style-type: none"> A separate day tank means extra effort of maintenance and repair. Footprint of generator and the day tank will occupy more parking spaces (4). Larger footprint Require additional conduits/piping/cables between day tank and generator set Require additional fuel pump
8.2.1 (page 21) GDB and ATS lined up by the exterior building north wall	<ul style="list-style-type: none"> Proposed location will require minimum grading or sitework 	<ul style="list-style-type: none"> Equipment may block some of the first-floor office's window.
8.2.2* (page 21) GDB and ATS standing face to face by the exterior building north wall	<ul style="list-style-type: none"> Proposed location will require minimum grading or sitework Block minimum offices' window 	<ul style="list-style-type: none"> Equipment may block some of the first-floor office's window.

*Indicates the recommended option

9.1.1. Generator Recommendation

Option 8.1.1 and Option 8.1.2 are both feasible alternatives without any significant environmental impacts. Option 8.1.1 is recommended because of the advantages mentioned above.

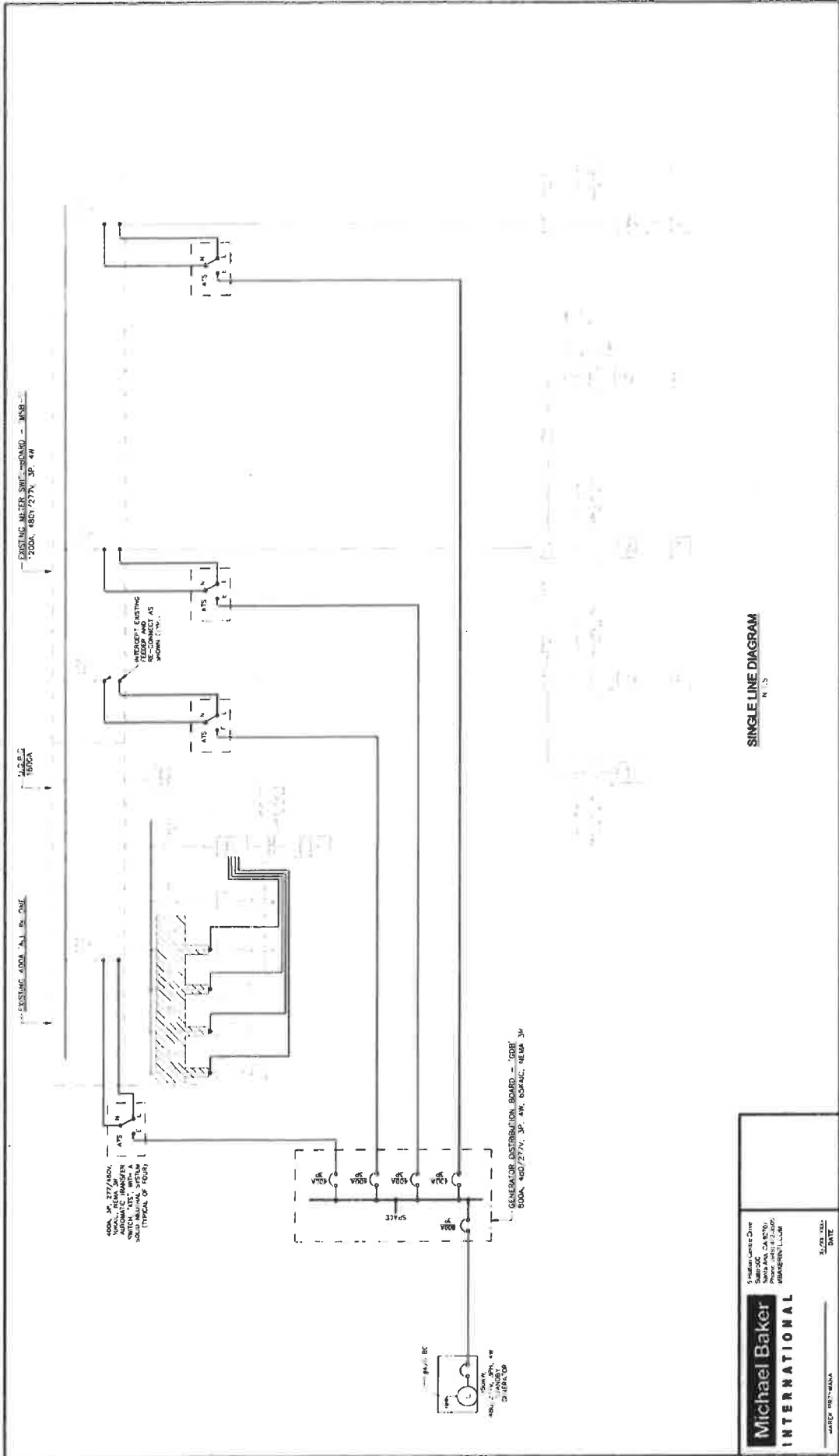


9.1.2. GDB and ATS Recommendation

Option 8.2.2 is recommended because it will block less first floor offices' windows and keeping the equipment (GDB and ATS) as close to the existing switchboard in electrical room as possible.

10.0 CONSTRUCTION PHASING PLAN

The City has been awarded with the grant to purchase emergency generator equipment, GDB and ATS. The funds are available to the City till the end of 2022. Therefore, the standard construction phasing and sequencing needs to be adjusted to accommodate the availability of the funds and the project schedule. The specification and cut sheets for the generator are provided in the PDR, so the City can expedite purchasing of the generator and associated equipment before the final plans, specifications and estimates (PS&E) are completed. This will result in successful implementation of this project. Our goal is to work proactively and avoid costly delays or complications.



SINGLE LINE DIAGRAM
N.T.S.

Michael Baker INTERNATIONAL 5 Milliken Lane Drive San Jose, CA 95128 Phone: (415) 753-2000 Fax: (415) 753-2001		DATE: _____ SCALE: _____
DESIGNED BY: _____ CHECKED BY: _____ DRAWN BY: _____ APPROVED BY: _____	DATE: _____ SCALE: _____	DATE: _____ SCALE: _____
REVISIONS 1. BY: _____ DATE: _____ 2. BY: _____ DATE: _____	REFERENCES	APPROVALS

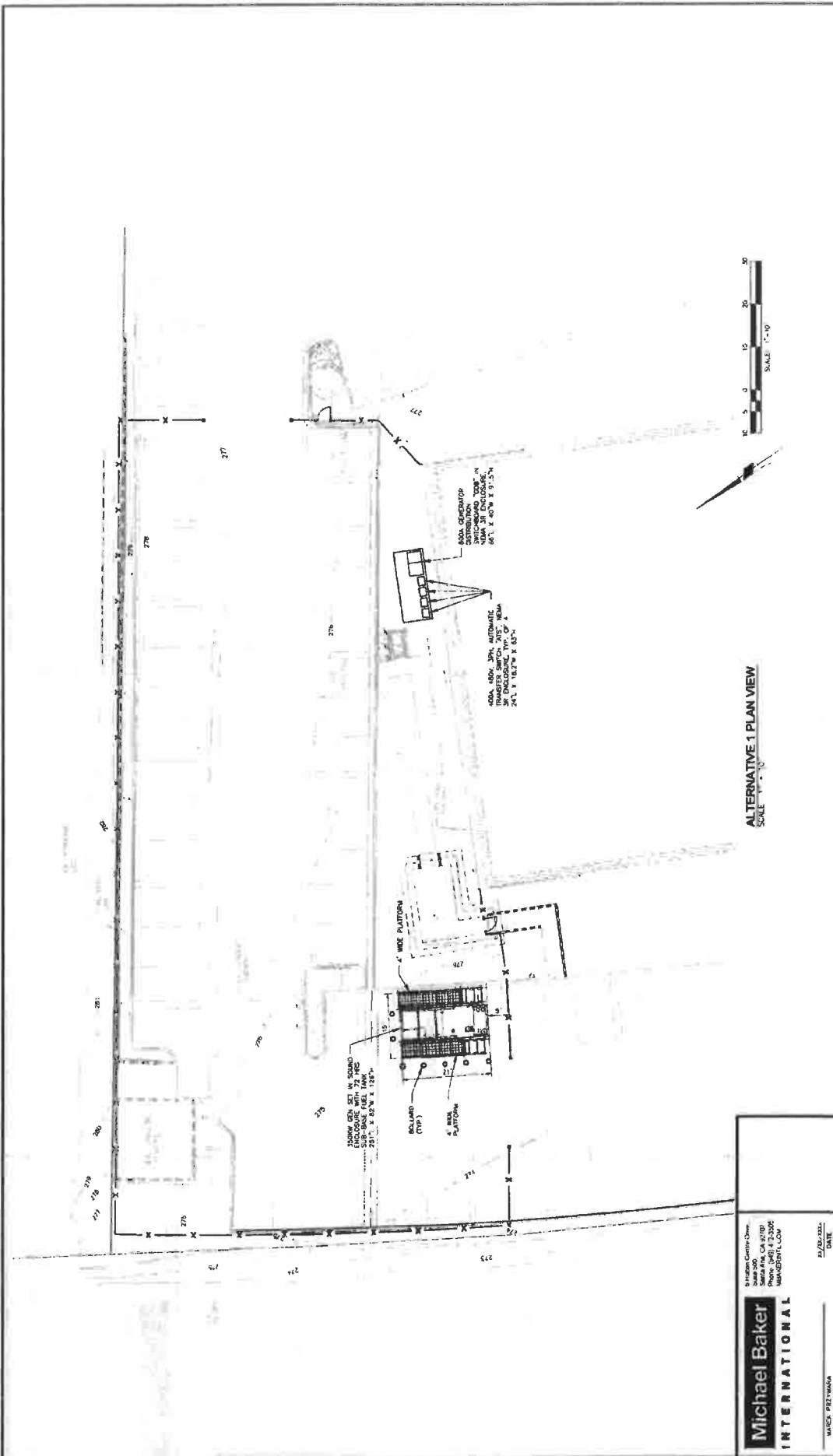
SINGLE LINE DIAGRAM
STANDBY GENERATOR ADDITION AND ELECTRICAL
DISTRIBUTION SYSTEM UPGRADE
CITY OF SAN CLEMENTE



DATE: _____
 DRAWN BY: _____
 CHECKED BY: _____
 APPROVED BY: _____
 PUBLIC WORKS DIRECTOR

EXPLANATION SCALE: _____
 AS SHOWN: _____
 UPDATED BY: _____

DRAWING NO.: _____
 SHEET: _____
 EXHIBIT-1
 OF _____



ALTERNATIVE 1 PLAN VIEW
SCALE 1" = 10'

Michael Baker INTERNATIONAL
 3000 Central Expressway
 Santa Ana, CA 92705
 (714) 261-1000
 WWW.MBI.COM

DATE: _____
 BY: JAP/PC

REV	DATE	DESCRIPTION

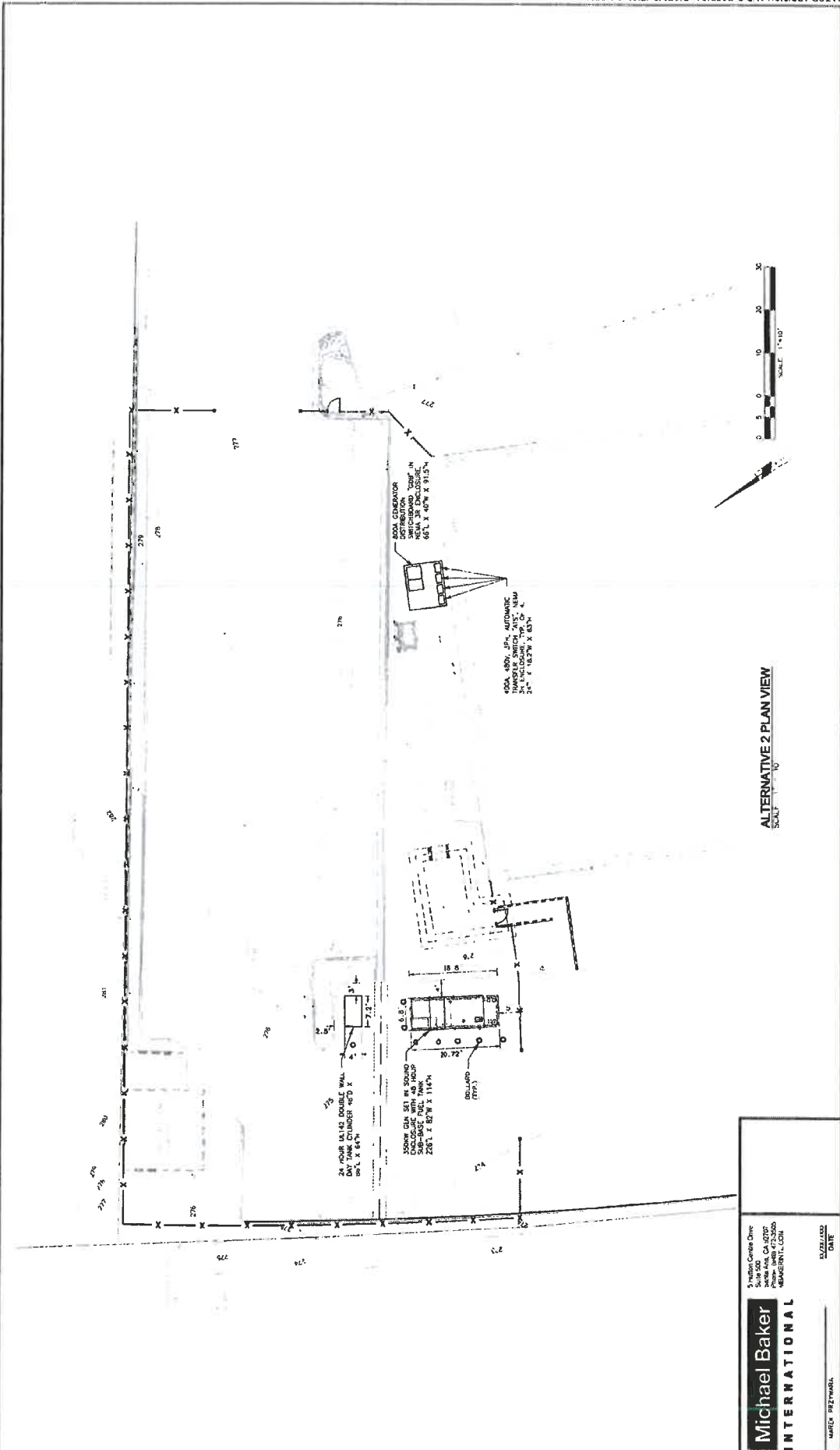
REFERENCES

APPROVALS

ENGINEERING SCALE	AS SHOWN	DATE
DRAWN BY	DESIGNED BY	
CHECKED BY	APPROVED	
	PUBLIC WORKS DIRECTOR	

STANDBY GENERATOR ADDITION AND ELECTRICAL DISTRIBUTION SYSTEM UPGRADE
 CITY OF SAN CLEMENTE

PROJECT NO.	
SHEET	EXHIBIT-J
OF	XX



Michael Baker INTERNATIONAL
 3700 Creekside Drive
 Suite 500
 Irvine, CA 92614
 PH: 949.440.2500
 MB@MBAINTL.COM

APPROVED: _____
 DATE: _____

REV.	DATE	DESCRIPTION	APPROVED	DATE
01				

REVISIONS	REFERENCES	APPROVALS

APPROVED	CHECKED BY	DESIGNED BY	DATE

ENGINEERING SCALE	AS SHOWN	DATE

CITY OF SAN CLEMENTE	STANDBY GENERATOR ADDITION AND ELECTRICAL DISTRIBUTION SYSTEM UPGRADE	DRAWING NO.
		EXHIBIT-4
		XX



City of San Clemente Public Works
Standby Generator Addition and Electrical Distribution System Upgrade
Preliminary Design Report

July 2022

APPENDIX A
ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

PROJECT TITLE		DATE PREPARED		SHEET		OF		
City of San Clemente Stationary Standby Generator for the City Hall Building ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST		7/11/2022		1		2		
COST ESTIMATE								
ESTIMATED BY								
NH								
STATUS OF DESIGN								
PDR Alternative 1								
JOB NUMBER								
188310								
ITEM DESCRIPTION	QUANTITY		MATERIAL COSTS		LABOR COSTS		ENGINEER ESTIMATE	
	NUMBER	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL
General								
Mobilization and Demobilization	1	LS	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
Demo Existing Pavement and Misc.	1	LS	\$ -	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000
Tree, Brushes Removal	1	LS	\$ -	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000
Civil								
Subgrade	1	LS	\$ 600	\$ 600	\$ 1,200	\$ 1,200	\$ 1,800	\$ 1,800
Concrete Slab (generator)	22	CY	\$ 200	\$ 4,400	\$ 300	\$ 6,600	\$ 500	\$ 11,000
AC Pavement	1	LS	\$ 3,600	\$ 3,600	\$ 5,400	\$ 5,400	\$ 9,000	\$ 9,000
Stairs and Platforms	1	LS	\$ 7,200	\$ 7,200	\$ 9,000	\$ 9,000	\$ 16,200	\$ 16,200
Removable Guard Post	7	EA	\$ 600	\$ 4,200	\$ 360	\$ 2,520	\$ 960	\$ 6,720
Excavation and Disposal	40	CY	\$ 30	\$ 1,200	\$ 150	\$ 6,000	\$ 180	\$ 7,200
Electrical								
350kW Generator w/Sound Enclosure, 72-hour of Sub-base Fuel Tank with Platform	1	LS	\$ 310,000	\$ 310,000	\$ 120,000	\$ 120,000	\$ 430,000	\$ 430,000
800A NEMA 3R Generator Distribution Switchboard with 800A Main and Four 400A Feeder Breaker	1	LS	\$ 180,000	\$ 180,000	\$ 60,000	\$ 60,000	\$ 240,000	\$ 240,000
400A NEMA3R ATS	4	EA	\$ 30,000	\$ 120,000	\$ 10,000	\$ 40,000	\$ 40,000	\$ 160,000
Conduits and Wiring	1	LS	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	\$ 80,000	\$ 80,000
Ground Rod System	1	LS	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 10,000	\$ 10,000
Modification of Existing Electrical Gear	1	LS	\$ 5,000	\$ 5,000	\$ 25,000	\$ 25,000	\$ 30,000	\$ 30,000
Subtotal								\$ 1,063,920
20% Contingency								\$ 212,790
Total								\$ 1,277,000

PROJECT TITLE
City of San Clemente
Stationary Standby Generator for the City Hall Building
ENGINEER'S ESTIMATE OF PROBABLE CONSTRUCTION COST

COST ESTIMATE

DATE PREPARED: 7/1/2022
 SHEET: 2 OF 2

ESTIMATED BY: NH
 STATUS OF DESIGN: PDR
 JOB NUMBER: 188310
 Alternative 2

ITEM DESCRIPTION	QUANTITY		MATERIAL COSTS		LABOR COSTS		ENGINEER ESTIMATE	
	NUMBER	UNIT	UNIT COST	TOTAL	UNIT COST	TOTAL	UNIT COST	TOTAL
General								
Mobilization and Demobilization	1	LS		\$ 50,000		\$ 50,000	\$ 50,000	\$ 50,000
Demo Existing Pavement and Misc.	1	LS		\$ 8,000		\$ 8,000	\$ 8,000	\$ 8,000
Tree Brush Removal	1	LS		\$ -	\$ 7,500	\$ 7,500	\$ 7,500	\$ 7,500
Civil								
Subgrade	1	LS	\$ 600	\$ 600	\$ 1,200	\$ 1,200	\$ 1,800	\$ 1,800
Concrete Slab (generator + day tank)	26	CY	\$ 200	\$ 5,200	\$ 300	\$ 7,800	\$ 500	\$ 13,000
AC Pavement	1	LS	\$ 4,200	\$ 4,200	\$ 6,500	\$ 6,500	\$ 10,700	\$ 10,700
Removable Guard Post	8	EA	\$ 600	\$ 4,800	\$ 360	\$ 2,880	\$ 960	\$ 7,680
Excavation and Disposal	50	CY	\$ 30	\$ 1,500	\$ 150	\$ 7,500	\$ 180	\$ 9,000
Electrical								
350KW Generator w/Sound Enclosure 48-hour of Sub-base Fuel Tank	1	LS	\$ 240,000	\$ 240,000	\$ 120,000	\$ 120,000	\$ 360,000	\$ 360,000
600-Gallon UL 142 Day Tank with Pump and Accessories	1	LS	\$ 30,000	\$ 30,000	\$ 25,000	\$ 25,000	\$ 55,000	\$ 55,000
800A NEMA 3R Generator Distribution Switchboard with 800A Main and Four 400A Feeder Breakers	1	LS	\$ 180,000	\$ 180,000	\$ 60,000	\$ 60,000	\$ 240,000	\$ 240,000
400A NEMA3R ATS	4	EA	\$ 30,000	\$ 120,000	\$ 10,000	\$ 40,000	\$ 40,000	\$ 160,000
Conduits and Wiring	1	LS	\$ 45,000	\$ 45,000	\$ 50,000	\$ 50,000	\$ 95,000	\$ 95,000
Ground Rod System	1	LS	\$ 5,000	\$ 5,000	\$ 5,000	\$ 5,000	\$ 10,000	\$ 10,000
Modification of Existing Electrical Gear	1	LS	\$ 5,000	\$ 5,000	\$ 25,000	\$ 25,000	\$ 30,000	\$ 30,000
Subtotal								\$ 1,057,680
20% Contingency								\$ 211,540
Total	1	LS						\$ 1,270,000



APPENDIX B

MANUFACTURER CUT SHEETS FOR MAJOR EQUIPMENT

Equipment List:

- Item #1 – 350kW Generator
- Item #2 – Generator Sound Enclosure
- Item #3 – Generator Sub-Base Fuel Tank
- Item #4 – Generator Control Panel
- Item #5 – Generator Remote Annunciator Panel
- Item #6 – Standalone Day Tank
- Item #7 – Generator Distribution Switchboard "GDB"
- Item #8 – Automatic Transfer Switch "ATS"



Image shown may not reflect actual configuration

350 ekW – 400 ekW

60 Hz

Standby	Prime
350 kVA	320 kVA
400 kVA	365 kVA

BENEFITS & FEATURES

CAT® GENERATOR SET PACKAGE

Cat generator set packages have been fully prototype tested and certified torsional vibration analysis reports are available. The packages are designed to meet the NFPA 110 requirement for loading, conform to the ISO 8528-5 steady state and full transient response requirements.

CAT DIESEL ENGINES

The four-cycle Cat diesel engine combines consistent performance with excellent fuel economy and transient response that meets or exceeds ISO 8528-5. The engines feature a reliable, rugged, and durable design that has been field proven in thousands of applications worldwide in emergency standby installations.

COOLING SYSTEM

The cooling system has been designed and tested to ensure proper generator set cooling, and includes the radiator, fan, belts, and all guarding installed as standard. Contact your Cat dealer for specific ambient and altitude capabilities.

GENERATORS

The generators used on Cat packages have been designed and tested to work with the Cat engine. The generators are built with robust Class H insulation and provide industry-leading motor starting capability and altitude capabilities.

EMCP CONTROL PANELS

The EMCP controller features the reliability and durability you have to come to expect from your Cat equipment. The EMCP 4 is a scalable control platform designed to ensure reliable generator set operation, providing extensive information about power output and engine operation. EMCP 4 systems can be further customized to meet your needs through programming and expansion modules.

SPECIFICATIONS

ENGINE SPECIFICATIONS

Engine Model	Cat® C13 ACERT In-line 6, 4-cycle diesel
Bore x Stroke	130mm x 157mm (5.1 in x 6.2 in)
Displacement	12.5 L (763 in ³)
Compression Ratio	16.3:1
Aspiration	Turbocharged Air-to-Air Aftercooled
Fuel Injection System	MEUI
Governor	Electronic ADEM™ A4
Emission Certifications	EPA TIER III

GENERATOR SET SPECIFICATIONS

Alternator Design	Brushless Single Bearing, 4 Pole
Stator	2/3 Pitch
No. of Leads	12
Available Voltage Options	600V/480V/440V/240V/220V
Frequency	60Hz
Alternator Voltage	24V
Alternator Insulation & IP	Class H; IP23
Standard Temperature Rise	125/130 Deg C
Available Excitation Options	Self-Excited, PMG
Voltage Regulation, Steady State+/-	≤1%

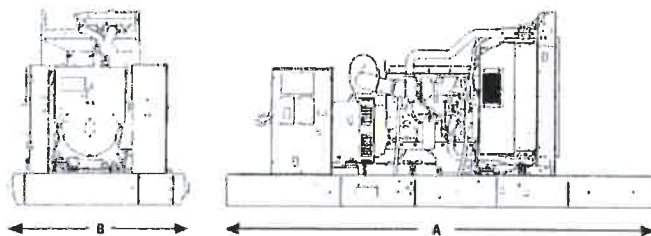
STANDARD EQUIPMENT

Air inlet system	Aftercooler core Turbocharger
Control panels	EMCP4.2 control panel
Cooling system	Coolant drain line with valve; terminated on edge of base Fan and belt guards Coolant Level Sensor Thermostats and housing, full open temperature 92 deg C (198 deg F) Coolant level sight gauge Jacket water pump, gear driven, centrifugal Caterpillar Extended Life Coolant
Exhaust system	Exhaust manifold, dry
Telematics	PL444 4G LTE
Fuel system	Primary fuel filter w/integral water separator & secondary filter Fuel cooler Fuel priming pump Flexible fuel lines Engine fuel transfer pump
Generators and generator attachments	Brushless, self-excited 2/3 pitch, random wound IP23 Protection Insulation Class H and temperature rise Power centre, IP22 bottom cable entry Segregated low voltage wiring pane
Governing system	Cat Electronic Governor (ADEM A4)
Protection System	Safety Shutoff – High Water Temperature Safety Shutoff – Low Oil Pressure Safety Shutoff – Overspeed Coolant Level Sensor
Base/Fuel Tank	Narrow Skid Wide/Standard Sub Tank Base – UL & ULC Listed Integral Tank Base – UL & ULC Listed Spill Containment Overfill Prevention Valve
Starting/charging system	24-Volt Electric Starting Motor Charging Alternator
Certifications	EPA Stationary Emergency Use

OPTIONAL EQUIPMENT

Air inlet system	Single/Dual Element Air Cleaner Heavy Duty Air Cleaner
Control panels	EMCP 4.4 Local Annunciator Remote Annunciators Discrete I/O Module Device Server Volt Free Contact Earth (Ground) Fault Relay
Circuit Breakers	3-Pole 100% Rated – Single (Manual & Motorized) 3-Pole 100% Rated – Dual & Third (Manual) External Paralleling Auxiliary Contacts Neutral Bar
Enclosures	Sound Attenuated (SA) Weather Protective
Cooling system	Stone guards
Telematics	PLG601, PLG641
Mufflers	Industrial grade (10 dBA) Residential and Critical grade (25 dBA)
Base/Fuel Tank	Audio & Visual Fuel Alarm
Fuel System	Integral 670 Gal Tank Base Sub Tank Bases: 660, 1000, 1900, 2200 Gal
Generators and generator attachments	Excitation – Self Excitation – Internal/AREP/PMG Oversize Coastal Protection (CIP) Space Heater Control
Starting/charging system	Standard Battery Set Oversize Battery Set
Certifications	UL2200 Listed CSA 22.2 Certification of Compliance – IBC Seismic Certification of Compliance – IBC Seismic and HCAI
General	Tool Set

WEIGHTS & DIMENSIONS



Note: General configuration not to be used for installation.
See general dimension drawings for detail.

Standby Ratings	Dim "A" mm (in)	Dim "B" mm (in)	Dim "C" mm (in)	Generator Set Weight kg (lb)
350 kW	3505 (138)	1652 (65)	2069 (82)	3696 (8147)
400 kW	3505 (138)	1652 (65)	2069 (82)	3823 (8427)



Image shown may not reflect actual configuration

C13/C15/C18 Sound Attenuated Enclosures

U.S. Sourced
Diesel Generator Set
350-600 kW 60 Hz

Features

Robust/Highly Corrosion Resistant Construction

- Factory installed on skid base
- Environmentally friendly, polyester powder baked paint
- 14 gauge steel
- Interior zinc plated fasteners
- Exterior stainless steel fasteners
- Internally mounted exhaust silencing system
- Designed and tested to comply with UL 2200 Listed generator set package
- Compression door latches providing solid door seal

Excellent Access

- Large cable entry area for installation ease
- Accommodates side mounted single or multiple breakers
- Three doors on both sides
- Vertically hinged allow 180° opening rotation and retention with door stays
- Lube oil and coolant drains piped to the exterior of the enclosure base
- Radiator fill cover

Security and Safety

- Lockable access doors which give full access to control panel and breaker
- Cooling fan and battery charging alternator fully guarded
- Fuel fill, oil fill, and battery can only be reached via lockable access
- Externally mounted emergency stop button
- Designed for spreader bar lifting to ensure safety
- Stub-up area is rodent proof

Transportability

These enclosures are of extremely rugged construction to withstand outdoor exposure and rough handling common on many construction sites.

Options

- Enclosure constructed with 14 gauge steel
- Enclosure constructed with 12 gauge aluminum (5052 grade)
- Caterpillar Yellow* or white paint
- Control panel viewing window
- UL Listed integral fuel tank with 680, 400, and 300 gallon capacities
- UL Listed sub-base fuel tank with 660, 1000, 1900, and 2200 gallon capacities.
- Seismic certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010
- IBC Certification for 150 mph wind loading
- AC/DC lighting package
- 5 kW canopy space heater to facilitate compliance with NFPA 110
- Motorized louvers and gravity discharge damper
- 125A load center
- GFCI outlets

*Not available with aluminum enclosures.



Level 1 Sound Attenuated Enclosure (Steel) Sound Levels

Model	Standby ekW	Cooling Air Flow Rate		Ambient Capability*		Sound Pressure Levels (dBA) at 7m (23 ft)
		m ³ /s	cfm	°C	°F	100% Load
C13	350	8.5	18010	57	135	74
	400	8.5	18010	56	133	75
C15	350	10.4	22072	59	138	73
	400	10.4	22072	51	124	73
	450	10.4	22072	46	115	74
	500	12.5	26415	48	118	75
C18	550	8.1	17234	45	113	75
	600	8.1	17234	43	109	75

Sound Attenuated Enclosure (Aluminum) Sound Levels

Model	Standby ekW	Cooling Air Flow Rate		Ambient Capability*		Sound Pressure Levels (dBA) at 7m (23 ft)
		m ³ /s	cfm	°C	°F	100% Load
C13	350	8.5	18010	57	135	75
	400	8.5	18010	56	133	75
C15	350	10.4	22072	59	138	72
	400	10.4	22072	51	124	73
	450	10.4	22072	46	115	74
	500	12.5	26415	48	118	75
C18	550	8.1	17234	45	113	76
	600	8.1	17234	43	109	76

Level 2 Sound Attenuated Enclosure (Steel) Sound Levels

Model	Standby ekW	Cooling Air Flow Rate		Ambient Capability*		Sound Pressure Levels (dBA) at 7m (23 ft)
		m ³ /s	cfm	°C	°F	100% Load
C13	350	7.2	15256	50	122	70
	400	7.2	15256	50	122	70

*Cooling system performance at sea level. Consult your Cat® dealer for site specific ambient and altitude capabilities.

Note: Sound level measurements are subject to instrumentation, installation, and manufacturing variability, as well as ambient site conditions.

Item #2: Sound Enclosure

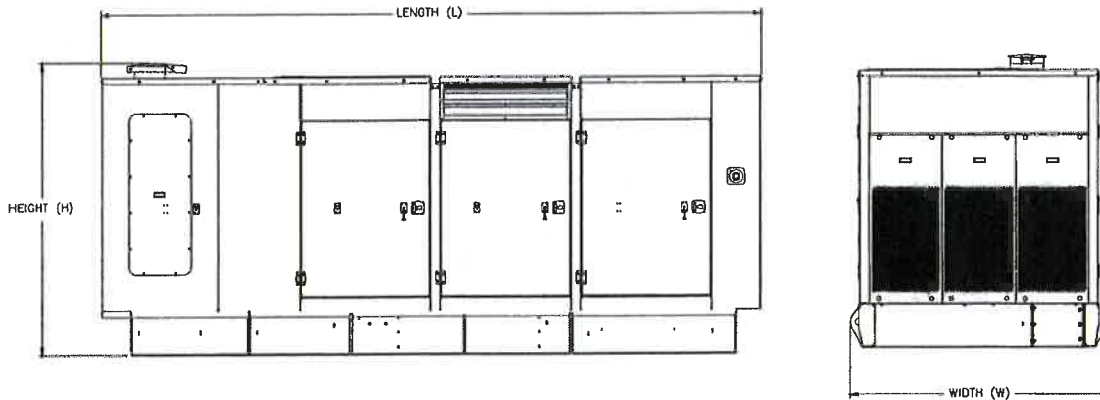
Enclosures



Component Weights to Calculate Package Weight

Model	Standby ekW	Narrow Skid Base		Wide Skid Base		Sound Attenuated Enclosure (Steel)		Sound Attenuated Enclosure (Aluminum)	
		kg	lb	kg	lb	kg	lb	kg	lb
C13	350	253	578	579	1276	1245	2745	765	1687
	400								
C15	350	273	602	465	1025	1245	2745	765	1687
	400								
	450								
	500								
C18	550	301	664	466	1027	1301	2868	817	1801
	600								

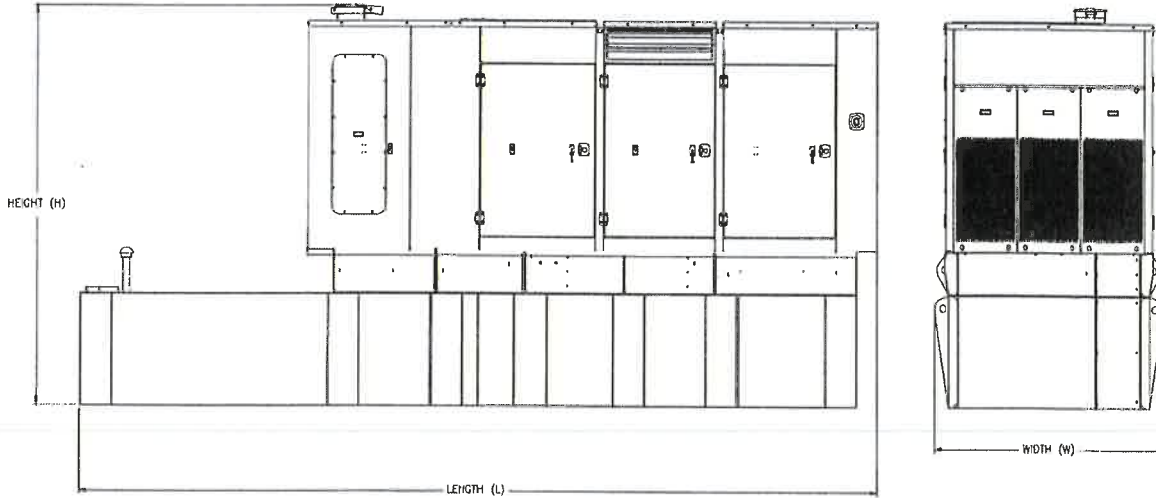
Sound Attenuated Enclosure on Skid Base



Model	Standby ekW	Length "L"		Width "W"		Height "H"	
		mm	in	mm	in	mm	in
C13	350	4948	194.8	2014	79.3	2320	91.3
	400						
C15	350	4948	194.8	2014	79.3	2320	91.3
	400						
	450						
	500						
C18	550	5183	204.0	2014	79.3	2262	89.0
	600						



Sound Attenuated Enclosure on a UL Listed 1900 and 2200 Gallon Sub-Base Fuel Tank Base



Model	Standby ekW	Length "L"		Width "W"		Height "H"	
		mm	in	mm	in	mm	in
C13	350	6382	251.2	2056	80.9	3209	126.3
	400						
C15	350	6382	251.2	2056	80.9	3209	126.3
	400						
	450						
	500						
C18	550	7271	286.2	2056	80.9	3151	124.1
	600						

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C13 / C15 / C18 Integral and Sub-Base Fuel Tanks

US Sourced
Diesel Generator Set
350 – 750 ekW 60 Hz

Picture shown may not represent actual package.

Features

- UL Listed for United States (UL 142) and Canada (CAN/ULC S601)
- Facilitates compliance with NFPA 30 code, NFPA 37 and 110 standards and CSA C282 code
- Dual wall
- Lockable fuel fill cap, 4" (101.6 mm) NPT
- Low fuel level warning standard, customer configurable warning or shutdown
- Primary tank leak detection switch in containment basin
- Tank design provides capacity for thermal expansion of fuel
- Fuel supply dip tube is positioned so as not to pick up fuel sediment
- Fuel return and supply dip tube is separated by an internal baffle to prevent immediate re-supply of heated return fuel
- Pressure washed with an iron phosphate solution
- Interior tank surfaces coated with a solvent-based thin-film rust preventative
- Heavy gauge steel gussets with internal lifting rings
- Primary and secondary tanks are leak tested at 20.7 kPa (3 psi) minimum
- Compatible with open packages and enclosures
- Gloss black polyester alkyd enamel exterior paint
- Welded steel containment basin (minimum of 110% of primary tank capacity)
- Direct reading fuel gauge with variable electrical output
- Emergency vents on primary and secondary tanks are sized in accordance with NFPA 30

Sub-Base

- The Sub-Base fuel tank mounts below the generator set wide base

Integral

- Integral diesel fuel tank is incorporated into the generator set base frame
- Robust base design includes linear vibration isolators between tank base and engine generator

Options

- Audio/visual fuel level alarm panel
- 5 gal (18.9 L) spill containment
- 5 gal (18.9 L) spill containment with fuel fill drop tube with in 6" (152 mm) from bottom of tank
- 5 gal (18.9 L) spill containment with overfill prevention valve and fuel fill drop tube with in 6" (152 mm) from bottom of tank
- ULC Listed 7.5 gal (28.4 L) spill containment with vent extensions, vent whistle, and drop tube facilitating compliance with CSA B139-09
- ULC Listed 7.5 gal (28.4 L) spill containment with overfill prevention valve, vent extensions, vent whistle and drop tube facilitating compliance with CSA B139-09



Integral & Sub-Base Fuel Tank Base Useable Capacities with Fuel Tank Dimensions & Weights

Integral – Width (W) 2014 mm (79.3 in)

Sub-base – Width (W) 2056 mm (81.0 in)

Integral* – Width(W) 2315 mm (91.2 in)

Sub-base* – Width(W) 2357 mm (92.7in)

C13 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank			
		Liter	Gallon	Liter	Gallon	Dry Weight		Height 'H'		Length 'L'		Open		Enclosure	
						kg	lb	mm	in	mm	in	mm	in	mm	in
Integral	FTDW013	2646	699	2540	671	1569	3450	762	30.0	5461	215	2552	100.5	2743	108.0
Sub-Base	FTDW005 / FTDW016	3941	1041	3876	1024	1659	3657	635	25.0	5550	218.5	2763	108.8	2955	116.3
Sub-Base	FTDW006	6980	1844	6818	1801	2228	4483	889	35.0	6184	243.5	3017	118.8	3209	126.3
Sub-Base	FTDW007	8339	2203	8244	2178	2150	5052	889	35.0	7074	278.5	2291	117.8	3789	149.2
Sub-Base	FTDW011	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	2763	108.8	2955	116.3

C15 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank			
		Liter	Gallon	Liter	Gallon	Dry Weight		Height 'H'		Length 'L'		Open		Enclosure	
						kg	lb	mm	in	mm	in	mm	in	mm	in
Integral	FTDW002	1283	339	1262	333	1015	2237	635	25.0	3814	150.1	2426	95.5	2619	103.0
Sub-Base	FTDW005 / FTDW016	3941	1041	3876	1024	1659	3657	635	25.0	5550	218.5	2763	108.8	2955	116.3
Sub-Base	FTDW006	6980	1844	6818	1801	2228	4912	889	35.0	6184	243.5	3017	118.8	3209	126.3
Sub-Base	FTDW008	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	2763	108.8	2955	116.3
Sub-Base	FTDW034	10887	2876	9899	2615	2847	6277	914	36	7747	305	3043	119.8	3233	127.3

C18 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank			
		Liter	Gallon	Liter	Gallon	Dry Weight		Height 'H'		Length 'L'		Open		Enclosure	
						kg	lb	mm	in	mm	in	mm	in	mm	in
Integral	FTDW004	1446	382	1422	376	1015	2237	635	25.0	3814	150.1	2426	95.5	2560	100.8
Integral*	FTDW030	2498	660	2381	629	1681	3703	762	30.0	4995	196.6	2670	105.1	2675	105.3
Integral*	FTDW031	5175	1367	4997	1320	2046	4510	762	30.0	6737	265.3	2670	105.1	2675	105.3
Sub-Base	FTDW005 / FTDW016	3941	1041	3876	1024	1659	3657	635	25.0	5550	218.5	2763	108.8	2955	116.3
Sub-Base	FTDW007	8339	2203	8244	2178	2150	4134	889	35.0	7074	278.5	2291	117.8	3159	124.4
Sub-Base	FTDW008	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	2739	107.9	2905	114.4
Sub-Base*	FTDW032	10228	2702	10112	2640	2638	5816	889	35.0	7368	290	3127	123.1	3132	123.3

*For Ratings 650, 700 & 750 kW only

Item #3: Sub-Base Fuel Tank

ATTACHMENTS



Integral & Sub-Base Fuel Tank Base Useable Capacities with Fuel Tank Dimensions & Weights

Integral - Width(W) 2014 mm (79.3 in)
 Sub-base - Width(W) 2056 mm (81 in)
 Integral* - Width(W) 2315 mm (91.2 in)
 Sub-base*-Width(W) 2357 mm (92.7in)

Sound Attenuated Enclosure

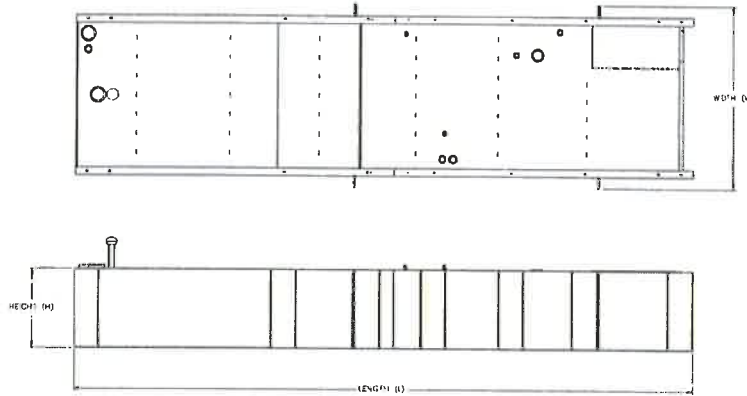
C13 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank			
						Dry Weight		Height 'H'		Length 'L'		Open		Enclosure	
		Liter	Gallon	Liter	Gallon	kg	lb	mm	in	mm	in	mm	in	mm	in
Integral	FTDW013	2646	699	2540	671	1569	3450	762	30.0	5461	215.0	NA	NA	2743	108.0
Sub-Base	FTDW005 / FTDW016	3941	1041	3876	1024	1659	3657	635	25.0	5550	218.5	NA	NA	2955	116.3
Sub-Base	FTDW006	6980	1844	6818	1801	2033	4483	889	35.0	6184	243.5	NA	NA	3209	126.3
Sub-Base	FTDW007	8339	2203	8244	2178	2292	5052	889	35.0	7074	278.5	NA	NA	3209	126.3
Sub-Base	FTDW011	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	NA	NA	2955	116.3

C15 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank			
						Dry Weight		Height 'H'		Length 'L'		Open		Enclosure	
		Liter	Gallon	Liter	Gallon	kg	lb	mm	in	mm	in	mm	in	mm	in
Integral	FTDW001	1283	339	1262	333	1015	2237	639	25.0	4746	186.9	NA	NA	2619	103.0
Sub-Base	FTDW005 / FTDW016	3941	1041	3876	1024	1659	3657	635	25.0	5550	218.5	NA	NA	2955	116.3
Sub-Base	FTDW006	6980	1844	6818	1801	2228	4912	889	35.0	6184	243.5	NA	NA	3209	126.3
Sub-Base	FTDW011	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	NA	NA	2955	116.3
Sub-Base	FTDW034	10887	2876	9899	2615	2847	6277	914	36	7747	305	NA	NA	3233	127.3

C18 Tank Design	Feature Code	Total Capacity		Useable Capacity		Tank Only						Overall Package Height with Tank			
						Dry Weight		Height 'H'		Length 'L'		Open		Enclosure	
		Liter	Gallon	Liter	Gallon	kg	lb	mm	in	mm	in	mm	in	mm	in
Integral	FTDW003	1446	382	1422	376	1015	2237	635	25.0	3814	150.1	NA	NA	2560	100.8
Integral*	FTDW030	2498	660	2381	629	1681	3703	762	30.0	4995	196.6	2670	105	2675	105.3
Integral*	FTDW031	5175	1367	4997	1320	2046	4510	762	30.0	6737	265.3	NA	NA	2675	105.3
Sub-Base	FTDW005 / FTDW016	3941	1041	3876	1024	1659	3657	635	25.0	5550	218.5	NA	NA	2905	114.3
Sub-Base	FTDW007	8339	2203	8244	2178	2150	4134	889	35.0	7074	278.5	NA	NA	3209	126.3
Sub-Base	FTDW011	2476	654	2435	643	1468	3236	635	25.0	3810	150.0	NA	NA	2905	114.3
Sub-Base*	FTDW032	10228	2702	9994	2640	2638	5816	889	35.0	7368	290	NA	NA	3132	123.3

*For Ratings 650, 700 & 750 kW only

Item #3: Sub-Base Fuel Tank



The heights listed above do not include lumber used during manufacturing and shipping.

Estimated Run Times (Hours) at 100% Load

C13 Tank Design	Feature Code	Standby Ratings (ekW)				Prime Ratings (ekW)			
		400	350	-	-	350	320	-	-
Integral Tank	FTDW013	24	27	-	-	25	29	-	-
Sub-Base	FTDW005 / FTDW016	36	41	-	-	38	43	-	-
Sub-Base	FTDW006	65	72	-	-	72	77	-	-
Sub-Base	FTDW007	77	87	-	-	81	93	-	-
Sub-Base	FTDW011	23	25	-	-	24	27	-	-

C15 Tank Design	Feature Code	Standby Ratings (ekW)				Prime Ratings (ekW)			
		500	450	400	350	455	410	365	320
Integral Tank	FTDW001 / FTDW002	9	9	11	11	10	10	11	12
Sub-Base	FTDW005 / FTDW016	28	29	32	36	30	31	35	38
Sub-Base	FTDW006	50	52	57	63	54	56	62	67
Sub-Base	FTDW008 / FTDW011	17	18	20	22	19	20	22	24
Sub-Base	FTDW034	72	75	82	91	78	81	90	97

C18 Tank Design	Feature Code	Standby Ratings (ekW)					Prime Ratings (ekW)				
		750	700	650	600	550	680	635	600	545	500
Integral	FTDW003 / FTDW004	-	-	-	8	9	-	-	-	9	10
Integral*	FTDW030	11	12	13	-	-	12	13	14	-	-
Integral*	FTDW031	24	25	27	-	-	26	27	29	33	36
Sub-Base	FTDW005 / FTDW016	-	-	-	24	25	-	-	-	25	27
Sub-Base	FTDW007	-	-	-	51	54	-	-	-	54	59
Sub-Base	FTDW008 / FTDW011	-	-	-	15	16	-	-	-	16	17
Sub-Base*	FTDW032	49	51	54	-	-	53	55	58	-	-

*For Ratings 650, 700 & 750 ekW only



Tanks with full electrical stub-up area include removable end channel. Tanks with RH stub-up include stub-up area directly below the circuit breaker or power terminal strips. Dimensions include weather-protective enclosure exhaust system.

Dual wall sub-base tanks are UL Listed and constructed in accordance with UL Standard for Safety UL 142, Steel Aboveground Tanks for Flammable and Combustible Liquids and Canada CAN/ULC S601, Standard for Shop Fabricated Steel Aboveground Horizontal Tanks for Flammable and Combustible Liquids.

Fuel tanks and applicable options facilitate compliance with the following United States NFPA Code and Standards:

NFPA 30: Flammable and Combustible Liquids Code
NFPA 37: Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
NFPA 110: Standard for Emergency and Standby Power Systems

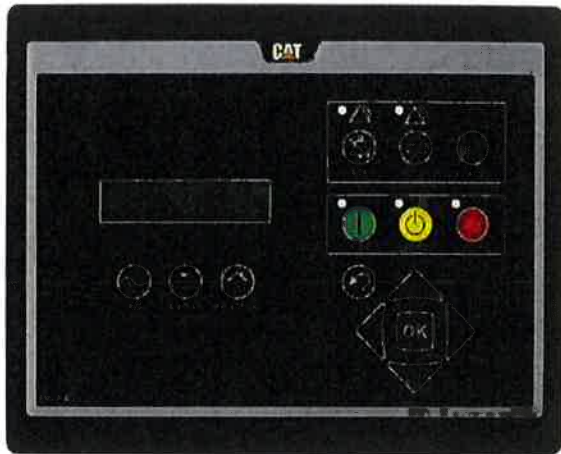
Fuel tanks and applicable options facilitate compliance with the following Canadian Standard and Code:
CSA C282 – Emergency Electrical Power Supply for Buildings
CSA B139-09 - Installation Code for Oil-Burning Equipment

The following sub-base fuel tanks meet Chicago code for containment and labelling:

FTDW005
FTDW008
FTDW011

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The International System of Units (SI) is used in this publication.
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Picture shown may not reflect actual configuration

Full range of attachments

- Wide range of system expansion attachments, designed specifically to work with the EMCP 4
- Flexible packaging options for easy and cost effective installation

World wide product support

- Cat dealers provide extensive pre and post sale support
- Cat dealers have over 1,600 dealer branch stores operating in 200 countries

Features

- A 33 x 132 pixel, 3.8 inch, white backlit graphical display denotes text alarm/event descriptions, set points, engine and generator monitoring, and is visible in all lighting conditions.
- Textual display with support for 26 languages
- Advanced engine monitoring is available on systems with an ADEM™ controller.
- Integration with the CDVR and IVR provides enhanced system performance
- Fully featured power metering, protective relaying, engine and generator parameter viewing, and expanded AC metering are all integrated into this controller.
- Real-time clock allows for date and time stamping of diagnostics and events in the control's logs as well as service maintenance reminders based on engine operating hours or calendar days. Up to 40 diagnostic events are stored in the non-volatile memory

EMCP 4.2B GENERATOR SET CONTROLLER

The Cat® EMCP 4.2B offers fully featured power metering, protective relaying and engine and generator control and monitoring. Engine and generator controls, diagnostics, and operating information are accessible via the control panel keypads; diagnostics from the EMCP 4 optional modules can be viewed and reset through the EMCP 4.2B.

Features

- Ability to view and reset diagnostics on EMCP 4 optional modules via the control panel removes the need for a separate service tool for troubleshooting
- Set points and software stored in non-volatile memory, preventing loss during a power outage
- Five levels of security allow for configurable operator privileges
- Programmable security levels for groups of setpoints.
- Programmable kW Relays (3)
- Programmable weekly exerciser timer
- Dealer configurable resistive maps
- Default overview screen
- Real (kW) Load histogram
- Auto mains failure
- Programmable logic functionality
- Selectable units
 - Temperature: °C or °F
 - Pressure: psi, kPa, bar
 - Fuel Consumption: Liter/hr or Gal/hr (U.S. or U.K.)



Standard Features

- Voltage (L-L, L-N)
- Current (Phase)
- Average Volt, Amp, Frequency
- kW, kVAR, kVA (Average, Phase, %)
- Power Factor (Average, Phase)
- kW-hr, kVAR-hr (total)
- Excitation voltage and current (with CDVR)
- Desired Voltage, Excitation Command, Operating Mode (with IVR)
- Generator stator and bearing temp (with optional module)
- kW load histogram

Generator Protection

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under frequency (81 O/U)
- Reverse Power (kW) (32)
- Reverse Reactive Power (kVAR) (32RV)
- Overcurrent (50/51)
- Thermal Damage Curve

Engine Monitoring

- Coolant temperature
- Oil pressure
- Engine speed (RPM)
- Battery voltage
- Run hours
- Crank attempt and successful start counter
- Enhanced engine monitoring (with electronic engines)

Engine Protection

- Control switch not in auto (alarm)
- High coolant temp (alarm and shutdown)
- Low coolant temp (alarm)
- Low coolant level (alarm)
- High engine oil temp (alarm and shutdown)
- Low, high, and weak battery voltage
- Overspeed
- Overcrank
- Low Oil Pressure

Control

- Run / Auto / Stop control
- Speed and voltage adjust
- Local and remote emergency stop
- Remote start/stop
- Cycle crank

Inputs & Outputs

- Two dedicated digital inputs
- Three analog inputs
- Six programmable digital inputs
- Eight relay out
- Two programmable digital outputs

Communications

- Primary and accessory CAN data links
- RS-485 annunciator data link
- Modbus RTU (RS-485 Half duplex)

Language Support

Arabic, Bulgarian, Czech, Chinese, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hungarian, Italian, Icelandic, Japanese, Latvian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Spanish, Swedish, Turkish

Environmental

- Control module operating temperature: -40°C to 70°C
- Display operating temperature: -20°C to 70°C
- Humidity: 100% condensing 30°C to 60°C
- Storage temperature: -40°C to 85°C
- Vibration: Random profile, 24-1000 Hz, 4.3G rms

Standards

- UL Recognized
- CSA C22.2 No.100,14, 94
- Complies with all necessary standards for CE Certification
 - 98/37/EC Machinery Directive
 - BS EN 60204-1 Safety of Machinery 89/336/EEC EMC Directive
 - BS EN 50081-1 Emissions Standard
 - BS EN 50082-2 Immunity Standard 73/23/EEC Low Voltage Directive
 - EN 50178 LVD Standard
- IEC529, IEC60034-5, IEC61131-3
- MIL STND 461

Optional Modules

CAN annunciator



The EMCP 4 CAN Annunciator serves to display generator set system alarm conditions and status indications.

The annunciator has been designed for use on the accessory communication network and may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of four annunciators may be used with a single EMCP.

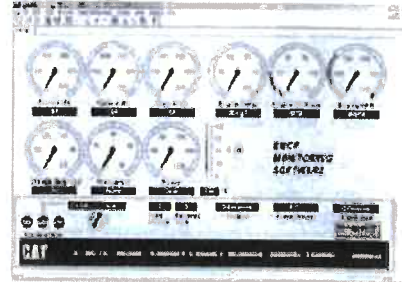
RS-485 annunciator



The EMCP 4 RS-485 Annunciator serves to display generator set system alarm conditions and status indications. The annunciator has been designed for use on the long distance annunciator datalink and is used for remote (up to 4000 feet) application.

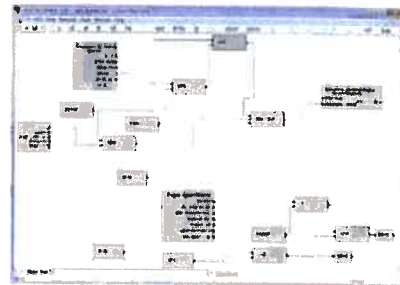
The remote monitoring software allows the user to configure data monitoring and data acquisition processes for monitoring, graphing, and logging of generator set data.

Remote monitoring software



The EMCP remote monitoring software package is a PC based program which allows the user to monitor and control a generator set, and is capable of running on a Windows based operating system. The remote monitoring software allows the user to configure data monitoring and data acquisition processes for monitoring, graphing, and logging of generator set data.

Programmable logic software



The EMCP programmable logic software package is a PC based program which allows the configuration of the programmable logic blocks, and is capable of running on a Windows based operating system. The programmable logic software allows the user to configure logic to change the operation of the EMCP control and interfaces within a limited scope.



Optional Modules (Continued)

Digital input/output module



The Digital Input/Output (DI/O) module serves to provide expandable Input and Output event capability of the EMCP 4 and is capable of reading 12 digital inputs and setting 8 relay outputs.

The DI/O module has been designed for use on the accessory Communication Network and may be used in either local (package mounted) or remote (up to 800 feet) application.

RTD module

The RTD module serves to provide expandable generator temperature monitoring capability of the EMCP 4 and is capable of reading up to eight type 2-wire, 3-wire and 4-wire RTD inputs.

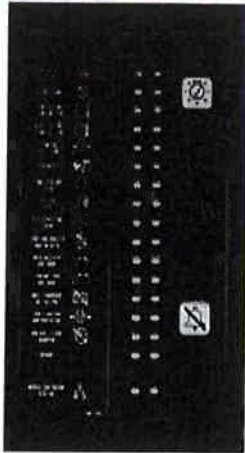
The RTD Module has been designed for use on the Accessory Communication Network and may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of one RTD Module may be used with a single EMCP 4.

Thermocouple module

The thermocouple module serves to provide expandable engine and generator temperature monitoring capability of the EMCP 4 and is capable of reading up to twenty Type J or K thermocouple inputs.

The thermocouple module has been designed for use on the primary communication network for engine information and the accessory communication network for generator information. It may be used in either local (package mounted) or remote (up to 800 feet) application. A maximum of one thermocouple modules may be used with a single EMCP 4 on each datalink.

Materials and specifications are subject to change without notice.
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Picture shown may not reflect actual configuration. Shown with Optional Equipment.

Features

- The EMCP 4 annunciator provides sixteen (16) individual points of annunciation, with two (2) LED's included for each point.
- An additional pair of LED's provides status indication of the RS-485 communication network.
- Includes alarm horn with lamp test and alarm acknowledge pushbuttons.
- Configurable to NFPA 99/110 requirements for local and remote annunciation on emergency standby generator systems.
- Provides custom label kit including software for customer's specific alarms and arrangement
- Designed and tested to meet stringent impulse shock and operating vibration requirements
- Uses high quality shielded twisted-triad cable for robust remote communications
- Graphic symbols are provided next to each pair to indicate various alarms and events
- The annunciator can be mounted remotely up to 1200 m (4,000 ft).
- Provides superior visibility of the LED's in direct sunlight.

**EMCP 4
RS-485 Annunciator**

The EMCP 4 RS-485 annunciator serves to display generator set system alarm conditions and status indications. The annunciator has been designed for use on the EMCP 4 RS-485 annunciator data link for remote applications, providing customers with enhanced site flexibility.

The EMCP 4 annunciator is configurable to the standards of NFPA 99/110 for emergency standby generator systems.

Specifications

Technical Data

Electrical

Battery Voltage Functional Range: 9 to 32 VDC

Power Consumption

Maximum: _ 12 watt at 24 VDC

Standby: _ 5 watt at 24 VDC

Control Power: 12-24 VDC

Communication: RS-485

Single, 8-pin Connector

Alarm

Sound Level 80 db

Physical

Weight 2.5 lb or _ 1.13 kg

Environmental

Operating Temperature -40° C to 70° C

-40° F to 158° F

Storage Temperature -50° C to 70° C

-58° F to 158° F

Relative Humidity 90%

Certifications

UL Recognized

Item #5: Generator Remote Annunciator Panel



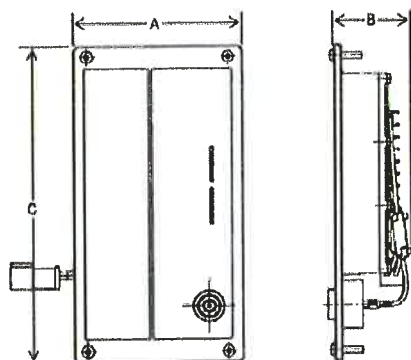
Attachments

LED Color Scheme

Each pair of LED's on the annunciator consists of two of three colors: green, yellow and red, which allows for custom configuration of status, warning and shutdown conditions.

The available colors and combinations are:

Row	LED 1	LED 2
1	Red	Yellow
2	Red	Yellow
3	Red	Yellow
4	Red	Yellow
5	Red	Yellow
6	Red	Green
7	Red	Yellow
8	Red	Yellow
9	Red	Yellow
10	Red	Yellow
11	Red	Yellow
12	Red	Yellow
13	Green	Yellow
14	Green	Yellow
15	Red	Green
16	Red	Yellow



LED Color Scheme

- Emergency stop shutdown
- Overcrank shutdown
- Low coolant temperature warning
- High coolant temperature warning/shutdown
- Low oil pressure warning/shutdown
- Overspeed warning/shutdown
- Low coolant level warning/shutdown
- Low fuel level warning/shutdown
- EPS supplying load status
- Control switch not in auto warning
- High battery voltage warning/shutdown
- Low battery voltage warning/shutdown
- BATT charger AC failure warning/shutdown
- Low cranking voltage
- Engine running
- Tier 4 SCR

Annunciator Dimensions		
A	158 mm	6.22 in
B	60 mm	2.37 in
C	288 mm	11.34 in

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www.CatElectricPower.com

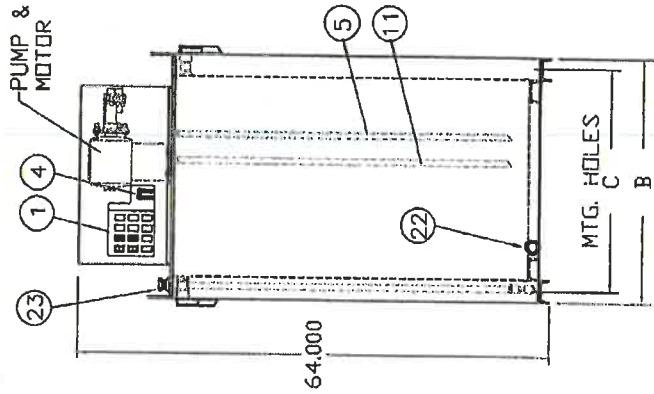
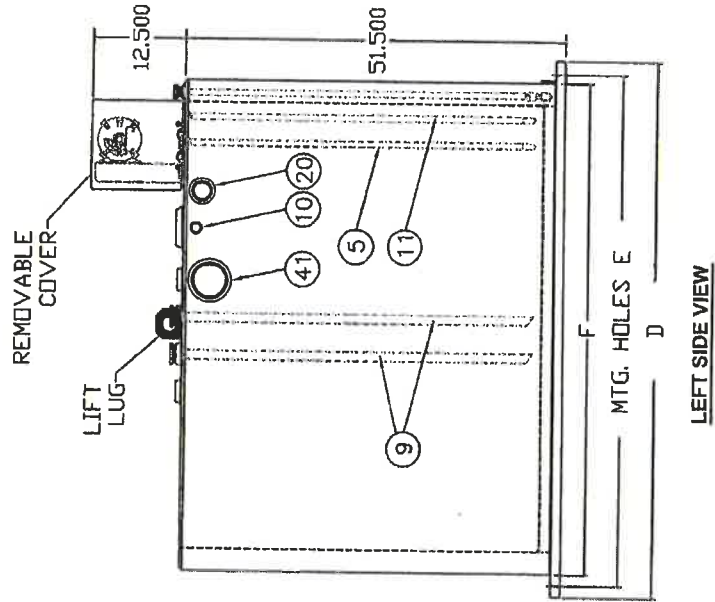
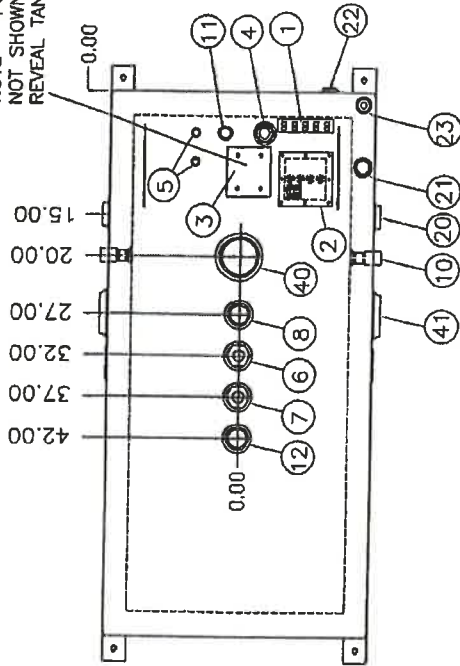
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Standard Double Wall Day Tank - PY200DW thru PY1000DW

Item #6: Standard Day Tank

PLAN VIEW

NOTE - PUMP & MOTOR NOT SHOWN IN ORDER TO REVEAL TANK OPENINGS



TANK RATED CAPACITY	B - WIDTH (COVER ALL)	C - WIDTH (CTR-TO-CTR ALL)	D - DEPTH (COVER ALL)	E - DEPTH* (MTG HOLES)	F - DEPTH* (ACTUAL TANK)	U/L VENT NPT SIZE
200 GAL	20.00	27.00	60.00	57.00	54.00	4.00
275 GAL	33.00	30.00	72.00	69.00	66.00	4.00
300 GAL	34.00	31.00	72.00	69.00	66.00	4.00
400 GAL	40.00	37.00	78.00	75.00	72.00	4.00
500 GAL	48.00	45.00	79.00	76.00	72.00	4.00
600 GAL	48.00	46.00	86.00	83.00	80.00	4.00
700 GAL	54.00	51.00	86.00	83.00	82.00	4.00
800 GAL	58.00	55.00	92.00	89.00	86.00	4.00
900 GAL	62.00	59.00	92.00	89.00	90.00	6.00
1000 GAL	64.00	61.00	102.00	99.00	96.00	6.00

* Depth dimension - Front-to-Back

NOTE - Both Tank & Double Wall Secondary Containment Area are vented.

CONTROL PANEL

1 CONTROL PANEL

2 6-1/2" x 6-1/2" INSPECTION FLATE

3 6" x 6" MOTOR MOUNTING PLATE

4 1-1/2" NPT. FUEL LEVEL GAUGE

5 FUEL INLET/OUTLET TO/FROM TANK w/DROP TUBES

6 2" x 1" NPT. ENGINE FUEL SUPPLY w/DROP TUBE

7 2" x 1" NPT. ENGINE FUEL RETURN w/DROP TUBE

8 2" NPT. TANK VENT TO ATMOSPHERE

9 1" NPT. DROP TUBES FOR ENGINE SUPPLY & RETURN

10 1" NPT. OVERFLOW TO MAIN STORAGE TANK

11 1" NPT. TANK DRAIN w/DROP TUBE (PLUGGED)

12 2" NPT. EXTRA CONNECTION

20 2" NPT. VENT TO ATMOSPHERE for DOUBLE WALL SECONDARY CONTAINMENT AREA

21 1-1/4" NPT. INSPECTION PORT for DOUBLE WALL SECONDARY CONTAINMENT AREA

22 1" NPT. Drain for DOUBLE WALL SECONDARY CONTAINMENT AREA

23 1/2" NPT. For OP TONAL LEAK DETECTOR (NOT SUPPLIED) for DOUBLE WALL SECONDARY CONTAINMENT AREA

40 NPT CONNECTION FOR U/L EMERGENCY RELIEF VENT (See Above Chart for Size)

41 NPT CONNECTION FOR U/L EMERGENCY RELIEF VENT for DOUBLE WALL SECONDARY CONTAINMENT AREA

ADDITIONAL EQUIPMENT - TANKS ARE LISTED

CONSTRUCTION NOTES

1- TANK TOP, BOTTOM & SHELL - 12 GAUGE STEEL

2- DIMENSIONS SUBJECT TO CHANGE WITHOUT NOTICE

STANDARD DOUBLE WALL DAY TANK

PY200DW - PY1000DW

PY2000LDW - PY1000LDW (U/L Listed Version)

PRYCO, INC.

MECHANICSBURG, ILLINOIS

DATE: 03/01/2008

REV: 03/01/2008

SHEET NO. 1 of 1

DWG #: STD_DW_C

Item #7: Generator Distribution Switchboard "GDB"

REV	DESCRIPTION	BY	DATE

SWITCHBOARD GENERAL NOTES -- SERIES 2

PRODUCT DESCRIPTION & RATINGS

Power System Data

480Y/277V 3Ph 4W 60Hz / 3 Phase Wye
 Solidly Grounded
 System Short Circuit Current Rating: 65KA RMS
 Incoming Section 1 Cable Through the Bottom Left of Lineup

T-Bus
 19.5 in

Bus System Data

800A Tin Plated Copper Main Bus
 (2) .25x1.50 IN/6x28 mm Cu Bus Bar Per Phase
 (1) .25x5.00 IN/6x127 mm Cu Bus Bar Per Neutral
 (1) .25x.875 IN/6x22 mm Cu Ground Bus

Enclosure Data

Type 3R Free Standing
 Exterior Paint Color: ANSI 49
 Front Accessibility Only Required
 Handling: Rollers
 Strip Heater w. Thermostat & Humidistat
 Rodent barriers
 1.5H Corrosion Resist Base Channels
 Interior Lights - All Sections
 Steel Bottom Closure Plate

Estimated Shipping Weight

Shipping Split 1 746.00 lbs / 338.39 kgs
 Shipping Split 2 935.00 lbs / 424.12 kgs
 Complete Lineup 1681.00 lbs / 762.50 kgs

Code Standards

U.L. Decadent and suitable for use as Service Entrance when not more than six (6) disconnecting means are provided.

Rating Nameplates

S11- Service Entrance - Section Bus 800A
 S12- Deadfront - Section Bus 800A

PRODUCT INFORMATION

Wiring

All wiring to be Machine Tool Wire type

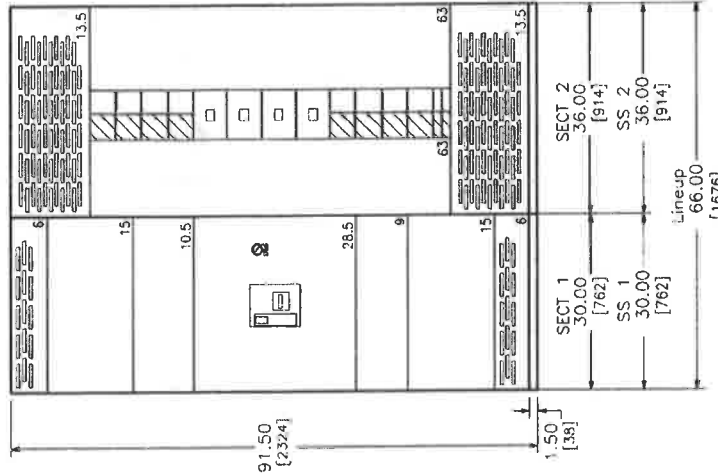
Instruction Bulletins

Reference 800A3-055 For Handling, Installation, Anchoring, Inspection And Maintenance Information

Product Accessories/Options

Certified Test Report
 Seismic Qualified
 24V Trip Unit Display Power
 Locally Mounted ERMS Switch
 Hinged Front Gutters Covers Section 2

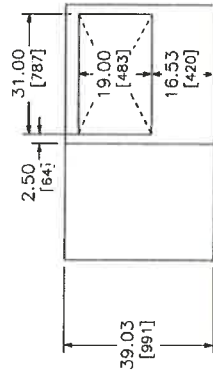
ENGLISH DIMENSIONS: INCHES



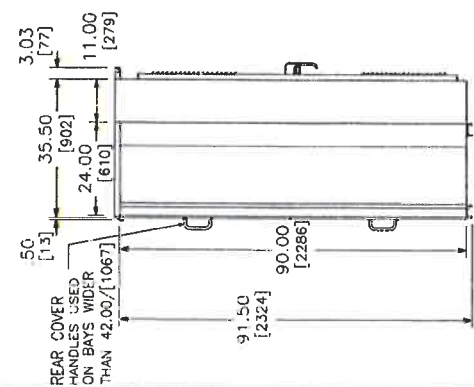
JOB NAME:	DESIGN ASSISTANCE GENERAL CONFIGURATION	EQUIPMENT DESIGNATION:	SAN CLEMENTE GDB
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:	LOZC	DRAWING TYPE:	ELEVATION VIEW
ENGR:			SQUARE
DATE:	March 10 2022		
DRAWING STATUS:	QUOTE		
		DWG#	FO-226536-8887334-01
		Pg 1	OF 2 REV -

Item #7: Generator Distribution Switchboard "GDB"

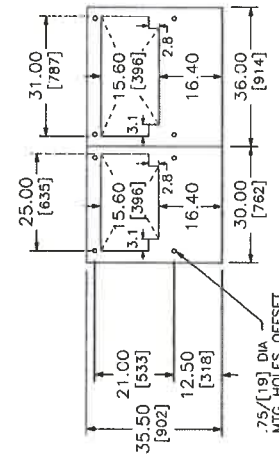
REV	DESCRIPTION	BY	DATE



TOP VIEW -- FRONT



LEFT SIDE VIEW



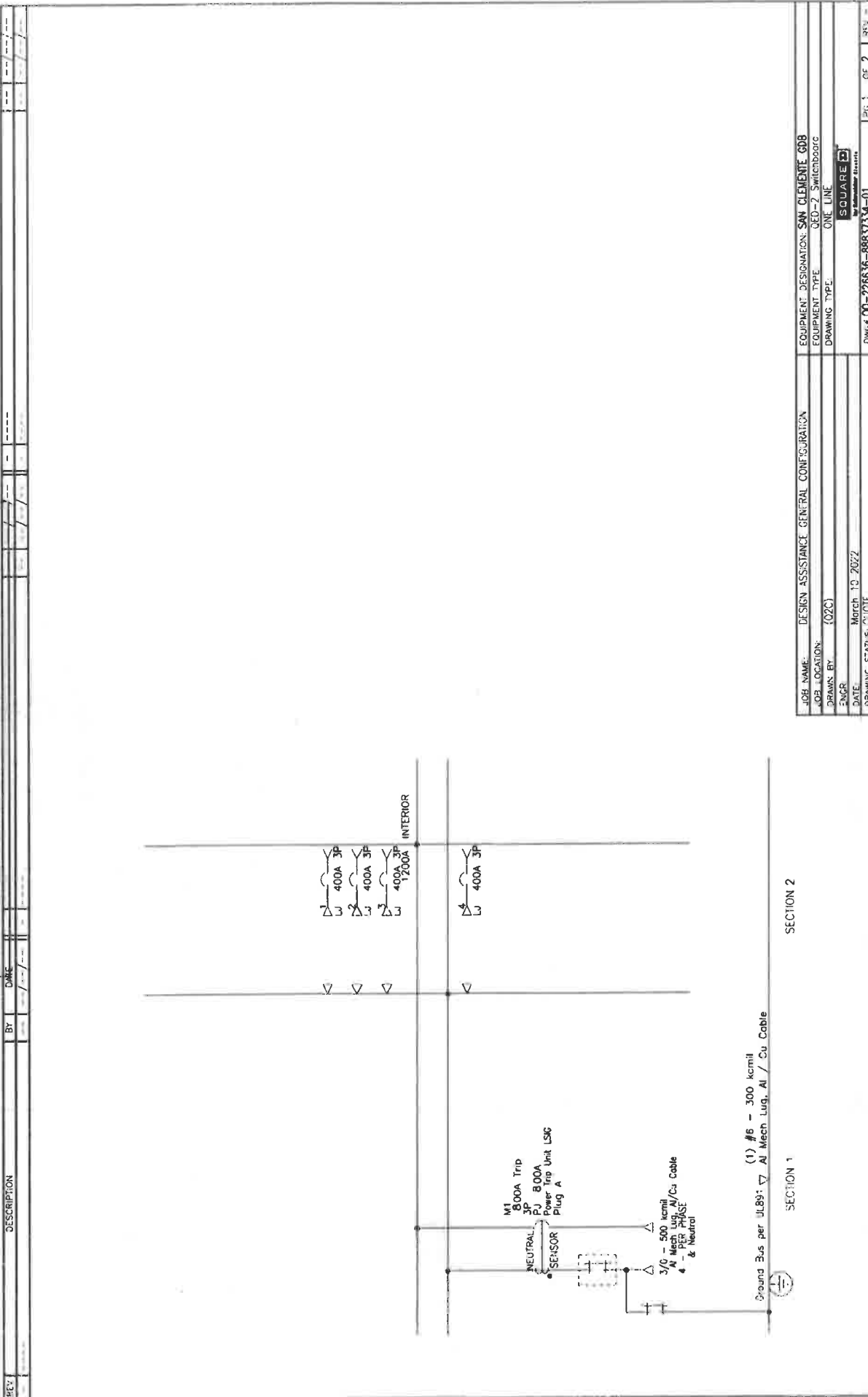
FLOOR PLAN -- FRONT

NOTE: ALL DEVICES REQUIRING DRILLING OR INSERTION IN MOUNTING PAD SUCH AS CONDUIT, ANCHORING STUDS, SLEEVE INSERTS, ETC. SHOULD BE INSTALLED BEFORE SETTING EQUIPMENT IN PLACE.

ENGLISH DIMENSIONS: INCHES

NOTE:	DESIGN ASSISTANCE GENERAL CONFIGURATION
A MINIMUM OF 2.00 [51] CLEARANCE BEHIND THE SWITCHBOARD IS REQUIRED FOR TOP COVER OVERHANG.	EQUIPMENT DESIGNATION: SAN CLEMENTE_GDB
	EQUIPMENT TYPE: CED-2 Switchboard
	DRAWING TYPE: SIDE, TOP VIEW & FLOOR PLAN
	SQUARE
	March 10, 2022
	DWG# FO-226516-88837134-01
	NOT FOR CONSTRUCTION
	PG 2 OF 2
	REV -

Item #7: Generator Distribution Switchboard "GDB"



(1) #6 - 300 kcmil
Al Mech Lug, Al / Cu Cable

JOB NAME:	DESIGN ASSISTANCE GENERAL CONFIGURATION	EQUIPMENT DESIGNATION:	SAN CLEMENTE GDB
JOB LOCATION:	(02C)	EQUIPMENT TYPE:	QED-2 Switchboard
DRAWN BY:		DRAWING TYPE:	ONE LINE
FIGR:			SQUARE
DATE:	March 13, 2022		
DRAWING STATUS:	CADTE		
		DRWG NO.:	2765616-88837334-01
		PG. 1	OF 2

Item #7: Generator Distribution Switchboard "GDB"

REV	DESCRIPTION	BY	DATE	POWER STYLE QED-2 SWITCHBOARD SERIES 2									
SECT NO	CKT NO	IMD /CMD CONF	DEVICE /FRAME RATING	TRIP AMP	FUSE /TRIP	#P	DESIGNATION	V/P	QTY	LUG /WIRE WIRE RANGE	INFORMATION	NEUT WIRE RANGE	ACCESSORIES / NOTES
1	M1	FX	Strip Heater	800A	P-LSIG	3P		No	4	3/0 - 500 kcmil		3/0 - 500 kcmil	SHR
2			Strip Heater	400A	S-LSI	3P		No	2	3/0 - 250 kcmil		3/0 - 250 kcmil	GF ERMS, TU SHR
2	2	6 in	LJ400A 100%	400A	S-LSI	3P		No	2	3/0 - 250 kcmil		3/0 - 250 kcmil	
2	3	5 in	LJ400A 100%	400A	S-LSI	3P		No	2	3/0 - 250 kcmil		3/0 - 250 kcmil	
2	4	5 in	LJ400A 100%	400A	S-LSI	3P		No	2	3/0 - 250 kcmil		3/0 - 250 kcmil	

LEGEND

ERMS	Energy Reduction	Maintenance SW
GF	Ground Fault	
SHR	Strip Heater	
TU	24V Trip Unit Display Power	

JOB NAME:	DESIGN ASSISTANCE GENERAL CONFIGURATION	EQUIPMENT DESIGNATION:	SAN CLEMENTE GDB
JOB LOCATION:		EQUIPMENT TYPE:	QED-2 SWITCHBOARD
DRAWN BY:	(02C)	DRAWING TYPE:	SCHEDULE
ENGR:			SQUARE
DATE:	March 10 2022		
DRAWING STATUS:	QUOTE		

Item #8: Automatic Transfer Switch "ATS"

Power Transfer for Mission-Critical Applications

ASCO Power
Technologies™

ASCO 7000 SERIES
Low-Voltage Transfer Switches



ascopower.com

Life Is On

Schneider
Electric

8-16-22 / 4H-60

Item #8: Automatic Transfer Switch "ATS"

7000 SERIES Power Transfer Switches

ASCO 7000 SERIES Power Transfer Switches

ASCO 7000 SERIES Power Transfer Switches provide unmatched reliability and sophisticated control for the most demanding mission-critical backup power needs.

ASCO 7000 SERIES Transfer Switches are widely used in the most complex mission-critical hospital and healthcare facilities, enterprise and cloud-based data centers, telecommunication networks, water treatment plants, and any facility that requires the highest levels of power availability.

Every 7000 SERIES transfer switch is engineered-to-order to optimize switch functionality and provide facilities with the best solution for their specific application, and custom-engineering is available to meet any transfer switching need.

Backed by industry-leading technical support and service knowledge derived from a century of critical power switching experience, the 7000 SERIES solves the most demanding critical power challenges facing facilities today.

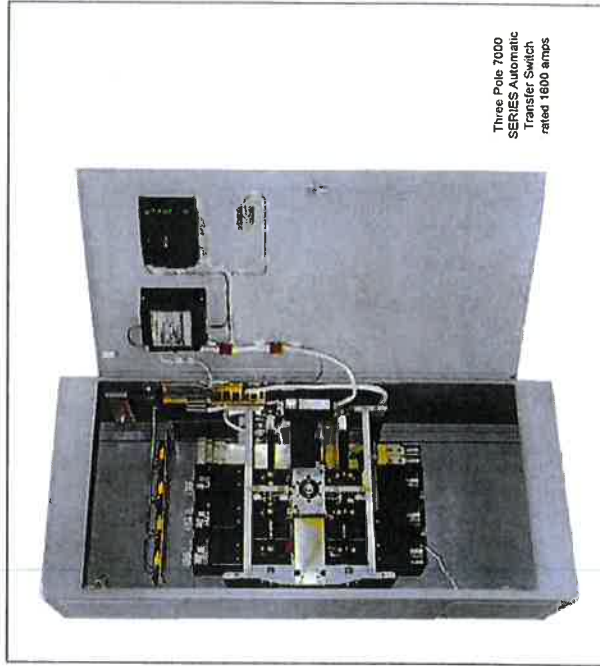


- Listed to UL 1008 Transfer Switch Equipment and Certified to CSA 22.2, No. 178
- Qualified and certified to IEC 60947-6-1, optional CE mark
- Rated up to 600 VAC, 30 through 4000 amps
- 3 to 18-Cycle Withstand and Closing Rating Standard, 30-Cycle WCR Optional
- High Withstand and Closing Rating, including Short-Time Ratings, support breaker coordination
- Solid, switched, or overlapping neutral configurations
- Front-replaceable main and arcing contacts on 800-4000 amp models
- Central terminal block for control connections on 280-4000 amp models
- Four auxiliary contacts: two closed when switch is in normal position and two closed when switch is in emergency position
- Local/remote communications to ASCO communication products
- Comprehensive 2, 5, or 10 year warranty



“With nine hospitals on the line, ASCO helps me sleep well at night.”

Tom M., Facility Engineering Director



Three Pole 7000 SERIES Automatic Transfer Switch rated 1600 amps

Item #8: Automatic Transfer Switch "ATS"

7000 SERIES Power Switching Solutions

Automatic and Non-Automatic Transfer Switching

ASCO Transfer Switches are available in automatic and non-automatic types. For automatic transfer switches, the controller initiates transfer. For non-automatic transfer switches, a user initiates transfer between power sources using local or remote switches. ASCO 7000 SERIES Transfer Switches offer the following features:

- Rated up to 600VAC, sizes from 30 through 4000 amps
- Controller prevents inadvertent operation under low voltage conditions
- Low control circuit currents allow for long distances between remotely control switches and transfer switches
- Standard in-phase monitor for transferring motor loads
- Non-automatic models provide source acceptability lights to inform operator when sources are available to accept load

Power Knowledge

Non-Automatic Transfer Switches and Manual Transfer Switches for Backup Power Applications

Open Transition Transfer Switching

ASCO Transfer Switches are available with a standard, 2-position, open transition models that reliably transfer loads in a "break-before-make" sequence in less than 100 milliseconds. Open transition switches are suitable for a wide range of applications.

- 30 to 4000 amps
- Available In-Phase Monitor can be activated for transferring motor loads
- Single-operator switching mechanism prevents simultaneous connection of both sources

Delayed Transition Transfer Switching

ASCO Delayed Transition Transfer Switches transfer loads between power sources using a timed, load, disconnect position with an adjustable delay. Applications include other variable frequency drives, rectifier banks, and load management applications.

- 150 through 4000 amps
- LED indicator for load disconnect position
- Mechanical interlocks to prevent interconnection of both sources
- Adjustable time delay for load disconnect position

Closed Transition Transfer Switching

ASCO Automatic Closed Transition Transfer Switches overlap the normal and emergency source to transfer without power interruption. The switch transfers in a make-before-break sequence if both power sources are within acceptable parameters. Control logic continuously monitors source conditions and automatically selects open or closed transition according to real-time values.

- Available 150 through 4000 amps
- Overlap time is less than 100 milliseconds
- Closed Transition Transfer occurs passively without directly controlling the engine-generator set
- Indications for failure-to-synchronize and extended parallel time



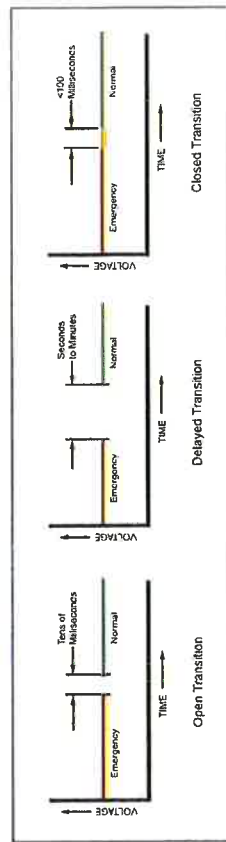
Four Pole, Non-Automatic, Electrically-Operated 400 Amp Switch in a Type 1 Enclosure

Power Knowledge

Transferring Motor Loads between Power Sources

Transition Mode Basics

Transferring Loads with Zero Power Interruption



Item #8: Automatic Transfer Switch "ATS"

7000 SERIES Bypass-Isolation Switches

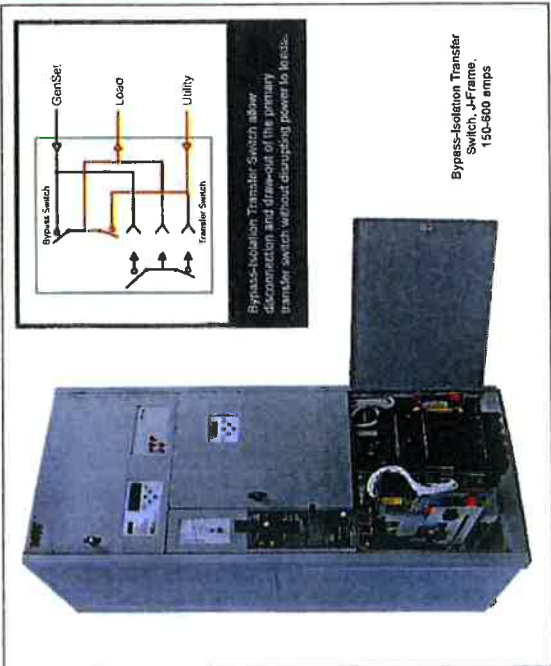
Bypass-Isolation Automatic Transfer Switches

ASCO Bypass-Isolation Automatic Transfer Switches are available in open transition, closed transition, and delayed transition designs. The bypass-isolation features allow the primary automatic transfer switch to be inspected, tested, and maintained without interrupting power to the load. They also provide redundant power transfer if the ATS is disabled or removed from service.

- 150 to 4000 amps
- Bypass switch and transfer switch have identical electrical ratings
- Mechanical interlocks prevent unintended operation
- Bypass contacts carry current only during bypass operation
- Draw-out design eases transfer switch maintenance
- Bypass switch is rated for use as a 3-position manual transfer switch
- Bypass and isolation functions require only two permanently mounted operating handles
- Mechanical indicators show bypass and transfer switch positions
- Shallow depth, front-connected, or rear-connected designs

Power Knowledge
 3D Bypass Switch Animation

Product Details
 Bypass-Isolation Transfer Switches



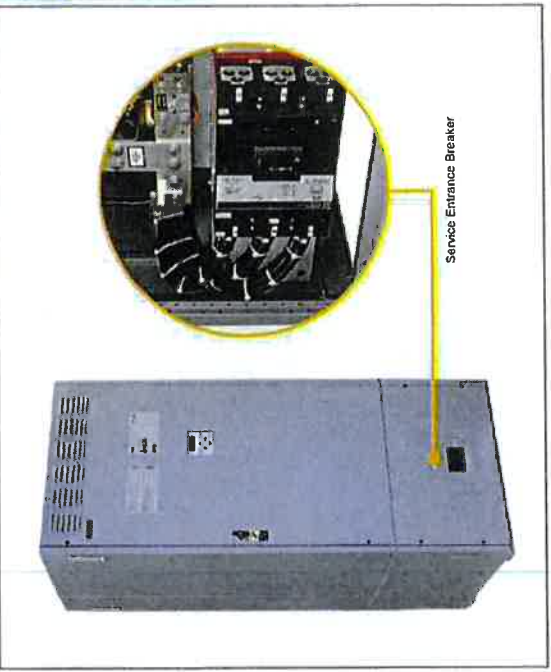
7000 SERIES Service Entrance Switches

Service Entrance Power Transfer Switches

The ASCO Service Entrance Power Transfer Switch combines automatic power switching with a disconnect and over-current protection device for the utility source. These switches are installed at facilities that have a single utility feed and a single emergency power source. A circuit breaker serves as the utility disconnect. This product is available up to 600V and 4000 amps in Standard, Delayed, Closed Transition, and Bypass-isolation configurations.

- Available from 70 to 4000 amps, up to 600V
 - 70 - 400 amp listed to UL 1008
 - 600 - 4000 amp listed to UL 891
- UL 1008 Listed transfer mechanism
- Disconnect and over-current protective device on the utility source; 70 to 2000 amp models use molded case circuit breakers; 2500 to 4000 amp models use insulated case circuit breakers.
- Disconnect links on Neutral and Ground
- Internet-enabled monitoring and control

Power Knowledge
 Applications for Service Entrance Automatic Transfer Switches



Product Details
 Service Entrance Transfer Switches

Item #8: Automatic Transfer Switch "ATS"

Custom-Engineered Transfer Switches



Custom-Engineered Solutions for Mission-Critical Environments

Create an exact power control solution by integrating service equipment and protective devices and incorporating distribution equipment while accommodating unique application requirements. Custom engineered devices can save space, reduce delivery times, streamline installation and commissioning, enhance quality control, and reduce overall cost.

Integrated Distribution Breakers

Common distribution breaker applications include:

- Panels to house molded case circuit breakers
- Manually or electrically operated circuit breakers
- Insulated case circuit breakers, with or without drawout capability

Automatic Transfer Switchboard

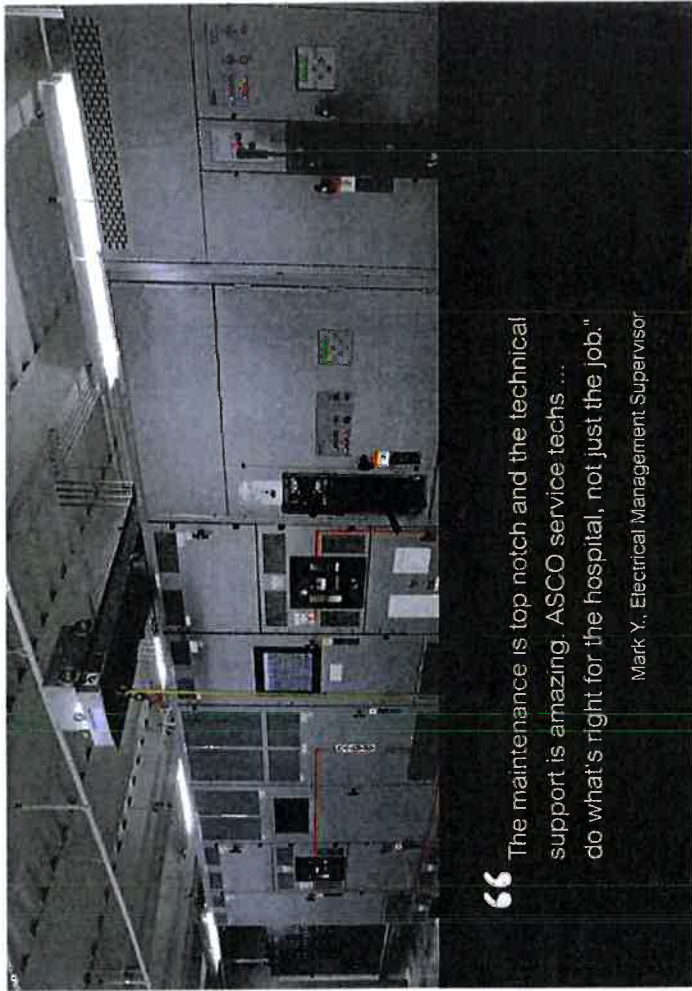
- Connects multiple automatic transfer switches together in a common switchboard
- Two ASCO 2000 ampere automatic bypass-isolation transfer switches
- Circuit breakers on the normal and load sides of each switch
- An ammeter and voltmeter are also located on the load side of each switch

Three Source System

- Sequential transfer switches select between alternative power sources
- Normal, emergency, and/or load circuit breakers
- Protective relays, when required
- Available metering for normal, emergency



Transfer Switches can be custom-engineered to integrate service entrance equipment, distribution equipment, and more.



“The maintenance is top notch and the technical support is amazing. ASCO service techs ... do what's right for the hospital, not just the job.”

Mark Y., Electrical Management Supervisor

Additional Available Custom Features

These examples are just a few of the configurations and features available through custom-engineered solutions. Additional possibilities include:

- Custom Metering
- Source Fusing
- Bus Riser
- Utility-Specified Compartments

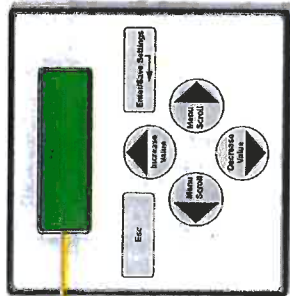
For more information, contact an authorized ASCO Power Technologies Representative.

Item #8: Automatic Transfer Switch "ATS"

7000 SERIES Controls and Indicators

Group 5 Controller

The 7000 SERIES Group 5 Controller is reliable and field-proven. It provides all of the voltage, frequency, control, timing, and diagnostic functions required for most emergency and standby power applications.



- Touch pad programming
- Displays active timers
- On-board diagnostics
- Password protection
- Voltage and frequency sensing
- Status and control functions

Source Status



In-phase Transfer Status



Voltage and Frequency Settings

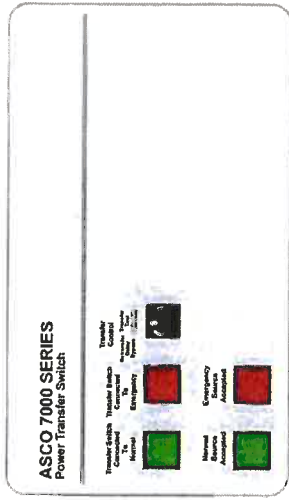


Engine Exerciser



Control Switches and Indicating Lights

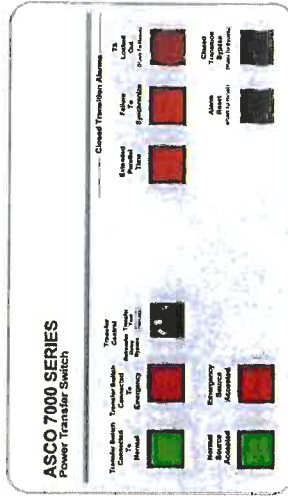
- Switch position indicating lights
- Source acceptability indicator lights
- Three-position selector switch:
 - Automatic: Normal position
 - Test: Simulate normal source failure
 - Reset Delay Bypass: Bypass transfer and re-transfer time delays



Control Switches and Indicating Lights for Closed Transition Switches

Additional controls and indicators for:

- **Extended Parallel Time** - Provides visual indication when the pre-set extended parallel time has been exceeded. The controls automatically open the emergency or normal main contacts. Separate contact also available to shunt trip external breaker.
- **Failure To Synchronize** - Visually displays a failure to synchronize alarm if the time delay settings are exceeded during closed transition transfer operation.
- **Transfer Switch Locked Out** - Prevents transfer in either direction if the extended parallel time is exceeded.
- **Alarm Reset** - Resets extended parallel and failure to synchronize alarms.
- **Closed Transition Bypass** - Pushbutton allows transfer between sources in an open transition mode.



Item #8: Automatic Transfer Switch "ATS"

Transfer Switch Communications and Metering

Options to Customize Functionality and Increase Value

Product Details

- 530C SERIES Annunciators
- 570C SERIES Annunciator

Remote Annunciation

Monitor Power Equipment Status from Anywhere

Monitoring and control transfer switches from across the room, building, or from Internet.

- 5310 – LED annunciator – Single ATS
- 5350 – LED annunciator – up to 8 ATSs
- 5705 – Interactive CPMA-based graphical annunciator – up to 8 ATSs



Product Details

- 5170 Connectivity Module
- 5701 Gateway

Communication

Turn Transfer Switches into Power Information Portals

5170 Connectivity Module – Makes status and power information from a single switch available to via ModBUS, SNMP, and web pages.

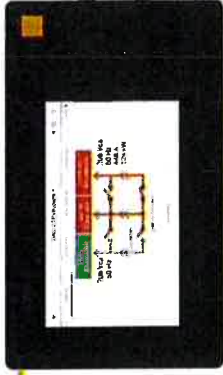
5701 8 Device Gateway – Provides centralized monitoring of up to 8 power devices through a transfer switch, connects generators, transfer switches, load banks, and more to web pages for increased monitoring and control.



Touch Display Interface

Advanced Graphical Display and Control

5370 – Graphically displays information from transfer switches and power devices. Touch display transfers, re-transfers, initiates engine start, and configures transfer switch settings.



Product Details

- 5370 Touch Display Interface

Metering

Transfer Switches are the Perfect Place to Monitor Power Flow, Power Conditions, and Power Events

5210 Power Meter – Provides deeper insight into circuit status and conditions.

PowerLogic PM 8000 – Schneider Electric's compact, high-performance, power meter simplifies power quality and maximizes versatility.



Product Details

- 5210 Power Meter
- PowerLogic PM 8000

Item #8: Automatic Transfer Switch "ATS"

7000 SERIES Optional Accessories

131	Time Delays and Extended Control Power	Auxiliary power connections provide for external 24VDC source to power control panel and power meter/energizer when normal and emergency sources are not present or the switch is in isolation mode. Allows for use of full range of extropack origins starting time delay feature IC (0-60min/59 sec).
134S1		Same as accessory 1G1; except using 120-volt AC external input.
1PS51		Extended control power rise-through (approx. 25 seconds) for Group 5 ATS controller and select communications and metering accessories, e.g. Acc. 72EE2, 72FC, 135L, etc.
Manual Controls for Automatic Transfer Switches		
5DL		Select switch for automatic/manual re-transfer to normal. Automatic bypass if emergency fails.
Indicators		
1B5		Two-pole, double-throw contacts operate when emergency source voltage is present at transfer switch terminals.
1B6		Two-pole, double-throw contacts operate when normal source voltage is present at transfer switch terminals.
95		"Push-to-Test" feature on all pilot light indicators.
Customer Control Circuits		
3DA		Lead-lag circuit initiated by opening of a customer-supplied contact.
3AB3		24 VDC logic sned circuit initiated by removal of customer-supplied control voltage. (6, 12, 48, 120 VDC and 120 VAC also available).
31Z		Selective load disconnect control contacts that operate with time delay prior to and/or after load transfer and re-transfer.
Communications		
72EE2		Offers remote Ethernet monitoring via open Mod bus and SNMP protocols, email notifications and embedded monitoring web pages. (Catalog No. 5170 for stand-alone processor).
107G		Provides Building Monitoring Systems with transfer switch, bypass, and load power metering information in Modbus TCP/IP, BACnet IP and SNMP Protocols. Compatible with any Accessory 150 Technology Package or 72EE2.
Burgle Protection - ASCO 450 TVSS, rated 200 kA per phase		
73CC1		Normal source protection. (3Ø, 4-wire WYE)
73CC2		Emergency source protection. (3Ø, 4-wire WYE)
73CC3		Load side protection. (3Ø, 4-wire WYE)
Special Applications		
28A		Manual selector switch for designating one of two utility feeds as the preferred source.
111A		Generator to Generator for Standby Applications.
729A		Seismic Certification to International Building Code for electrical equipment.
Bypass Isolation Switch Options		
14A1		ASCO certification of compliance with the American Recovery & Reinvestment Act (Buy American Provision)
14B1		Auxiliary contact to close in "Bypass to Normal" position.
14B2		Auxiliary contact to close when transfer switch is in "Emergency" position.
14L		Auxiliary contact to close when transfer switch is in "Isolate" position.
14U		Auxiliary contact to close when transfer switch is in "Test" position.
42E		LED Bypass status indicator, optional on G frame, 1600 to 4000 amps only. Standard for all other switches.
Meter and Communication Combinations		
135L		ASCO Digital Power Meter monitors load source voltage, frequency, and current and calculating Power, Energy and Power Factor.
150A		ASCO Digital Power Meter (Acc. 135L), Backup Power Source (Acc. 1PS1), Communications Module (Acc. 72EE2)
150B		5210 Power Meter with Moxa IO (Acc. 135SB), Backup Power Source (Acc. 1PS1), Comm. Module (Acc. 72EE2)
Heater		
44A		120VAC, 208-240VAC and/or 440-480VAC Accessory 44 Strip heater designed to keep humidity and/or temperature inside ATS enclosure within acceptable levels. Includes mounting bracket with strip heater, thermostat, and terminal block

Withstand and Closing Ratings

Withstand and Closing Ratings for all 7000 SERIES Power Transfer Switches, including 0.5 second (30-cycle) designs.

Frame	Switch Rating (Amperes)		Control Latching Excess		Specific Breaker		Time Based		Short Time Rating* (sec)	
	600V Max. Breaker	800V Max. Breaker	600V Max. Breaker	800V Max. Breaker	240V Max. Breaker	480V Max. Breaker	240V Max. Breaker	480V Max. Breaker	600V Max. Breaker	800V Max. Breaker
D	30	30	250A	250A	250A	250A	3.0C2	10A	10A	10A
C	75-166	75-166	200A	200A	200A	200A	0.122	10A	10A	10A
D	200	200	200A	200A	200A	200A	0.022	10A	10A	10A
D	250	250	250A	250A	250A	250A	0.022	10A	10A	10A
J	150-300-360	150-300-360	200A	200A	200A	200A	0.06	10A	10A	10A
J	400	400	200A	200A	200A	200A	0.06	10A	10A	10A
J	500	500	200A	200A	200A	200A	0.06	10A	10A	10A
J	600	600	200A	200A	200A	200A	0.06	10A	10A	10A
J	800	800	200A	200A	200A	200A	0.06	10A	10A	10A
J	1000	1000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1200	1200	200A	200A	200A	200A	0.06	10A	10A	10A
J	1500	1500	200A	200A	200A	200A	0.06	10A	10A	10A
J	1800	1800	200A	200A	200A	200A	0.06	10A	10A	10A
J	2000	2000	200A	200A	200A	200A	0.06	10A	10A	10A
J	2500	2500	200A	200A	200A	200A	0.06	10A	10A	10A
J	3000	3000	200A	200A	200A	200A	0.06	10A	10A	10A
J	4000	4000	200A	200A	200A	200A	0.06	10A	10A	10A
J	5000	5000	200A	200A	200A	200A	0.06	10A	10A	10A
J	6000	6000	200A	200A	200A	200A	0.06	10A	10A	10A
J	7500	7500	200A	200A	200A	200A	0.06	10A	10A	10A
J	10000	10000	200A	200A	200A	200A	0.06	10A	10A	10A
J	12500	12500	200A	200A	200A	200A	0.06	10A	10A	10A
J	15000	15000	200A	200A	200A	200A	0.06	10A	10A	10A
J	20000	20000	200A	200A	200A	200A	0.06	10A	10A	10A
J	25000	25000	200A	200A	200A	200A	0.06	10A	10A	10A
J	30000	30000	200A	200A	200A	200A	0.06	10A	10A	10A
J	40000	40000	200A	200A	200A	200A	0.06	10A	10A	10A
J	50000	50000	200A	200A	200A	200A	0.06	10A	10A	10A
J	60000	60000	200A	200A	200A	200A	0.06	10A	10A	10A
J	75000	75000	200A	200A	200A	200A	0.06	10A	10A	10A
J	100000	100000	200A	200A	200A	200A	0.06	10A	10A	10A
J	125000	125000	200A	200A	200A	200A	0.06	10A	10A	10A
J	150000	150000	200A	200A	200A	200A	0.06	10A	10A	10A
J	200000	200000	200A	200A	200A	200A	0.06	10A	10A	10A
J	250000	250000	200A	200A	200A	200A	0.06	10A	10A	10A
J	300000	300000	200A	200A	200A	200A	0.06	10A	10A	10A
J	400000	400000	200A	200A	200A	200A	0.06	10A	10A	10A
J	500000	500000	200A	200A	200A	200A	0.06	10A	10A	10A
J	600000	600000	200A	200A	200A	200A	0.06	10A	10A	10A
J	750000	750000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1000000	1000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1250000	1250000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1500000	1500000	200A	200A	200A	200A	0.06	10A	10A	10A
J	2000000	2000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	2500000	2500000	200A	200A	200A	200A	0.06	10A	10A	10A
J	3000000	3000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	4000000	4000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	5000000	5000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	6000000	6000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	7500000	7500000	200A	200A	200A	200A	0.06	10A	10A	10A
J	10000000	10000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	12500000	12500000	200A	200A	200A	200A	0.06	10A	10A	10A
J	15000000	15000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	20000000	20000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	25000000	25000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	30000000	30000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	40000000	40000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	50000000	50000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	60000000	60000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	75000000	75000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	100000000	100000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	125000000	125000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	150000000	150000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	200000000	200000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	250000000	250000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	300000000	300000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	400000000	400000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	500000000	500000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	600000000	600000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	750000000	750000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1000000000	1000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1250000000	1250000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	1500000000	1500000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	2000000000	2000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	2500000000	2500000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	3000000000	3000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	4000000000	4000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	5000000000	5000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	6000000000	6000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	7500000000	7500000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	10000000000	10000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	12500000000	12500000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	15000000000	15000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	20000000000	20000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	25000000000	25000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	30000000000	30000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	40000000000	40000000000	200A	200A	200A	200A	0.06	10A	10A	10A
J	50000000000	50000000000	200A							

Item #8: Automatic Transfer Switch "ATS"

Life Is On | Schneider
Electric

ASCO Power Technologies - Global Headquarters
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Florham Park, NJ 07932
Tel: 800 800 ASCO

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customercare@ascopower.com



City of San Clemente Public Works
Standby Generator Addition and Electrical Distribution System Upgrade
Preliminary Design Report

July 2022

APPENDIX C GENERATOR SIZING CALCULATIONS

**City of San Clemente
City Hall Generator and Electrical
Distribution System Upgrades**

Emergency Standby Generator Sizing Report

May 13, 2022

Prepared by:

Michael Baker

I N T E R N A T I O N A L

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Santa Ana, CA 92707

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Generator Sizing Calculation Analysis

There are several methods for sizing commercial generator:

1. Full load Capacity Measurement: Estimate the required generator capacity by taking full load current measurements using a clamp-on ammeter during peak usage at the service panel.
2. Full Load Capacity by History: Utilize the utility company's billing to find the maximum power usage.
3. Square Footage Measurement: The square footage sizing method use the following calculation for determining the generator sizing.
 - > 50KW + 5 Watts per square foot.

Full Load Capacity by History method will be used for the generator sizing calculation.

Full Load Capacity by History

Based on the utility company (PG&E) billing provided by the City, MBI selected the highest peak demand usage for the past 15 months for each service and summarized in here. Refer to Appendix B for max demand table.

Service A Peak Demand	:122.7KW
Service B Peak Demand	: 46.4KW
Service C Peak Demand	: 48KW
Service D Peak Demand	: 42.1KW
Total Peak Demands	: 259.2KW

Total peak power usage with 15% for reserve capacity: $259.2KW \times 1.15 = 298.08KW$

Total peak power usage with 25% for reserve capacity: $259.2KW \times 1.25 = 324KW$

Conclusion:

To provide backup power for the City Hall Building four services, a minimum of 300KW rated generator will be needed. MBI recommends a 350KW generator that will provide more reserve for future demand. However, a 300KW could provide sufficient power to the current load demand. The selection of the generator size and future load consideration will be by the authority having jurisdiction. The generator does not require Diesel Particulate Filter (DPF) installation since there are no sensitive receptor (such as private residences or schools) within 100 meters of the generator.

City of San Clemente City Hall Building
Maximum Demand Load Summary Table

Service Address	Account #	Valid From	Valid To	Max DMD
910 CALLE NEGOCIO A	8254479400	11/30/2021	12/29/2021	98.9
		10/29/2021	11/29/2021	92.8
		9/29/2021	10/28/2021	90.4
		8/28/2021	9/28/2021	116.2
		7/30/2021	8/27/2021	122.7
		6/30/2021	7/29/2021	118.6
		5/29/2021	6/29/2021	105.6
		4/30/2021	5/28/2021	88.6
		3/30/2021	4/29/2021	68.8
		2/28/2021	3/29/2021	95.7
		1/27/2021	2/28/2021	66.7
		12/28/2020	1/27/2021	84.3
		11/26/2020	12/28/2020	90.6
		10/27/2020	11/26/2020	71
		9/27/2020	10/27/2020	76.5

Service Address	Account #	Valid From	Valid To	Max DMD
910 CALLE NEGOCIO C	6556576648	11/30/2021	12/29/2021	43.5
		10/29/2021	11/29/2021	35.4
		9/29/2021	10/28/2021	37.4
		8/28/2021	9/28/2021	43
		7/30/2021	8/27/2021	46.1
		6/30/2021	7/29/2021	48
		5/29/2021	6/29/2021	43.8
		4/30/2021	5/28/2021	40
		3/30/2021	4/29/2021	37.6
		2/28/2021	3/29/2021	34.6
		1/27/2021	2/28/2021	33
		12/28/2020	1/27/2021	36.2
		11/26/2020	12/28/2020	32.8
		10/27/2020	11/26/2020	37.1
		9/27/2020	10/27/2020	47

City of San Clemente City Hall Building
Maximum Demand Load Summary Table

Service Address	Account #	Valid From	Valid To	Max DMD
910 CALLE NEGOCIO B	848749404	11/30/2021	12/29/2021	45.9
		10/29/2021	11/29/2021	40
		9/29/2021	10/28/2021	43.2
		8/28/2021	9/28/2021	46.4
		7/30/2021	8/27/2021	45.9
		6/30/2021	7/29/2021	45.6
		5/29/2021	6/29/2021	42.2
		4/30/2021	5/28/2021	39.7
		3/30/2021	4/29/2021	39
		2/28/2021	3/29/2021	41
		1/27/2021	2/28/2021	39
		12/28/2020	1/27/2021	41.9
		11/26/2020	12/28/2020	39
		10/27/2020	11/26/2020	37.6
		9/27/2020	10/27/2020	43

Service Address	Account #	Valid From	Valid To	Max DMD
910 CALLE NEGOCIO D	7878289061	11/30/2021	12/29/2021	33.6
		10/29/2021	11/29/2021	37.9
		9/29/2021	10/28/2021	39.8
		8/28/2021	9/28/2021	42.1
		7/30/2021	8/27/2021	10.6
		6/30/2021	7/29/2021	6.9
		5/29/2021	6/29/2021	6.7
		4/30/2021	5/28/2021	5.6
		3/30/2021	4/29/2021	6.2
		3/1/2021	3/29/2021	4.6
		1/27/2021	2/28/2021	24.5
		12/28/2020	1/27/2021	27.4
		11/26/2020	12/28/2020	23
		10/27/2020	11/26/2020	18.1
		9/27/2020	10/27/2020	22.4



Project Sizing Report

Sizing Id	10893638	Electricity Supply	60 Hz 480/277 V
Project Name	City Hall Standby Generator	Connection	STAR
Customer Name	City of San Clemente	Max. Ambient Temperature	95.0 F
Region	U.S.	Altitude	300.0 Ft. A.S.L
Prepared By	Nicole Han	Humidity	69%
Modified Date	12-May-2022		

Load Analysis Summary

Max Transient Load Step	288.0 SKVA / 259.2 SKW
Peak Transient Load Step	288.0 SKVA / 259.2 SKW
Final Running Load	288.0 KVA / 259.2 kW / 0.90 PF
Max Running Non Linear Load	288.0 RKVA
Selection Criteria	Step 1 Running kW requirements

Generator Set

Generator Set Model	(1) of C13
Model Type	IVR 2:1 slope;
Voltage Regulator and Slope	C13DE81
Feature Code	Diesel
Fuel	Conventional
Sizing Methodology	
Nameplate Rating	350.0 ekW / 437.5 kVA / 0.8 PF
Site Output Rating	350 ekW / 437.5 kVA
Rating Type	Standby
Open / Enclosure	SA Level 2
UL Listed	UL Listed
Capacity Used	74.1%

Engine

Make/Model	C13	Emissions / Certifications	EPA ESE
Aspiration	TA	Governor	ELEC
Cylinder Configuration	INLINE - 6	Aftercooler Type	ATAAC
Speed	1800 RPM	Displacement	763 Cubic Inch / 13 Liter
Engine Performance Number	EM1692	Bore	130

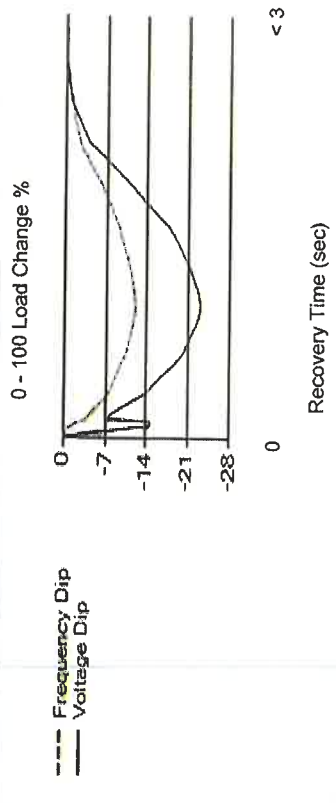
Fuel Consumption at 100% Load 24.9 gph Stroke 157

Alternator	
Alternator Type/Frame Size	LC / LC6114B
Alternator Winding Pitch	0.6667
Excitation/Winding Type	SE / RANDOM
Alternator Arrangement Number	4183863
Subtransient Reactance X"d	0.1348
Insulation Class	H
Temperature Rise	130 C
Number Of Poles	4
Number of Leads	12
Rated Amps	526.2

**** See your Caterpillar dealer and/or Spec Sheet for technical information.

***** Package Power Tolerance: +/- 5%

Block Load(Only) Transient Response *			
Load Change %	FDip %	VDip %	Recovery Time (sec)
0 - 25	<5%	<5%	< 3
0 - 50	<5%	7.9	< 3
0 - 75	7.0	13.3	< 3
0 - 100	12.0	23.1	< 3



Transient Performance

Block Load (only) Transient Response values are at factory conditions with a resistive load. This information is representative of a typical Cat generator set, but is not guaranteed. Generator set block load capabilities at site conditions may vary from factory transient response test results due to site altitude, site ambient, and engine to engine variation.



Load Report

Project Name City Hall Standby Generator **Electricity Supply** 60 Hz 480/277 V
Customer Name City of San Clemente **Rating Type** Standby
Region U.S. **Max. Ambient Temperature** 95.0 F
Prepared By Nicole Han **Altitude** 300.0 Ft. A.S.L
Modified Date 12-May-2022 **Humidity** 69%
Generator Set Model (1) of C13 **Nameplate Rating** 350.0 ekW / 437.5 kVA / 0.8 PF

Load Step	Load Description	Permitted		Predicted		Transient Inrush		Running		Resultant Peak		Cumulative Running	
		FDip	VDip	FDip	VDip	SkVA	SkW	kVA	kW	SKVA	SKW	kVA	kW
1.1	1x42.10 kW - Service D: Office Equipment, Distr. 3-Phase	30%	30%			46.8	42.1	46.8	42.1				
1.2	1x48.00 kW - Service C: Office Equipment, Distr. 3-Phase	30%	30%			53.3	48.0	53.3	48.0				
1.3	1x46.40 kW - Service B: Office Equipment, Distr. 3-Phase	30%	30%			51.6	46.4	51.6	46.4				
1.4	1x122.70 kW - Service A: Office Equipment, Distr. 3-Phase	30%	30%			136.3	122.7	136.3	122.7				
Step 1 Total		30%	30%	6.9%	12.9%	288.0	259.2	288.0	259.2	288.0	259.2	288.0	259.2

Load Analysis Summary : Generator set meets site requirements

Total Through Step 1		Maximum Step		Maximum Peak		Final Running	
FDip	VDip	SKVA	SKW	SKVA	SKW	kVA	kW
30%	30%	288.0	259.2	288.0	259.2	288.0	259.2



Engine Room Tools Summary

Project Name	City Hall Standby Generator	Electricity Supply	60 Hz 480/277 V
Customer Name	City of San Clemente	Rating Type	Standby
Region	U.S.	Max. Ambient Temperature	95.0 F
Prepared By	Nicole Han	Altitude	300.0 Ft. A.S.L
Modified Date	12-May-2022	Humidity	69%
Generator Set Model	(1) of C13	Nameplate Rating	350.0 eKW / 437.5 kVA / 0.8 PF

Fuel Tank Summary

Running Hours	72 hr	Fuel Tank Size	1,794 US gal
Fuel Consumption @ 100% Load	24.92 US gal/hr		

Radiator Duct and Room Fresh Air Louver Designer Summary

Duct Dimensions from Radiator Side (Length)	123.82 in	Combustion Airflow	881.09 ft ³ /min
Duct Dimensions from Radiator Side (Width)	80.94 in	Minimum Louver Area	0.32 ft ²
Heat Radiation from Engine & Alternator	72.63 kW	Temp Rise	-280.46 Deg. F
Engine & Alternator Airflow	0.00 ft ³ /min	Radiator Duct Area	0.22 ft ²

Exhaust Back Pressure Summary

Total Straight Pipe Length	0 ft	Exhaust Gas Flow	2,619.95 ft ³ /min
Total Number Of 90 Deg Long Radius Elbow	0	Muffler Pressure Drop	0.40 psi
Total Number Of 90 Deg Short Radius Elbow	0	Pressure Drop in Exhaust	0.00 psi
Total Number Of 45 Deg Elbow	0	Max Allowable Pressure Drop	Data coming soon

Minimum Exhaust Pipe Diameter

Stack Temperature

Gas Density



APPENDIX D
SOUTHERN CALIFORNIA AIR QUALITY MANAGEMENT DISTRICT FORMS



South Coast Air Quality Management District

Form 400-A

Application Form for Permit or Plan Approval

List only one piece of equipment or process per form.

Mail To: SCAQMD P.O. Box 4944 Diamond Bar, CA 91765-0944 Tel: (909) 396-3385 www.aqmd.gov

Section A - Operator Information

1. Facility Name (Business Name of Operator to Appear on the Permit): 2. Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 3. Owner's Business Name (If different from Business Name of Operator):

Section B - Equipment Location Address

4. Equipment Location is: Fixed Location Various Location (For equipment operated at various locations, provide address of initial site.) Street Address City, CA Zip Contact Name Title Phone # Ext. Fax # E-Mail:

Section C - Permit Mailing Address

5. Permit and Correspondence Information: Check here if same as equipment location address Address City State Zip Contact Name Title Phone # Ext. Fax # E-Mail:

Section D - Application Type

6. The Facility is: Not In RECLAIM or Title V In RECLAIM In Title V In RECLAIM & Title V Programs 7. Reason for Submitting Application (Select only ONE): 7a. New Equipment or Process Application: 7b. Facility Permits: 7c. Equipment or Process with an Existing/Previous Application or Permit: Existing or Previous Permit/Application If you checked any of the items in 7c., you MUST provide an existing Permit or Application Number: * A Higher Permit Processing Fee and additional Annual Operating Fees (up to 3 full years) may apply (Rule 301(c)(1)(D)(i)).

8a. Estimated Start Date of Construction (mm/dd/yyyy): 8b. Estimated End Date of Construction (mm/dd/yyyy): 8c. Estimated Start Date of Operation (mm/dd/yyyy):

9. Description of Equipment or Reason for Compliance Plan (list applicable rule): 10. For identical equipment, how many additional applications are being submitted with this application? (Form 400-A required for each equipment / process) 11. Are you a Small Business as per AQMD's Rule 102 definition? (10 employees or less and total gross receipts are \$500,000 or less OR a not-for-profit training center) No Yes 12. Has a Notice of Violation (NOV) or a Notice to Comply (NC) been issued for this equipment? If Yes, provide NOV/NC#: No Yes

Section E - Facility Business Information

13. What type of business is being conducted at this equipment location? 14. What is your business primary NAICS Code? (North American Industrial Classification System) 15. Are there other facilities in the SCAQMD jurisdiction operated by the same operator? No Yes 16. Are there any schools (K-12) within 1000 feet of the facility property line? No Yes

Section F - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application are true and correct.

17. Signature of Responsible Official: 18. Title of Responsible Official: 19. I wish to review the permit prior to issuance. (This may cause a delay in the application process.) No Yes 20. Print Name: 21. Date: 22. Do you claim confidentiality of data? (If Yes, see instructions.) No Yes

23. Check List: Authorized Signature/Date Form 400-CEQA Supplemental Form(s) (ie., Form 400-E-xx) Fees Enclosed

Table with columns: AQMD USE ONLY, APPLICATION TRACKING #, CHECK #, AMOUNT RECEIVED \$, PAYMENT TRACKING #, VALIDATION, DATE, APP REJ, DATE, APP REJ, CLASS I III, BASIC CONTROL, EQUIPMENT CATEGORY CODE, TEAM, ENGINEER, REASON/ACTION TAKEN



South Coast Air Quality Management District
Form 400-CEQA
California Environmental Quality Act (CEQA) Applicability

Mail To:
 SCAQMD
 P.O. Box 4944
 Diamond Bar, CA 91765-0944
 Tel: (909) 396-3385
 www.aqmd.gov

The SCAQMD is required by state law, the California Environmental Quality Act (CEQA), to review discretionary permit project applications for potential air quality and other environmental impacts. This form is a screening tool to assist the SCAQMD in clarifying whether or not the project ¹ has the potential to generate significant adverse environmental impacts that might require preparation of a CEQA document [CEQA Guidelines § 15060(a)]. Form 400-CEQA and the instructions for guidance on completing this form are available at <http://www.aqmd.gov/home/regulations/ceqa/ceqa-permit-forms> or <http://www.aqmd.gov/home/permits/permit-application-forms>. For each Form 400-A application, also complete and submit one Form 400-CEQA. If submitting multiple Form 400-A applications for the same project at the same time, only one Form 400-CEQA is necessary for the entire project. If you need assistance completing this form, contact Permit Services at (909) 396-3385.

Section A – Facility Information

1. Facility Name (Business Name of Operator to Appear on the Permit): _____ 2. SCAQMD Facility ID: _____

3. Project Description: _____

Section B – Review For Exemption From Further CEQA Action

Check "Yes" or "No" as applicable. If "Yes" is checked for any question in Section B, skip Section C and proceed to page 2 and complete Section D - Signatures.

	Yes	No	Is this application for:
1.	<input type="radio"/>	<input type="radio"/>	A request for a change of operator only (without equipment or process change modifications)?
2.	<input type="radio"/>	<input type="radio"/>	A functionally identical permit unit replacement with no increase in equipment unit rating or emissions?
3.	<input type="radio"/>	<input type="radio"/>	A change of daily VOC permit limit to a monthly VOC permit limit?
4.	<input type="radio"/>	<input type="radio"/>	Equipment damaged as a result of a disaster during state of emergency?
5.	<input type="radio"/>	<input type="radio"/>	A Title V (e.g., SCAQMD Regulation XXX) permit renewal without equipment or process change modifications?
6.	<input type="radio"/>	<input type="radio"/>	A Title V administrative permit revision?
7.	<input type="radio"/>	<input type="radio"/>	The conversion of an existing permit into an initial Title V permit?

Section C – Review of Impacts Which May Trigger Further CEQA Review

Check "Yes" or "No" as applicable. To avoid delays in processing your application(s), explain all "Yes" responses on a separate sheet and attach it to this form.

	Yes	No	
1.	<input type="radio"/>	<input type="radio"/>	Is this project specifically evaluated in a previously certified or adopted CEQA document? If "Yes" is checked, attach a copy of the signed Notice of Determination to this form.
2.	<input type="radio"/>	<input type="radio"/>	Is this project specifically exempted from CEQA by another entity (e.g., city or agency)? If "Yes" is checked, attach a copy of the signed Notice of Exemption or other documentation from the entity to this form.
3.	<input type="radio"/>	<input type="radio"/>	Is this project part of a larger project? If "Yes" is checked, attach a separate sheet to briefly describe the larger project.
4.	<input type="radio"/>	<input type="radio"/>	Will the project increase the QUANTITY of hazardous materials stored aboveground onsite or transported by mobile vehicle to or from the site by greater than or equal to the amounts associated with each compound listed on Form 400-CEQA, Table 1 - Regulated Substances List and Threshold Quantities for Accidental Release Prevention [http://www.aqmd.gov/home/regulations/ceqa/ceqa-permit-forms]? If "Yes" is checked, attach a separate sheet to identify each hazardous material and corresponding quantity to be transported, stored, or used.
5.	<input type="radio"/>	<input type="radio"/>	Will the project emit any air toxic listed on Form 400-CEQA, Table 2 - Other Air Toxics and Their Screening Levels [http://www.aqmd.gov/home/regulations/ceqa/ceqa-permit-forms]? If "Yes" is checked, attach a separate sheet to identify each air toxic and corresponding quantity to be emitted.
6.	<input type="radio"/>	<input type="radio"/>	Will the project require any demolition, excavation, and/or grading construction activities that encompass an area exceeding 20,000 square feet?

¹ A "project" means the whole of an action which has a potential for resulting in physical change to the environment, including construction activities, clearing or grading of land, improvements to existing structures, and activities or equipment involving the issuance of a permit. For example, a project might include installation of a new, or modification of an existing internal combustion engine, dry cleaning facility, boiler, gas turbine, spray coating booth, solvent cleaning tank, etc.

² Form 400-CEQA, Table 2 - Other Air Toxics and Their Screening Levels, contains a list of air toxics that either do not have a cancer potency (CP) or reference exposure level (REL) approved by the Office of Environmental Health Hazards Assessment (OEHA) or have a combination of OEHA-approved and non-approved CPs or RELs.

Section C – Review of Impacts Which May Trigger Further CEQA (concluded)

	Yes	No	
7.	<input type="radio"/>	<input type="radio"/>	Will the project utilize a boiler, engine, or other combustion equipment that uses fuel (e.g., gasoline, diesel, natural gas, liquefied petroleum gas (LPG), or landfill gas)? If "Yes" is checked, then the applicant will need to calculate the amount of GHGs from fuel use via on the Greenhouse Gas (GHG) online estimator (http://www.aqmd.gov/home/regulations/ceqa/ceqa-permit-forms), and attaching the printout or by conducting hand calculations and providing the documentation. Refer to the Instructions for Form 400-CEQA for guidance.
8.	<input type="radio"/>	<input type="radio"/>	Will the project utilize other types of equipment not addressed in Question 7 that require the use of, or will generate, any chemicals listed on Form 400-CEQA, Table 3 - Greenhouse Gases (http://www.aqmd.gov/home/regulations/ceqa/ceqa-permit-forms)? If "Yes" is checked, attach a separate sheet to identify each equipment unit, the chemical name(s), and the quantity of each chemical identified.
9.	<input type="radio"/>	<input type="radio"/>	Will the project include the open outdoor storage of dry bulk solid materials that could generate dust? If "Yes" is checked, include a plot plan with the application package.
10.	<input type="radio"/>	<input type="radio"/>	Will the project result in or make worse noticeable off-site odors from activities that may not be subject to SCAQMD permit requirements? For example, landfills, materials recovery/recycling facilities (MRF), and compost materials or other types of greenwaste (e.g., lawn clippings, tree trimmings, etc.) have the potential to generate odor complaints subject to SCAQMD Rule 402 – Nuisance.
11.	<input type="radio"/>	<input type="radio"/>	Will the project cause an increase of emissions from marine vessels, trains and/or airplanes?
12.	<input type="radio"/>	<input type="radio"/>	Will the project increase demand for potable water at the facility by more than 262,820 gallons per day? The following examples identify some, but not all, types of projects that may result in a "Yes" answer to this question: 1) a project that generates steam; 2) a project that uses water as part of operating air pollution control equipment; 3) a project that requires water as part of the production process; 4) a project that requires a new, or the expansion of an existing, sewage treatment facility, new water lines, sewage lines, sewage hook-ups etc.; 5) a project where the water demand exceeds the capacity of the local water purveyor to supply sufficient water for the project; 6) a project that requires new or the expansion of existing, water supply and conveyance facilities; and, 7) a project that requires water to hydrotest pipelines, storage tanks etc. for structural integrity.
13.	<input type="radio"/>	<input type="radio"/>	Will the project create an increase in the mass inflow of effluents to a public wastewater treatment facility that would require a new, or revision to an existing, National Pollutant Discharge Elimination System (NPDES) or other related permit at the facility?
14.	<input type="radio"/>	<input type="radio"/>	Will the project result in the need for more than 350 new employees?
15.	<input type="radio"/>	<input type="radio"/>	Will the project result in an increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round-trips per day?
16.	<input type="radio"/>	<input type="radio"/>	Will the project result in an increase in customer traffic by more than 700 visits per day?
17.	<input type="radio"/>	<input type="radio"/>	Will the project result in temporary or permanent noise or vibration in excess of what is allowed by the applicable local noise ordinance?
18.	<input type="radio"/>	<input type="radio"/>	Will the project create a permanent need for new or additional solid waste disposal? Check "No" if the projected potential amount of solid waste to be generated by the project is less than five tons per day.
19.	<input type="radio"/>	<input type="radio"/>	Will the project create a permanent need for new or additional hazardous waste disposal? Check "No" if the projected potential amount of hazardous wastes to be generated by the project is less than 42 cubic yards per day (or equivalent in pounds).
20.	<input type="radio"/>	<input type="radio"/>	Will the project include equipment that after installation or modification will change the visual character of the site and its surroundings or block views?
21.	<input type="radio"/>	<input type="radio"/>	Will the project have equipment that will create a new source of external lighting that will be visible at the property line?

Section D – SIGNATURES

I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE. I UNDERSTAND THAT THIS FORM IS A SCREENING TOOL AND THAT THE SCAQMD RESERVES THE RIGHT TO CONSIDER OTHER PERTINENT INFORMATION IN DETERMINING CEQA APPLICABILITY.

1. Signature of Responsible Official of Firm:		2. Title of Responsible Official of Firm:	
3. Print Name of Responsible Official of Firm:		4. Date Signed:	
5. Phone # of Responsible Official of Firm:	6. Fax # of Responsible Official of Firm:	7. Email of Responsible Official of Firm:	
8. Signature of Preparer, (if prepared by person other than responsible official of firm):		9. Title of Preparer:	
10. Print Name of Preparer:		11. Date Signed:	
12. Phone # of Preparer:	13. Fax # of Preparer:	14. Email of Preparer:	

THIS CONCLUDES FORM 400-CEQA. INCLUDE THIS FORM AND ANY ATTACHMENTS WITH FORM 400-A.



South Coast Air Quality Management District

FORM 400-E-13a

Emergency Internal Combustion Engine

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765
Tel: (909) 396-3385
www.aqmd.gov

Permit to be issued to (Business name of operator to appear on permit):

Street location where the equipment will be operated (for equipment which will be moved to various location in SCAQMD's jurisdiction, please list the initial location site):

Section A: Equipment Information

Internal Combustion Engine	Manufacturer:	Model No.:	Serial No.:
	EPA Family No.:	Date of Manufacture: _____ (mm/dd/yyyy) For an ICE manufactured after 7/18/94, please provide manufacturer's specification.	
	Manufacturer Maximum Rating: _____ BHP @ _____ RPM	Date of Installation: _____ (mm/dd/yyyy)	

ICE Emergency Function

Electrical Generator
 Fire Pump
 Flood Control
 Pump Driver
 Compressor
 Water Pump
 Other _____

Type

Fixed site
 Portable
 How Is This Type of Equipment Used? (Check All That Apply)
 Within Facility
 Off-Site
 Rental

Fuel

Diesel Oil
 LPG
 Natural Gas
 Other: _____

Cycle Type

Two Cycle
 Four Cycle

Combustion Type

Lean Burn
 Rich Burn

Engine Size

_____ liters

No. of Cylinders

Four
 Six
 Eight
 Ten
 Twelve
 Sixteen
 Other _____

Aspiration Type

Naturally Aspirated
 Turbocharged
 Turbocharged/Aftercooled

Air Pollution Control

Check all that apply:

Selective Catalytic Reduction (SCR)*
 Catalytic Converter
 Selective Non-catalytic Reduction (SNCR)*
 Air/Fuel Ratio Controller
 Non-selective Catalytic Reduction (NSCR)
 No Controls
 Diesel Particulate Filter (DPF)
 Other (specify) _____

Manufacturer: _____ Model No. _____

If already permitted, indicate Permit No. _____ Device No. _____ (RECLAIM and/or Title V Permits)

* Separate application is required.

Additional Information for Diesel Particulate Filter (DPF)

Filter Efficiency: _____ %

CARB Certified? Yes No

If Yes, provide a copy of the CARB Verification Certificate, or provide the Verification No. _____

Installing a backpressure relief system? Yes No

Section B: Operation Information

Fuel Consumption	Maximum Load: _____ gal/hr OR _____ cu ft/hr	Average Load: _____ gal/hr OR _____ cu ft/hr
	Normal: _____ hours/day _____ days/week _____ weeks/year	
Operating Schedule	Maximum: _____ hours/day _____ days/week _____ weeks/year	
	Testing & Maintenance: _____ hours/year	

Section C: Engine Data

Is the engine EPA certified?

Yes Provide a copy of EPA's Engine Certification.

Choose one: Tier I Tier II Tier III Tier IV (Interim) Tier IV

No Provide a copy of the Manufacturer's Emissions Data.

If manufacturer's emissions data is not available, provide available emissions data below. Provide supporting documents.

Carbon Monoxide (grams/bhp-hr)	Hydrocarbons (grams/bhp-hr)	Oxides of Nitrogen (grams/bhp-hr)	Hydrocarbons + Oxides of Nitrogen (grams/bhp-hr)	Particulate Matter (grams/bhp-hr)

Section D: Sensitive Receptors

A. Distance from engine stack to the fence line of the nearest sensitive receptor (i.e., long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools (K-12), playgrounds, child care centers, and athletic facilities):

Type of Facility	Name of Facility	Distance (feet)

Section E: Applicant Certification Statement

I hereby certify that all information contained herein and submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	
CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT :	CONTACT PERSON'S TELEPHONE NUMBER	DATE SIGNED:

THIS IS A PUBLIC DOCUMENT

Pursuant to the California Public Records Act, your permit application and any supplemental documentation are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as a trade secret, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such claim at the time of submittal to the District.

Check here if you claim that this form or its attachments contain confidential trade secret information.

RULE EVALUATION

The internal combustion engine may be subject to the following rules:

SCAQMD Rules and Regulations	
Rule 212	Standards for Approving Permits and Issuing Public Notice
Rule 401	Visible Emissions
Rule 402	Nuisance
Rule 404	Particulate Matter – Concentration
Rule 431.1	Sulfur Content of Gaseous Fuels
Rule 431.2	Sulfur Content of Liquid Fuels Liquid fuels – sulfur content of 500 ppm by weight or less Diesel fuel – sulfur content of 0.015% by weight or less.
Reg XIII	New Source Review
Rule 1401	New Source Review of Toxic Air Contaminants
Rule 1401.1	Requirements for New and Relocated Facilities Near Schools
Rule 1470	Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines
Rule 1472	Requirements for Facilities with Multiple Stationary Emergency Standby Diesel-Fueled Internal Combustion Engines
Rule 1714	Prevention of Significant Deterioration for Greenhouse Gases
Code of Federal Regulations	
40 CFR 60 Subpart III	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines
40 CFR 60 Subpart JJJJ	Standards of Performance for New Stationary Sources
40 CFR 63 Subpart ZZZZ	National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

SAMPLE CONDITIONS FOR EMERGENCY INTERNAL COMBUSTION ENGINES (GENERATORS)

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED.
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITIONS AT ALL TIMES.
3. THE OPERATOR SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF SCAQMD RULE 431.2, SCAQMD RULE 1470, 40CFR PART 60 SUBPART IIII AND 40 CFR PART 63 SUBPART ZZZZ, OR THE OPERATOR SHALL NOT USE ANY DIESEL FUEL UNLESS THE FUEL IS LOW SULFUR DIESEL FOR WHICH THE SULFUR CONTENT SHALL NOT EXCEED 15 PPM BY WEIGHT AS SUPPLIED BY THE SUPPLIER.
4. THIS ENGINE SHALL NOT OPERATE MORE THAN 200 HOURS IN ANY ONE YEAR, WHICH INCLUDES NO MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING.
5. THE OPERATION OF ENGINE BEYOND 50 HOURS PER YEAR ALLOTTED FOR ENGINE MAINTENANCE AND TESTING SHALL BE ALLOWED ONLY IN THE EVENT OF A LOSS OF GRID POWER OR UP TO 30 MINUTES PRIOR TO A ROTATING OUTAGE, PROVIDED THAT THE ELECTRICAL GRID OPERATOR OR ELECTRIC UTILITY HAS ORDERED ROTATING OUTAGES IN THE CONTROL AREA WHERE THE ENGINE IS LOCATED OR HAS INDICATED THAT IT EXPECTS TO ISSUE SUCH AN ORDER AT A CERTAIN TIME, AND THE ENGINE IS LOCATED IN A UTILITY SERVICE BLOCK THAT IS SUBJECT TO THE ROTATING OUTAGE. ENGINE OPERATION SHALL BE TERMINATED IMMEDIATELY AFTER THE UTILITY DISTRIBUTION COMPANY ADVISES THAT A ROTATING OUTAGE IS NO LONGER IMMINENT OR IN EFFECT.
6. AN OPERATIONAL NON-RESETTABLE TOTALIZING TIME METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
7. ON OR BEFORE JANUARY 15TH OF EACH YEAR THE OPERATOR SHALL RECORD IN THE ENGINE OPERATING LOG:
 - A. THE TOTAL HOURS OF ENGINE OPERATION FOR THE PREVIOUS CALENDAR YEAR, AND
 - B. THE TOTAL HOURS OF ENGINE OPERATION FOR MAINTENANCE AND TESTING FOR THE PREVIOUS CALENDAR YEAR.

ENGINE OPERATION LOG(S) SHALL BE RETAINED ON SITE FOR A MINIMUM OF FIVE CALENDAR YEARS AND SHALL BE MADE AVAILABLE TO THE EXECUTIVE OFFICER OR REPRESENTATIVE UPON REQUEST.

8. THE OPERATOR SHALL KEEP A LOG OF ENGINE OPERATIONS DOCUMENTING THE TOTAL TIME THE ENGINE IS OPERATED EACH MONTH AND THE SPECIFIC REASON FOR OPERATION AS:
 - A. EMERGENCY USE
 - A. MAINTENANCE AND TESTING
 - C. OTHER (BE SPECIFIC)

IN ADDITION, FOR EACH TIME THE ENGINE IS MANUALLY STARTED, THE LOG SHALL INCLUDE: THE DATE OF ENGINE OPERATION, THE START AND STOP TIME OF THE ENGINE, THE SPECIFIC REASON FOR OPERATION, AND THE TOTALIZING HOUR METER READING (IN HOURS AND TENTHS OF HOURS) AT THE BEGINNING AND THE END OF THE OPERATION.

9. THIS ENGINE SHALL NOT BE USED AS PART OF A DEMAND RESPONSE PROGRAM USING INTERRUPTIBLE SERVICE CONTRACT IN WHICH A FACILITY RECEIVES A PAYMENT OR REDUCED RATES IN RETURN FOR REDUCING ITS ELECTRIC LOAD ON THE GRID WHEN REQUESTED TO DO SO BY THE UTILITY OR THE GRID OPERATOR.

10. THIS ENGINE SHALL NOT BE OPERATED MORE THAN 200 HOURS IN ANY ONE YEAR, WHICH INCLUDES NO MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING TO COMPLY WITH REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). ANYTHING IN EXCESS OF 50 HOURS SHALL BE ALLOWED ONLY IN THE EVENT OF AN EMERGENCY FIRE FIGHTING OPERATION.

For Fire pumps:

11. THIS ENGINE SHALL NOT BE OPERATED MORE THAN 200 HOURS IN ANY ONE YEAR, WHICH INCLUDES NO MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING TO COMPLY WITH REQUIREMENTS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). ANYTHING IN EXCESS OF 50 HOURS SHALL BE ALLOWED ONLY IN THE EVENT OF AN EMERGENCY FIRE FIGHTING OPERATION.

For Various Locations Equipment:

12. UPON THE FIFTH DAY AFTER PLACEMENT OF THIS EQUIPMENT INTO OPERATION AT A NEW SITE, THE DISTRICT SHALL BE NOTIFIED VIA TELEPHONE AT 877-810-6995 OF THE EXACT NATURE OF THE PROJECT AS FOLLOWS:
 - A. THE PERMIT NUMBER OF THE PORTABLE EQUIPMENT.
 - B. THE NAME AND TELEPHONE NUMBER OF A CONTACT PERSON.
 - C. THE LOCATION WHERE THE PORTABLE EQUIPMENT WILL BE OPERATED.
 - D. THE ESTIMATED TIME THE PORTABLE EQUIPMENT WILL BE LOCATED AT THE SITE.
 - E. DESCRIPTION OF THE PROJECT.
 - F. IF LESS THAN 1/4 MILE, THE DISTANCE TO THE NEAREST SENSITIVE RECEPTOR. SENSITIVE RECEPTORS ARE DEFINED AS LONG-TERM HEALTH CARE FACILITIES, REHABILITATION CENTERS, CONVALESCENT CENTERS, RETIREMENT HOMES, RESIDENCES, SCHOOLS, PLAYGROUNDS, CHILD CARE CENTERS, AND ATHLETIC FACILITIES.
13. THIS ENGINE AND ITS REPLACEMENT UNIT INTENDED TO PERFORM THE SAME OR SIMILAR FUNCTION, SHALL NOT RESIDE AT ANY ONE LOCATION FOR MORE THAN 12 CONSECUTIVE MONTHS. THE PERIOD DURING WHICH THE ENGINE AND ITS REPLACEMENT IS MAINTAINED AT A STORAGE FACILITY SHALL BE EXCLUDED FROM RESIDENCY TIME DETERMINATION.
14. THIS ENGINE SHALL NOT BE REMOVED FROM ONE LOCATION FOR A PERIOD OF TIME, AND THEN IT OR ITS EQUIVALENT ENGINE RETURNED TO THE SAME LOCATION, IN ORDER TO CIRCUMVENT THE PORTABLE ENGINE RESIDENCE TIME REQUIREMENTS.
15. IN ADDITION TO MAINTENANCE AND TESTING OF THIS ENGINE, THIS ENGINE SHALL ONLY BE USED FOR EITHER PROVIDING ELECTRICAL POWER TO PORTABLE OPERATIONS OR EMERGENCY POWER TO STATIONARY SOURCES. PORTABLE OPERATIONS ARE THOSE WHERE IT CAN BE DEMONSTRATED THAT BECAUSE OF THE NATURE OF THE OPERATION, IT IS NECESSARY TO PERIODICALLY MOVE THE EQUIPMENT FROM ONE LOCATION TO ANOTHER. EMERGENCIES AT STATIONARY SOURCES ARE THOSE THAT RESULT IN AN INTERRUPTION OF SERVICE OF THE PRIMARY POWER SUPPLY OR DURING STAGE II OR III ELECTRICAL EMERGENCIES DECLARED BY THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR.



City of San Clemente Public Works
Standby Generator Addition and Electrical Distribution System Upgrade
Preliminary Design Report

July 2022

APPENDIX E
CALIFORNIA ENVIRONMENTAL QUALITY ACT
NOTICE OF EXEMPTION FORMS

Notice of Exemption

Appendix E

To: Office of Planning and Research
 P.O. Box 3044, Room 113
 Sacramento, CA 95812-3044
 County Clerk
 County of: _____

From: (Public Agency): _____

 (Address)

Project Title: _____

Project Applicant: _____

Project Location - Specific: _____

Project Location - City: _____ Project Location - County: _____

Description of Nature, Purpose and Beneficiaries of Project: _____

Name of Public Agency Approving Project: _____

Name of Person or Agency Carrying Out Project: _____

Exempt Status: (check one):

- Ministerial (Sec. 21080(b)(1); 15268);
- Declared Emergency (Sec. 21080(b)(3); 15269(a));
- Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- Categorical Exemption. State type and section number: _____
- Statutory Exemptions. State code number: _____

Reasons why project is exempt: _____

Lead Agency
 Contact Person: _____ Area Code/Telephone/Extension: _____

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? Yes No

Signature: _____ Date: _____ Title: _____

Signed by Lead Agency Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
 Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: _____



APPENDIX F SPECIFICATIONS

Specification List:

- 16441 – Distribution Switchboard – For Order Purpose Only
- 16446 – Automatic Transfer Switch – For Order Purpose Only
- 16620 – Standby Engine Generators – For Order Purpose Only

SECTION 16441: GENERATOR DISTRIBUTION SWITCHBOARD

PART 1- GENERAL

1.01 DESCRIPTION OF WORK

- A. This section includes the main metered switchboard.
- B. Related Sections:
 - 1. Section 16050 – Basic Electrical Materials and Methods.

1.02 REFERENCES

- A. ANSI C12.1 - Code for Electricity Metering.
- B. ANSI C39.1 - Electrical Analog Indicating Instruments.
- C. ANSI C57.13 - Instrument Transformers.
- D. IEEE C62.41 (Institute of Electrical and Electronics Engineers) - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.
- E. NEMA AB 1 (National Electrical Manufacturers Association) - Molded Case Circuit Breakers.
- F. NEMA KS 1 (National Electrical Manufacturers Association) - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).
- G. NEMA PB 2 (National Electrical Manufacturers Association) - Dead Front Distribution Switchboards.
- H. NEMA PB 2.1 (National Electrical Manufacturers Association) - Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less.
- I. NETA ATS (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.03 SUBMITTALS

- A. Submittals shall be in accordance with the General Conditions.
- B. Shop Drawings: Indicate front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars for each phase, neutral, and ground; and switchboard instrument details.
- C. Product Data: Submit electrical characteristics including voltage, frame size and trip ratings, fault current withstand ratings, and time-current curves of equipment and components.

- D. Submit utility company approval of the switchboard.
 - E. The switchboard shall be approved by the serving utility prior to fabrication.
- 1.04 CLOSEOUT SUBMITTALS
- A. Project Record Documents: Record actual locations, configurations, and ratings of switchboards and their components on single line diagrams and plan layouts.
 - B. Operation and Maintenance Data: Submit the spare parts data listing; source and current prices of replacement parts and supplies; and the recommended maintenance procedures and intervals.
- 1.05 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing products specified in this section with a minimum of 3-years documented experience.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A. Deliver in 48-inch maximum width shipping splits, individually wrapped for protection and mounted on shipping skids.
 - B. Accept switchboards on site. Inspect for damage.
 - C. Store in clean, dry space. Maintain factory wrapping or provide additional canvas or plastic cover to protect units from dirt, water, construction debris, and traffic.
 - D. Handle in accordance with NEMA PB 2.1. Lift only with lugs provided. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.
- 1.07 ENVIRONMENTAL REQUIREMENTS
- A. Conform to NEMA PB 2 service conditions during and after installation of switchboards.
- 1.08 FIELD MEASUREMENTS
- A. Verify field measurements prior to fabrication.
- 1.09 SEQUENCING
- A. Sequence work to avoid interferences with building finishes and installation of other products.

PART 2 - PRODUCTS

2.01 GENERATOR DISTRIBUTION SWITCHBOARD

- A. Product Description: NEMA PB 2, enclosed switchboard with electrical ratings and configurations as indicated on the Drawings.
- B. Bus:
 - 1. Material: Copper with tin plating, standard size.
 - 2. Connections: Bolted, accessible from front for maintenance.
- C. Ground Bus: Insulated, extend length of switchboard.
- D. Line and Load Terminations: Accessible from front only of switchboard, suitable for conductor materials and sizes as indicated on the Drawings.
- E. Utility Metering Compartment (NOT APPLICABLE): Furnish metering transformer compartment for the utility company's use, in accordance with utility company requirements.
- F. Pull Section: Size as indicated on the drawings. Arrange as indicated on the Drawings.
- G. Pull Box: Removable top and sides, same construction as switchboard, size as indicated on the Drawings. Furnish insulating, fire-resistive bottom with separate openings for each circuit to pass into switchboard.
- H. Enclosure: NEMA Type 3R - Weatherproof.
- I. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.
- J. Generator distribution switchboard shall be Eaton, SquareD or equal.

2.02 CIRCUIT BREAKER

- A. Product Description: NEMA AB 1, molded-case 100 percent rated solid-state circuit breaker. Ampere rating shall be as indicated on the Drawings.
- B. Solid State Circuit Breaker: Electronic sensing, timing, and tripping circuits for adjustable current settings; instantaneous trip; and adjustable short time trip.
- C. Provide the number of circuit breakers as indicated on the Drawings.

2.03 SOURCE QUALITY CONTROL

- A. Furnish shop inspection and testing in accordance with NEMA PB 2.

- B. Make completed switchboard available for inspection at the manufacturer's factory prior to packaging for shipment. Notify the Owner at least 7 days before inspection is allowed.
- C. Allow witnessing of factory inspections and tests at the manufacturer's test facility. Notify the Owner at least 7 days before inspections and tests are scheduled.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify surface is suitable for switchboard installation.

3.02 INSTALLATION (APPLICABLE DURING CONSTRUCTION PHASE)

- A. Install in accordance with NEMA PB 2.1.
- B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.
- C. Install engraved plastic nameplates in accordance with Section 16050.
- D. Ground and bond switchboards in accordance with Section 16050.

3.03 FIELD QUALITY CONTROL

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.1.
- C. Perform ground fault test per NEC 230-95 and submit written record of the test.

3.04 ADJUSTING

- A. Adjust operating mechanisms for free mechanical movement.
- B. Tighten bolted bus connections.
- C. Adjust circuit breaker trip and time delay settings to values as instructed by the Engineer.

3.05 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.

END OF SECTION

SECTION 16446: AUTOMATIC TRANSFER SWITCHES

PART 1 - GENERAL

1.01 SUMMARY

- A. Furnish and install delayed transition automatic transfer switches with number of poles, amperage, voltage, and withstand current ratings as shown on the Plans. Each ATS shall consist of a power transfer switch unit and a control panel interconnected to provide complete automatic operation.

1.02 REFERENCES

The delayed transition transfer switches and controls shall conform to the requirements of:

- A. UL 1008 - Standard for Transfer Switch Equipment
- B. NFPA 70 - National Electrical Code
- C. NFPA 110 - Emergency and Standby Power Systems
- D. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

1.03 SUBMITTALS

- A. Product Data: Submit catalog sheets showing voltage, switch dimensions, ratings of switches, operating logic, wiring diagrams, short circuit ratings, dimensions, pull section, and enclosure details.

PART 2 - PRODUCTS

2.01 MECHANICALLY HELD TRANSFER SWITCH

- A. Automatic transition transfer switches shall be Eaton, ASCO transfer switch or equal.
- B. The transfer switch unit shall be electrically operated and mechanically held. The electrical operator shall be a solenoid mechanism, momentarily energized. The transfer switch unit shall include both electrical and mechanical interlocks to prevent both sets of main contacts from being closed at the same time. Main operators that include overcurrent disconnect devices OR do not include electrical and mechanical interlocks will not be accepted.
- C. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts.
- D. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life.

- E. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts.
- F. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 600 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars.
- G. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources, are not acceptable.
- H. Where neutral conductors are to be solidly connected as shown on the Plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided.

2.02 MICROPROCESSOR CONTROLLER

- A. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module.
- B. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to ± 1 percent of nominal voltage. Frequency sensing shall be accurate to ± 0.2 percent. The panel shall be capable of operating over a temperature range of -20°C to $+60^{\circ}\text{C}$ and storage from -55°C to $+85^{\circ}\text{C}$.
- C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. The protective cover shall include a built-in pocket for storage of the operator's manuals.
- D. All customer connections shall be wired to a common terminal block to simplify field-wiring connections.

2.03 ENCLOSURE

- A. The ATS shall be furnished in a Type 3R enclosure.
- B. All standard and optional door-mounted switches and pilot lights shall be 16-mm industrial grade type or equivalent for easy viewing and replacement. Door controls shall be provided on a separate removable plate, which can be supplied loose for open type units.

- C. Maximum dimension of switch shall be as shown on the Drawings.

2.04 CONTROLLER DISPLAY AND KEYPAD

- A. A four-line, 20-character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The following parameters shall only be adjustable via DIP switches on the controller:

1. Nominal line voltage and frequency
2. Single or three phase sensing
3. Operating parameter protection
4. Transfer operating mode configuration
(Open transition, Closed transition, or Delayed transition)

All instructions and controller settings shall be easily accessible, readable and accomplished without the use of codes, calculations, or instruction manuals.

2.05 VOLTAGE, FREQUENCY AND PHASE ROTATION SENSING

- A. Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout and trip setting capabilities (values shown as % of nominal unless otherwise specified):

<u>Parameter</u>	<u>Sources</u>	<u>Dropout/Trip</u>	<u>Pickup/Reset</u>
Undervoltage	N&E,3f	70 to 98%	85 to 100%
Overvoltage	N&E,3f	102 to 115%	2% below trip
Underfrequency	N&E	85 to 98%	90 to 100%
Overfrequency	N&E	102 to 110%	2% below trip
Voltage unbalance	N&E	5 to 20%	1% below dropout

- B. Repetitive accuracy of all settings shall be within ± 0.5 percent over an operating temperature range of -20°C to 60°C .
- C. Voltage and frequency settings shall be field adjustable in 1 percent increments either locally with the display and keypad or remotely via serial communications port access.
- D. The controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or CBA).
- E. Source status screens shall be provided for normal and emergency to provide digital readout of voltage on all three phases, frequency, and phase rotation.

2.06 TIME DELAYS

- A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 30 minutes by providing an external 24 VDC power supply.
- B. A time delay shall be provided on transfer to emergency, adjustable from 0 to 30 minutes, for controlled timing of transfer of loads to emergency.
- C. An adjustable time delay of 0 to 6 seconds to override momentary emergency source outage to delay all retransfer signals during initial loading of engine generator set.
- D. Two time-delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 30 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable.
- E. A time delay shall be provided on shut down of engine generator for cool down, adjustable from 0 to 30 minutes.
- F. A time delay activated output signal shall also be provided to drive an external relay(s) for selective load disconnect control. The controller shall have the ability to activate an adjustable 0 to 5 minute time delay in any of the following modes:
 1. Prior to transfer only.
 2. Prior to and after transfer.
 3. Normal to emergency only.
 4. Emergency to normal only.
 5. Normal to emergency and emergency to normal.
 6. All transfer conditions or only when both sources are available.
 7. The controller shall also include the following built-in time delay for Delayed/Transition operation:
 - a. 0 to 5 minute time delay for the load disconnect position for delayed transition operation.
 - b. All time delays shall be adjustable in 1-second increments, except the extended parallel time, which shall be adjustable in .01-second increments.
 - c. All time delays shall be adjustable by using the LCD display and keypad or with a remote device connected to the serial communications port. The time delay value displayed on the LCD

or remote device shall be the remaining time until the next event occurs.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install housekeeping pads as shown on the Drawings.
- B. Install engraved plastic nameplates.

3.02 FIELD QUALITY CONTROL

- A. 2003 Greenbook Section 4 - Quality Requirements: Testing and Inspection Services.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.22.3.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Check out transfer switch connections and operations and place in service.

3.04 ADJUSTING

- A. Adjust control and sensing devices to achieve specified sequence of operation.

3.05 DEMONSTRATION AND TRAINING

- A. Demonstrate operation of transfer switch in normal and emergency modes.

END OF SECTION

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SECTION 16620: STANDBY ENGINE GENERATORS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section describes materials, installation, testing, and delivery of the diesel engine generator set and associated equipment to be used for standby power in the event of a utility power failure.
- B. The manufacturer shall provide supervision and verification of the installation and shall be present at the testing and start-up procedures as indicated herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE (NOT USED)

- A. Section 09900 - Painting and Coating.
- B. Section 16000 - General Electrical Requirements.
- C. Section 16446 - Automatic Transfer Switch

1.03 STANDARDS

Construct equipment in accordance with the applicable requirements of the following standards and regulations:

- A. National Electrical Code (NEC).
- B. American National Standards Institute (ANSI).
- C. National Electrical Manufacturers Association (NEMA).
- D. Institute of Electrical and Electronic Engineers (IEEE).
- E. Insulated Cable Engineers Association (ICEA).
- F. American Society for Testing and Materials (ASTM).
- G. Underwriters' Laboratories, Inc. (UL).
- H. South Coast Air Quality Management District (SCAQMD) Rule 1470 – "Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines."

1.04 SUBMITTALS

- A. Submit shop drawings in accordance with the General Conditions.
- B. Submit shop drawings and catalog data for the following equipment. Show applicable ratings, sizes, materials, manufacturers and part numbers, and overall dimensions and weights.
 - 1. Itemized bill of material.

2. Engine-generator base with anchor bolt sizes and layout. Submit anchor bolt material listing. Submit catalog data for vibration isolators and calculations for size and number of anchor bolts. Calculations shall be signed and stamped by a California-registered structural engineer or civil engineer.
 3. Engine.
 4. Generator.
 5. Silencer
 6. Base mounted fuel tank.
 7. Control panel.
 8. Battery charger.
 9. Batteries.
 10. Jacket water heater.
 11. Sound attenuated enclosure.
 12. Generator sizing calculation to include the voltage dip under the condition stated in paragraph 2.02A of this specification.
 13. Vibration isolators.
 14. Alternator temperature rise.
 15. Fuel level transmitter
 16. Platforms (if required by codes or standards)
- C. Submit system schematic diagram showing all piping and wiring interconnections with sizes and quantities. Submit ladder-type schematic electrical diagrams with legend identifying all devices on diagrams.
- D. Submit installation fact sheet giving fuel, coolant, lubricating oil, and exhaust and ventilation requirements.
- E. Submit torsional vibration analysis.
- F. Submit factory test report.
- G. Submit a start-up inspection report signed by the engine manufacturer's authorized field service representative.
- H. Obtain construction and operating permits from the local Air Quality Management District on behalf of the Owner. Submit copy of application and original of permits to the Owner.

- I. Provide an information copy of the standard engine inspection and maintenance service contract. The contract shall be for the complete system including all auxiliary support systems.

1.05 OWNER'S MANUAL

The following shall be included in the Owner's Manual:

- A. One set of operation, maintenance, and parts manuals shall be supplied with the generator set. The manuals shall cover all components, options, and accessories supplied.
- B. Copies of all factory engine tests, in quintuplicate, certified by an officer of the manufacturing corporation.
- C. Copies of generator test documentation, in quintuplicate, certified as above.
- D. Point-to-point wiring diagrams for all controls
- E. Details of starting systems, including electrical schematics.

1.06 MANUFACTURER'S SERVICES

- A. Provide equipment manufacturer's services at the jobsite for the minimum man-days listed below, travel time excluded:
 1. Two man-days to check the installation and advise during start-up, testing, and adjustment of the equipment and to instruct the Owner's personnel in the operation and maintenance of the equipment.
 2. Submit operation and maintenance manuals prior to this instruction.
- B. Written certification, in a form approved by the Owner, shall be provided by the equipment manufacturer or his authorized representative. This certification shall verify:
 1. That the equipment and its installation has been inspected on the job by the manufacturer and that the equipment is in first-class condition throughout, has been installed in accordance with the manufacturer's requirements and recommendations, and that the installation is approved by the manufacturer.
 2. That the equipment is operating in a safe and satisfactory manner and is delivering capacities and performance not less than the capacities and performance specified herein.

1.07 TOOLS AND ACCESSORIES

- A. Furnish and deliver all special tools, instruments, accessories, and special lifting and handling devices shown in the approved instruction manuals. Unless otherwise specified or directed by the Owner, the items shall be delivered to the Owner, with the manufacturer's written transmittal accompanying each shipment, in the manufacturers' original containers labeled to describe the contents and the

equipment for which it is furnished. The manufacturer shall deliver a copy of each transmittal to the Owner for record purposes.

1.08 WARRANTY

- A. Equipment furnished under this section shall be guaranteed against defective parts or workmanship for a period of 24 months from date of field testing and acceptance by the Owner.

1.09 MEASUREMENT AND PAYMENT

- A. Payment for the work in this section shall be included as part of the lump-sum bid amount stated in the Proposal.

1.10 AIR QUALITY REQUIREMENTS

- A. The generator system provided shall meet all requirements of the local and state air quality regulatory agencies. The manufacturer shall provide all emissions data and shall process and obtain the permit to install the units.

PART 2 - MATERIALS

2.01 MANUFACTURERS

- A. The engine-generator shall be manufactured by Caterpillar Inc. Engine Division, Cummins-Onan, Generac, Kohler or equal.

2.02 RATING

- A. The rating of the standby engine-generator shall be as listed below as a minimum and based on operation of the set when equipped with all operating accessories, such as air cleaners, lubricating oil pump, fuel injection pump, radiator fan, and jacket water pump. The units shall meet all AQMD emission requirements. The specified standby KW shall be for continuous electrical service during interruption of the normal utility source.

1. Standby KW: 350 (minimum).
2. Engine Speed: 1,800 rpm (maximum).
3. Voltage: 480/277 volts, 3 phase, 4 wire.
4. Frequency: 60 hertz.
5. Power Factor: 0.8.
6. Altitude: 300 feet above sea level.
7. Ambient Air Temperature: 95°F maximum, 30°F minimum.
8. Humidity at Maximum Temperature: 69 percent.

9. The momentary rms voltage dip shall not be greater than 30 percent of rated voltage when full load at rated power factor is applied to the generator.
10. Maximum allowable frequency dip: 30 percent.
11. Alternator Temperature rise rating 130 degrees C.

2.03 ENGINE

A. General: The engine shall be the standard product of the manufacturer, a current production model, and have the following features:

1. Full compression ignition diesel.
2. Four-stroke cycle.
3. Water cooled.
4. Replaceable cylinder liners.
5. Replaceable valve seat inserts.
6. Turbocharged, aftercooled, retarded 4 degrees.
7. With aftercooler.
8. Capable of the rated output when operating on commercially available No. 2-D diesel fuel (ASTM D 975).

B. Provide the engine with the following accessories:

1. Fuel, lube oil, and intake air filters.
2. Intake air silencer, high frequency type or combination intake filter/silencer.
3. Lube oil cooler.
4. Fuel transfer pump with suction lift as required.
5. Flexible fuel lines.
6. Engine-mounted water pump.
7. Coolant and oil drain valves.

C. Starting System:

1. Provide a DC electric starting system with positive engagement drive. Minimum voltage shall be 24 volts.
2. Provide lead-acid storage batteries of the heavy-duty diesel-starting type. The batteries shall have sufficient capacity to provide for 1-1/2-minute

total cranking time without recharging and shall be 20-hour rated no less than 200 amp-hours at 24 volts. Provide a freestanding corrosion-resistant fiberglass battery box. Provide battery cables and replaceable connectors.

3. Provide a UL-listed, two rate, current-limiting battery charger to automatically recharge batteries. Charger shall float at 2.17 volts per cell and equalize at 2.33 volts per cell. It shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressors, DC ammeter, and fused AC input. AC input voltage shall be 120 volts. Amperage output shall be no less than 10 amperes for units smaller than 500 kw and 20 for units larger than 500 kw. Charger output shall be at least 25 percent greater than the auxiliary equipment power demand.

D. Governing System:

1. Provide an adjustable isochronous governor of the electrical-hydraulic or all electric type with electrical speed sensing. Governor shall provide adjustable speed setting from 58- to 62-hertz adjustable speed regulation, adjustable load limit from 100 percent to 110 percent of unit rating, and shall also control the engine at recommended idle speed. The governor shall be capable of maintaining the frequency constant within ± 0.25 percent for any constant load from no load to full generator rating. After a sudden load change of 25 percent of rated load, the governor shall reestablish stable operating conditions in not less than 1-1/2 seconds. Stable operation is defined as operation at a frequency that is constant within ± 0.25 percent of rated frequency. The maximum change of frequency during the 1-1/2 second surging period shall not exceed 1.5 hertz.
2. Install the electronic control portion of the governor in the generator control panel. Governor shall be Woodward 2301, Barber Colman DYN1-10004, or equal.

E. Lubrication System:

1. Fix a pressure-type lubricating system with gear-type oil pump and full flow oil filter to the engine. Filters shall be threaded spin-on type, conveniently located for servicing. Provide filters with a spring-loaded bypass valve to ensure oil circulation if filters are clogged.
2. Provide an oil drain with readily accessible manual valve with piping extended for easy access and proper capture of waste oil.

F. Engine-Mounted Fuel System:

1. Provide an engine-mounted fuel filter with spin-on type replaceable elements, fuel pressure gauge, accessible manual shutoff valve, and engine-driven positive displacement pump.
2. Provide a water separator on the engine just ahead of the fuel filters to prevent condensation, or other water, present in the fuel from reaching

the engine filters, pumps, or injectors. Construct of heat-resistant Lexan, with an aluminum-perforated baffle, for easy viewing of the amount of water contained.

- G. Jacket Water Heater: Provide a UL-listed, unit-mounted thermal circulation-type water heater incorporating a self-contained thermostatic switch, controlled by the exit coolant temperature from the heater to maintain engine jacket coolant to 90°F in an ambient temperature of 30°F. The heater unit shall be single phase, 60 hertz, 240 volts, 3.0 kw. Heater shall be Chromalox or equal. Provide hand valves in the heater hoses to facilitate changing heating elements without draining the entire cooling system.
- H. Safety Switches: Provide devices for indication and control of the following conditions at the generator control panel.
 - 1. Low oil pressure (pre-alarm).
 - 2. Low oil pressure (shutdown).
 - 3. High water temperature (prealarm).
 - 4. High water temperature (shutdown).
 - 5. Overspeed (shutdown).Overspeed trip and cranking termination shall be by a dual element electronic-type speed switch that operates on magnetic impulses from the flywheel ring gear or other engine-timed gear. Overspeed trip setting shall be 118 percent of synchronous speed. The low setting shall be used to automatically ensure continued engine cranking until the engine has reached 600 rpm, even if the oil pressure is up to an acceptable level at a lower speed.
- I. Emissions: Provide the engine with emission control equipment to ensure that gaseous exhaust emissions (for NOx, HC, and CO) do not exceed the maximum levels established by the local Air Quality Management District. These maximum levels shall be at the manufacturer's rated speed and load as measured by SAE-J177 and SAE-J215 recommended practices. Verification of the ability to meet these emission specifications shall be submitted.

2.04 GENERATOR

A. General:

- 1. The generator shall be a 3-phase, 60-hertz, single-bearing, drip proof, rotating field, synchronous type, with 3-phase rotating armature brushless exciter. Provide Class F insulation on the stator and rotor. Further protect both with 100 percent epoxy varnish impregnation and an overcoat of resilient epoxy asphalt insulating material to increase resistance to abrasive dust or sand, high humidity, and light acidic, oil, or salt-laden atmospheres, as well as prevent fungus growth.
- 2. The wave form deviation factor of the line-to-line voltage at no load and balanced rated load at 0.80 power factor shall not exceed 5 percent. The

rms of all harmonics shall be less than 3 percent and that of any one harmonic less than 2 percent at full rated load.

3. Conform to the applicable NEMA standards for motors and generators, MG-1. Base rating of generator on continuous operation at 0.80 power factor.
- B. Regulator: The voltage regulator shall be a solid-state, volts per hertz type with 3-phase sensing and shall maintain a constant and stable generator output voltage within ± 1 percent of nominal for all steady-state loads from no load to full load with isochronous speed control and ± 2 percent with speed droop operation. A 5 percent variation in frequency and the effects of field heating shall not affect the unit's regulation performance. Provide stability and voltage range adjustments.

2.05 STRUCTURAL STEEL BASE

- A. Mount the engine-generator on a heavy-duty structural steel base. Provide holes for mounting bolts. Provide the structural steel base with means for lifting the unit for shipment and installation. Clearly identify lift points and total weight and permanently mark on the base.
- B. Anchor the steel base to the foundation with an anchorage system designed to withstand seismic forces per the California Code of Regulations, Title 24, Part 2, Section 2312, Seismic Zone 4, with $Z = 0.4$, $C_p = 0.67$, and $I_p = 1.5$. The manufacturer shall submit calculations stamped and signed by a California-registered structural engineer or civil engineer.
- C. Isolate the engine-generator from the structural steel base with rubber-in-shear isolators for units 225 kw and smaller. Isolate the engine-generator from the structural steel base with steel spring isolators for units 230 kw and larger.
- D. The Contractor shall install vibration isolators between the unit base and the concrete foundation that are per the Plans and spring-type isolators with neoprene-jacketed precompressed molded fiberglass noise isolation pads, steel load plate, built-in leveling bolt, welded steel or cast housing, and high deflection steel springs. Isolators shall be Peabody Noise Control, Inc.; Kinetics brand, Type SM; or equal.

2.06 COOLING SYSTEM

- A. Provide an engine-mounted radiator with blower-type fan sized to maintain full load operation continuously at the specified maximum ambient temperature. Equip the radiator with a 1-inch-wide duct adapter flange and low coolant level switch gauge. The radiator shall be able to produce the airflow required for proper cooling of the engine at full rated load with up to 1.0 inch of water resistance. Provide ductwork with flexible connection section between radiator duct flange and exhaust louver. Provide fan guard for protection of maintenance personnel as required by Cal/OSHA.
- B. Ductwork shall be galvanized iron or steel sheets. Anchor ducts securely to the building and install so as to be completely free from vibration during engine

operation. Brace and reinforce ducts with angles or other structural members. Internal ends of slip joints shall be installed in the direction of flow.

- C. Flexible connection shall be wire-reinforced glass fabric. The connection shall be rendered practically airtight.
- D. Fill the engine-cooling system with distilled water and a solution of 30 percent by volume ethylene glycol for freeze protection and 5 percent by volume of a borate-nitrite solution (NALCO 2000 or equal) to prevent rust and corrosion.
- E. Provide a coolant drain with readily accessible manual valve with piping extended for easy access and proper capture of waste coolant.

2.07 EXHAUST SYSTEM

- A. Exhaust system shall consist of a silencer, flexible exhaust fitting, exhaust piping, insulation, and mounting hardware.
- B. Provide a chamber-type supercritical hospital grade silencer constructed of Type 304 stainless steel with a baked on silicon-based coating rated for 1100°F minimum. Silencer shall provide an average noise attenuation of 33 to 40 dBA. Provide brackets, companion flanges, gaskets, and fasteners for mounting silencer. Silencer shall be as manufactured by Universal, Nelson, Riley-Beaird, or equal.
- C. Silencer and exhaust pipe size shall be sufficient to ensure that measured exhaust back pressure does not exceed the maximum limitations specified by the generator set manufacturer.
- D. Provide a seamless Type 316 stainless steel bellows-type flexible exhaust fitting at least 18-inches long.
- E. Exhaust piping shall be carbon steel. Provide flanged or welded type fittings. Provide sufficient flanged fittings to permit the system to be entirely dismantled in sections. Use sweep elbows with a radius at least three times the pipe diameter.
- F. Provide vertical discharge tailpipe. Cap with a counterbalanced raincap.
- G. Cover the exhaust manifolds with an expanded metal guard for personnel protection.
- H. Cover the silencer and interior exhaust piping with lagging to maintain a surface temperature not to exceed 150°F. Lagging shall be calcium silicate insulation with banded aluminum jacket.

2.08 DIESEL PARTICULATE FILTER (NOT USED)

- A. Provide an active regeneration type diesel particulate filter system with all necessary appurtenances, including but not limited to the particulate filter, filter controller, and electric heater, such that the generator emissions levels meet Air Quality Management District (AQMD) requirements.

2.09 FUEL STORAGE SYSTEM

- A. Provide a sub-base fuel tank for the generator set, sized to allow full load operation of the generator for 72 hours. The fuel tank shall be UL 142 listed and labeled.
- B. The fuel tank shall be double walled, steel construction and include the following features:
 - 1. Emergency tank and basin vents.
 - 2. Mechanical level gauge.
 - 3. Fuel supply and return lines, connected to the generator set with flexible fuel lines as recommended by the engine manufacturer and in compliance with UL 2200 and NFPA 37 requirements.
 - 4. Leak detection provisions, wired to the generator set control for local and remote alarm indication.
 - 5. High and low fuel level float switches to indicate fuel level. Wire switches to generator control for local and remote indication of fuel level.
 - 6. Fuel level transmitter: Provide an ultrasonic level transmitter capable of continuous fuel level measurement with a 4-20mA output signal as shown on the Drawings. Level transmitter shall be as manufactured by Flowline, or approved equal.
 - 7. Minimum 5-gallon capacity spill container at fuel fill point.
 - 8. Basin drain.
 - 9. Integral lifting provisions.

2.10 GENERATOR CONTROL PANEL

- A. Provide a NEMA 1, vibration isolated, dead front, 16-gauge steel control panel with lockable hinged cover. Mount and wire the control panel to the engine-generator set. The panel shall include the following equipment:
 - 1. Voltmeter, 3-1/2 inches, 2 percent accuracy with 3-phase fuse protection. Digital meters are acceptable.
 - 2. Ammeter, 3-1/2 inches, 2 percent accuracy. Digital meters are acceptable.
 - 3. Ammeter-voltmeter phase selector switch. Digital meters are acceptable.
 - 4. Frequency meter, 3-1/2 inches, dial type. Digital meters are acceptable.
 - 5. Kilowatt meter.
 - 6. Oil pressure gauge.

7. Water temperature gauge.
8. Oil temperature gauge.
9. Running time meter.
10. Instrument transformers.
11. Automatic starting controls.
12. Voltage level adjustment rheostat.
13. Dry contacts for remote alarms wired to terminal strips from the following alarms:
 - a. Fault indicator lights with press to test feature for low oil pressure.
 - b. High coolant temperature.
 - c. Low coolant level.
 - d. Overspeed.
 - e. Overcrank.
 - f. Run dry contact.
 - g. Generator common fail.
 - h. In auto.
 - i. Breaker position (not closed).
14. Visual alarm indicators for impending shutdown from low oil pressure and high coolant temperature.
15. 80-dB alarm horn with silence switch.
16. Three-position function switch marked "manual," "off/reset," and "auto."
17. Panel illumination lights and switch.
18. Electric governor control unit.
19. Generator voltage regulator as previously specified.
20. Low battery voltage alarm light.
21. 4 to 20mA signal outputs for oil pressure, coolant temperature, and battery voltage.
22. Emergency stop button on control panel and an additional emergency stop button on the side of the engine-generator mounted approximately 48 inches above finished floor.

- B. Meters, circuit breakers, control switches, and current transformers shall be General Electric, Cutler-Hammer, or equal. Pilot lights and push buttons shall be oiltight type. An annunciator panel may be provided in lieu of oiltight pilot lights. Digital instrumentation is acceptable in lieu of meters and lamps.
- C. Provide relays and timing devices with clear polycarbonate dust covers. Devices shall be plug-in type with holddown spring retainers. Output contacts shall be rated 10 amperes at 24-volts DC.
- D. Provide engraved or etched nameplates to show position of switches and function of pilot lights, push buttons, and meters. Do not provide embossed tape.
- E. Provide fully automatic generator set start-stop controls in the generator panel. Controls shall operate as follows:
 - 1. When the function switch is in automatic position and upon closure of a set of external contacts or when the switch is in manual position, the engine shall automatically crank. An adjustable cranking limiter shall allow from 2 to 5 cycles of 10 seconds' crank followed by 10 seconds' rest. If the engine fails to start after this time, the starting circuit shall be locked out and the overcrank shutdown light initiated.
 - 2. When operating in the automatic mode and the remote engine run contact opens, the engine shall shut down.
 - 3. Initiation of any safety shutdown shall immediately stop the engine and light the appropriate light. Upon correction of the fault, the shutoff system shall be made operable by moving the function switch to off/reset and then back to the "auto" position.

2.11 MAIN LINE CIRCUIT BREAKER

- A. Provide a main line molded case circuit breaker sized in accordance with the NEC. Install on the generator in a NEMA 3R enclosure or in the generator control panel to function as a load circuit interrupting and protection device. It shall operate both manually for normal switching function and automatically during overload and short-circuit conditions. Circuit breaker shall trip free of the handle. The handle position, or a luminescent flag, shall indicate "off," "on," or "tripped" breaker positions. The trip unit for each pole shall have elements providing inverse time delay during overload conditions and instantaneous magnetic tripping for short-circuit protection. Insulated neutral terminals and a ground terminal shall be provided and marked. The circuit breaker shall meet standards established by UL, NEMA, and NEC. Do not use generator exciter field circuit breakers in lieu of a main line circuit breaker.
- B. Circuit breaker shall be equipped with an auxiliary contact to provide "Generator Circuit Breaker Not Closed" input to the PLC.
- C. Generator circuit breaker shall be equipped with shunt trip device.
- D. If output circuit breaker(s) and/or generator controls are located more than 6'-6" above the finished grade and/or are not readily accessible and with clearance as

required by the NEC, provide all necessary work and materials including but not limited to ramps, stairs, and platforms required to achieve compliance with the conditions above. All provisions shall conform to OSHA, state and local safety requirements including but not limited to handrails, markings, signage, and access barriers.

2.12 TORSIONAL VIBRATION ANALYSIS

- A. Submit a torsional vibration analysis of the engine-generator combination, showing it free of harmful torsional vibration stresses within ± 10 percent of its normal operating speed range, the natural frequency, critical speeds, relative amplitudes of angular displacement, and approximate nodal locations of the complete elastic system of the engine and driven equipment.

2.13 SOUND ATTENUATING ENCLOSURE

- A. Provide weatherproof (NEMA 3R) Level II, Stage 2 sound attenuating enclosure that allows the generator set to operate at full rated load in an ambient temperature of up to 100°F. Enclosure shall be 14-gauge steel construction with corrosion resistant hardware and hinged, lockable doors. Enclosure shall include internally mounted muffler, sound insulating panels and rodent barriers. Insulation shall be non-hydroscopic material. All electrical and fuel stub-ups shall be within enclosure. Enclosure shall comply with all applicable NEC and UL 2200 requirements.
- B. The sound enclosure shall produce sound pressure levels at the indicated measured distances from the enclosure not to exceed those listed below.

Sound Pressure Levels (dBA) at...		
1 m (3.3 ft)	7 m (23 ft)	15 m (50 ft)
89.1	76.1	70.1

PART 3 - EXECUTION

3.01 FACTORY TESTING

- A. Perform factory tests in the presence of the Owner's Representative prior to shipment. Provide 7-days' advance notice of test date. Include the following tests.
- B. Demonstrate proper operation of all safety devices, shutdown features, and alarms. Conduct load tests utilizing resistive load banks as follows:

Load	Hours
1/2	1
3/4	1
Full	4

- C. Record current, voltage, frequency, water temperature, and lube oil pressure every 15 minutes.
- D. Verify fuel consumption rate at 1/2, 3/4, and full loads. Note fuel consumption rates on a label located at fueling point.
- E. The manufacturer shall pay reasonable food, transportation and lodging expenses for up to three Owner personnel to witness testing.

3.02 INSTALLATION (APPLICABLE DURING CONSTRUCTION PHASE)

- A. Installation will be done by the installation contractor. The manufacturer shall provide written installation instructions with shop drawings. The manufacturer shall coordinate with the installation contractor regarding installation of the engine-generator set foundations and fuel and piping systems and shall verify that all components specified herein are installed in accordance with the generator set manufacturer's written requirements. Foundation blocks, anchor bolt layouts, and piping may have to be modified from those shown on the Plans. Such work shall be at the Contractor's expense.
- B. Anchor bolts for the engine-generator set bases shall be cast-in-place. The engine manufacturer shall provide anchor bolts and select anchor bolt material.
- C. Fill the tanks with No. 2-D diesel fuel meeting ASTM D 975-60T. After field testing is complete, refill the tanks.

3.03 PIPING (APPLICABLE DURING CONSTRUCTION PHASE)

- A. Pitch horizontal runs of exhaust pipe away from the engine. Provide condensate traps with petcocks or valves at low spots in the exhaust system.

3.04 PAINTING AND COATING

- A. Coat non-insulated exhaust pipes and silencers with a baked silicon-based coating rated for 1100°F minimum.

3.05 START-UP

- A. On completion of the installation, the initial start-up shall be performed by a factory-trained service representative of the engine supplier, who shall thoroughly inspect, operate, test, and adjust the equipment. The inspection shall include the soundness of all parts, completeness of all details, proper operation of all components with special emphasis on safety devices, correctness of the settings, proper alignments, and correct phase rotation to match other sources.
- B. Field tests shall include the following:
 - 1. Simulate power failure by tripping the main breaker and demonstrate complete manual and automatic start, load, unload, and stop sequence of the engine-generator.

2. Conduct a 2-hour run, utilizing maximum available load. If available load is less than 75 percent of the generators' rating, provide load bank loads to obtain 75 percent generator loading (minimum).
3. Retest all alarms and shutdown features.

3.06 SCHEDULED OIL SAMPLING

- A. In order to forecast and minimize engine failure, the supplier of the equipment shall provide a quarterly (every 3 months) oil sampling analysis for a period of 2 years from date of acceptance. This scheduled oil sampling shall be of the atomic absorption spectrophotometry method as opposed to the spectographic analysis method and shall be accurate to within ± 1 ppm for the following elements: lead, iron, chromium, copper, aluminum, and silicon. In addition, test the sample for the presence of water, fuel, dilution, and antifreeze.
- B. Provide equipment needed to take oil samples in a kit at the time of acceptance. Include a sample gun kit, bottles, mailers, and written instructions.
- C. Provide immediate notification by telephone or fax to the Owner when analysis results show any critical reading. If readings are normal, provide a report by mail showing that the oil quality is within established requirements.
- D. This scheduled oil sampling program shall be available to the Owner at the supplier's normal rate, after the mandatory 2 years, and shall be continued thereafter at the Owner's option.

3.07 DELIVERY, STORAGE AND HANDLING

- A. The manufacturer shall deliver the assembly to the field just prior to installation as determined by the installation contractor and as approved in writing by the Owner.
- B. The manufacturer shall store the assembly within a building protected from the elements for a period up to 365 calendar days.
- C. The installation contractor shall accept the delivery of the assembly and will take responsibility for them from that point on and will coordinate with the manufacturer to ensure proper installation of the system. The manufacturer shall coordinate with the installation contractor as needed to provide a complete and functional installation that is covered by the manufacturer's warranty.

3.08 TRAINING

- A. The manufacturer shall provide hands-on training to the City technicians as needed to perform generator maintenance, tune-ups, testing, and diagnostics.

END OF SECTION

Form C

**EXCEPTIONS TO PROPOSAL TERMS, CONDITIONS,
AND SOLUTIONS REQUEST**



Company Name: Caterpillar Inc.

Any exceptions to the terms, conditions, specifications, or proposal forms contained in this RFP must be noted in writing and included with the Proposer's response. The Proposer acknowledges that the exceptions listed may or may not be accepted by NJPA or included in the final contract. NJPA will make reasonable efforts to accommodate the listed exceptions and may clarify the exceptions in the appropriate section below.

Section/page	Term, Condition, or Specification	Exception	NJPA ACCEPTS
5.11 / Page 24	Vendor's certificate(s) must include all subcontractors as additional insureds under its policies.	Caterpillar Dealer's cannot be named as additional insured on this certificate.	NJPA Accepts
1.16 / Page 22-23	The Vendor must disclose to NJPA any litigation, bankruptcy, or suspension/forfeitures that occur during the Contract period.	As a large international enterprise, Caterpillar Inc. can manage numerous litigation and other proceedings all over the globe for itself and for its subsidiaries and its affiliates. Caterpillar Inc. agrees to provide the information requested in 7.16 for activities that directly impact Caterpillar Inc.'s performance obligations under the RFP contract.	NJPA Accepts
1.17 / Page 28	Prevailing wage: The Vendor must comply with applicable prevailing wage legislation in effect in the jurisdiction of the RFP's location.	Caterpillar Inc. will use its subcontractors, who are independent, owned and operated Dealers, to provide services to NJPA members. Caterpillar Dealer's will comply with the applicable prevailing wage legislation required for the services provided to NJPA members in their jurisdiction.	NJPA Accepts

Proposer's Signature: [Signature]

Date: 11/21/2017

NJPA's clarification on exceptions listed above:

Review and Approved:
[Signature] 4/23/18
 NJPA Legal Department

Contract Award
RFP #120617


FORM D



Formal Offering of Proposal
(To be completed only by the Proposer)

ELECTRICAL ENERGY POWER GENERATION WITH RELATED PARTS, SUPPLIES, AND SERVICES

In compliance with the Request for Proposal (RFP) for **ELECTRICAL ENERGY POWER GENERATION WITH RELATED PARTS, SUPPLIES, AND SERVICES**, the undersigned warrants that the Proposer has examined this RFP and, being familiar with all of the instructions, terms and conditions, general and technical specifications, sales and service expectations, and any special terms, agrees to furnish the defined products and related services in full compliance with all terms and conditions of this RFP, any applicable amendments of this RFP, and all Proposer's response documentation. The Proposer further understands that it accepts the full responsibility as the sole source of solutions proposed in this RFP response and that the Proposer accepts responsibility for any subcontractors used to fulfill this proposal.

Company Name: Caterpillar Inc. Date: November 21, 2017
Company Address: 100 NE Adams Street
City: Peoria State: IL Zip: 61629
Contact Person: Seth Charna Title: Industry Representative
Authorized Signature: Bart Myers  (Name printed or typed)

FORM E
CONTRACT ACCEPTANCE AND AWARD



(Top portion of this form will be completed by NJPA if the vendor is awarded a contract. The vendor should complete the vendor authorized signatures as part of the RFP response.)

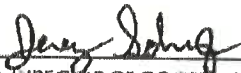
NJPA Contract #: 120617-CAT

Proposer's full legal name: Caterpillar Inc.

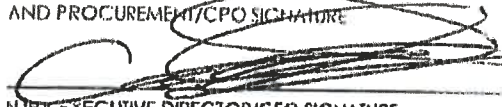
Based on NJPA's evaluation of your proposal, you have been awarded a contract. As an awarded vendor, you agree to provide the products and services contained in your proposal and to meet all of the terms and conditions set forth in this RFP, in any amendments to this RFP, and in any exceptions that are accepted by NJPA.

The effective date of the Contract will be January 29, 2018 and will expire on January 29, 2022 (no later than the later of four years from the expiration date of the currently awarded contract or four years from the date that the NJPA Chief Procurement Officer awards the Contract). This Contract may be extended for a fifth year at NJPA's discretion.

NJPA Authorized Signatures:



NJPA DIRECTOR OF COOPERATIVE CONTRACTS
AND PROCUREMENT/CPO SIGNATURE



NJPA EXECUTIVE DIRECTOR/CEO SIGNATURE

Jeremy Schwartz
(NAME PRINTED OR TYPED)

Chad Coauette
(NAME PRINTED OR TYPED)

Awarded on January 25, 2018

NJPA Contract # 120617-CAT

Vendor Authorized Signatures:

The Vendor hereby accepts this Contract award, including all accepted exceptions and amendments.

Vendor Name Caterpillar Inc.

Authorized Signatory's Title General Manager - IPSD Power Generation



VENDOR AUTHORIZED SIGNATURE

Bart Myers
(NAME PRINTED OR TYPED)

Executed on January 26, 2018

NJPA Contract # 120617-CAT

PROPOSER ASSURANCE OF COMPLIANCE



Proposal Affidavit Signature Page

PROPOSER'S AFFIDAVIT

The undersigned, authorized representative of the entity submitting the foregoing proposal (the "Proposer"), swears that the following statements are true to the best of his or her knowledge.

1. The Proposer is submitting its proposal under its true and correct name, the Proposer has been properly originated and legally exists in good standing in its state of residence, the Proposer possesses, or will possess before delivering any products and related services, all applicable licenses necessary for such delivery to NJPA members agencies. The undersigned affirms that he or she is authorized to act on behalf of, and to legally bind the Proposer to the terms in this Contract.
2. The Proposer, or any person representing the Proposer, has not directly or indirectly entered into any agreement or arrangement with any other vendor or supplier, any official or employee of NJPA, or any person, firm, or corporation under contract with NJPA, in an effort to influence the pricing, terms, or conditions relating to this RFP in any way that adversely affects the free and open competition for a Contract award under this RFP.
3. The Proposer has examined and understands the terms, conditions, scope, contract opportunity, specifications request, and other documents in this solicitation and affirms that any and all exceptions have been noted in writing and have been included with the Proposer's RFP response.
4. The Proposer will, if awarded a Contract, provide to NJPA Members the /products and services in accordance with the terms, conditions, and scope of this RFP, with the Proposer-offered specifications, and with the other documents in this solicitation.
5. The Proposer agrees to deliver products and services through valid contracts, purchase orders, or means that are acceptable to NJPA Members. Unless otherwise agreed to, the Proposer must provide only new and first-quality products and related services to NJPA Members under an awarded Contract.
6. The Proposer will comply with all applicable provisions of federal, state, and local laws, regulations, rules, and orders.
7. The Proposer understands that NJPA will reject RFP proposals that are marked "confidential" (or "nonpublic," etc.), either substantially or in their entirety. Under Minnesota Statute §13.591, Subd. 4, all proposals are considered nonpublic data until the evaluation is complete and a Contract is awarded. At that point, proposals generally become public data. Minnesota Statute §13.37 permits only certain narrowly defined data to be considered a "trade secret," and thus nonpublic data under Minnesota's Data Practices Act.
8. The Proposer understands that it is the Proposer's duty to protect information that it considers nonpublic, and it agrees to defend and indemnify NJPA for reasonable measures that NJPA takes to uphold such a data designation.

[The rest of this page has been left intentionally blank. Signature page below]

By signing below, Proposer is acknowledging that he or she has read, understands, and agrees to comply with the terms and conditions specified above.

Company Name: Caterpillar Inc.

Address: 100 NE Adams Street

City/State/Zip: Peoria, IL 61629

Telephone Number: (309) 675-1000

E-mail Address: Contact Seth Charna: Charna_Seth@cat.com

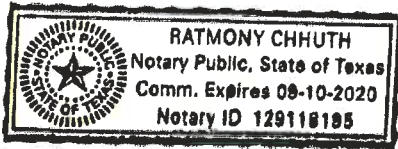
Authorized Signature: *Bart Myers*

Authorized Name (printed): Bart Myers

Title: General Manager - IPSD Power Generation

Date: November 21, 2017

Notarized



Subscribed and sworn to before me this 21 day of November, 20 17

Notary Public in and for the County of Harris State of Texas

My commission expires: 9/10/2020

Signature: *Ratmony Chhuth*



PROPOSER QUESTIONNAIRE
Payment Terms, Warranty, Products and Services, Pricing and Delivery, and Industry-Specific Questions

Proposer Name: _____ Caterpillar Inc. _____

Questionnaire completed by: _____ Seth Charna _____

Payment Terms and Financing Options

- 1) **What are your payment terms (e.g., net 10, net 30)?**
Payment terms that Caterpillar Dealers would offer to NJPA Members vary by dealer, but are most certainly equivalent to local competition. Payment terms will be made very clear to potential NJPA customers upon quotation.
- 2) **Do you provide leasing or financing options, especially those options that schools and governmental entities may need to use in order to make certain acquisitions?**
Caterpillar Financial offers financial tools for NJPA Members through the Caterpillar Dealer Network on a case by case basis. Leasing terms that Caterpillar Dealers would offer to NJPA Members vary by dealers, but are most certainly equivalent to local competition. Leasing terms will be made very clear to potential NJPA customers upon quotation.
- 3) **Briefly describe your proposed order process. Please include enough detail to support your ability to report quarterly sales to NJPA. For example, indicate whether your dealer network is included in your response and whether each dealer (or some other entity) will process the NJPA Members' purchase orders.**
The order process will not change compared to the current NJPA contract. The NJPA Member references the NJPA contract number on the P.O., which is then presented directly to their local Caterpillar Dealer.
- 4) **Do you accept the P-card procurement and payment process? If so, is there any additional cost to NJPA Members for using this process?**
Not Applicable.

Warranty

5) Describe in detail your manufacturer warranty program, including conditions and requirements to qualify, claims procedure, and overall structure. You may include in your response a copy of your warranties, but at a minimum please also answer the following questions.

- Do your warranties cover all products, parts, and labor?
- Do your warranties impose usage restrictions or other limitations that adversely affect coverage?
- Do your warranties cover the expense of technicians' travel time and mileage to perform warranty repairs?
- Are there any geographic regions of the United States for which you cannot provide a certified technician to perform warranty repairs? How will NJPA Members in these regions be provided service for warranty repair?
- Will you cover warranty service for items made by other manufacturers that are part of your proposal, or are these warranties issues typically passed on to the original equipment manufacturer?
- What are your proposed exchange and return programs and policies?

Please reference the following attachments in response to these questions specifically for the Power Generation products listed in this proposal. There are no geographic regions of the United States or Canada for which Caterpillar cannot provide a certified technician to preform warranty repairs.

Additionally, when purchased through the NJPA contract, select products will automatically include options for Extended Service Coverage in 2018. Customized Extended Service Coverage is also available through the Caterpillar Dealer Network on a case by case basis.

See Attached: Caterpillar Standard Warranty SELF5709.pdf
See Attached: Olympian Standard Warranty LEXF3074.pdf
See Attached: 2018 ESC NJPA Announcement Letter – October 6 2017.pdf

6) Describe any service contract options for the items included in your proposal.

Service contracts that Caterpillar Dealers would offer to NJPA Members vary by dealer, but are most certainly at least equal to local competition. Service contract terms will be made very clear to potential NJPA customers upon quotation.

Pricing, Delivery, Audits, and Administrative Fee

7) Provide a general narrative description of the equipment/products and related services you are offering in your proposal.

Caterpillar is offering a full line of diesel and natural gas packaged generator sets from 40 to 4000 kW. Caterpillar is also offering our XQ Products, which is our mobile generator line including trailers. Other popular and almost necessary equipment included to enhance generator set purchases are Automatic Transfer Switches, Switchgear, EPIC paralleling gear, and Microgrid components all provided from Caterpillar. The Caterpillar Dealer Network can also offer custom shop work, installation, "turn-key" solutions, delivery/freight, training, custom enclosures, custom fuel tanks, custom automatic transfer switches, dealer labor, additional/custom parts, and general contracting labor. To further enhance the NJPA members' product offering, the Caterpillar Dealer Network can also offer an expansive network of used equipment along with rental agreements.

- 8) Describe your pricing model (e.g., line-item discounts or product-category discounts). Provide detailed pricing data (including standard or list pricing and the NJPA discounted price) on all of the items that you want NJPA to consider as part of your RFP response. Provide a SKU for each item in your proposal. (Keep in mind that reasonable price and product adjustments can be made during the term of an awarded Contract. See the body of the RFP and the Price and Product Change Request Form for more detail.)

Percentage Discount from Manufacturer's and Dealer's List Pricing per the included documentation along with product price lists. The discounts included are typically higher than standard discount for each product solution. There may be specific cases with specific options or attachments where the NJPA discount is not as deep as the non-NJPA offer. Caterpillar does have the ability to make additional discounts for NJPA members and non-NJPA customers on a case by case basis. For 2018 shipments, the price increase above the provided price lists is 2%. New price lists will be updated and submitted in January 2018. Please note, there are some items in the provided Caterpillar price lists that are marked as "Net" pricing that do not get discounted. These items usually include certifications (EPA, UL, IBC), standard EPA Tier 4f components, extended service coverage, and factory testing/packaging options. These items only follow the cost plus a percentage of cost pricing process that is acceptable for pricing sourced goods or services.

See Attached: Caterpillar Gen Disc List RFP December 2017.xlsx
See Attached: List of Caterpillar Price Lists by Product Family.zip

- 9) Please quantify the discount range presented in this response. For example, indicate that the pricing in your response represents is a 50% percent discount from the MSRP or your published list.

Overall pricing from published list price is discounted from 10% up to 40% with an average of 27% overall. Specific discounts apply to each diesel or natural gas platform product line. Services, used products, rental agreements, and microgrid solutions are also included at different discounting levels. For 2018 shipments, the price increase above the provided price lists is 2%. New price lists will be updated and submitted in January 2018.

See Attached: Caterpillar Gen Disc List RFP December 2017.xlsx
See Attached: List of Caterpillar Price Lists by Product Family.zip

- 10) The pricing offered in this proposal is

- a. the same as the Proposer typically offers to an individual municipality, university, or school district.
- b. the same as the Proposer typically offers to GPOs, cooperative procurement organizations, or state purchasing departments.
- c. better than the Proposer typically offers to GPOs, cooperative procurement organizations, or state purchasing departments.
- d. other than what the Proposer typically offers (please describe).

- 11) Describe any quantity or volume discounts or rebate programs that you offer.

Volume discounts or rebate programs are not offered. The best discounting has been included in this RFP response for Caterpillar solutions.

- 12) Propose a method of facilitating “sourced” products or related services, which may be referred to as “open market” items or “nonstandard options”. For example, you may supply such items “at cost” or “at cost plus a percentage,” or you may supply a quote for each such request.

There are some items in the provided Caterpillar price lists that are marked as “Net” pricing that do not get discounted. These items usually include certifications (EPA, UL, IBC), standard EPA Tier 4f components, extended service coverage, and factory testing/packaging options. These items only follow the cost plus a percentage of cost pricing process that is acceptable for pricing sourced goods or services. The percentage mark-up offered by Caterpillar Dealers to NJPA Members will vary by dealer, but is certainly equivalent to local competition. Exercising the ability to offer cost plus a percentage for “Net” items will ensure more clarity for the Caterpillar Network regarding NJPA offers because the current contract makes it difficult to calculate “Net” items since they cannot be discounted by Caterpillar. For a majority of sales including EPA Tier 2 or EPA Tier 3 platforms, the “Net” items on average are no more than 1-2.5% of the total customer list pricing. EPA Tier 4f platforms have a higher percentage of “Net” items due to the significant amount of set priced emissions components required for EPA certification.

- 13) Identify any total cost of acquisition costs that are **NOT** included in the pricing submitted with your response. This cost includes all additional charges that are not directly identified as freight or shipping charges. For example, list costs for items like installation, set up, mandatory training, or initial inspection. Identify any parties that impose such costs and their relationship to the Proposer.

All transactions will take place and be negotiated between a Caterpillar Dealer and an NJPA member. Only those generator set items specifically included in a Caterpillar List Price are subject to the NJPA administration fee. Most costs associated with acquiring a generator set and related products are included within the pricing file (Caterpillar Gen Disc List RFP December 2017.xlsx) and are subject to discount. In some cases, there may be costs involved that have not been listed. These costs associated with acquiring a generator set involve items that a manufacturer (Caterpillar) cannot competitively provide.

- 14) If delivery or shipping is an additional cost to the NJPA Member, describe in detail the complete shipping and delivery program.

These programs and policies vary with products and geographic regions. Each quote from a Caterpillar Dealer to an NJPA member will have unique shipping fees. These fees may include shipment from the Caterpillar factory and, in some cases, additional local shipping fees either to a third-party packager or to the customer when factory shipment timing doesn't align with customer requirements. Shipping fees will be handles on a case-by-case basis between the selling Caterpillar Dealer and the NJPA member.

- 15) Specifically describe those shipping and delivery programs for Alaska, Hawaii, Canada, or any offshore delivery.

Shipping and delivery programs for Alaska, Hawaii, Canada, or any offshore delivery are included in question 14. These items vary by Caterpillar Dealer due to the different geographic locations. The Caterpillar Network located in Alaska, Hawaii, Canada, or other offshore location is aware of their local shipment requirements and is knowledgeable on how to quote shipping to NJPA customers.

- 16) Describe any unique distribution and/or delivery methods or options offered in your proposal.

Caterpillar offers a factory freight program specific to certain product lines. Where applicable, this program utilizes economies of scale to ensure the best shipment cost to the local Caterpillar dealer from our factories. This portion of the freight cost to customers will pass through the Caterpillar network as it did before, but is managed by Caterpillar for the first point of delivery.

- 17) Please specifically describe any self-audit process or program that you plan to employ to verify compliance with your proposed Contract with NJPA. This process includes ensuring that NJPA Members obtain the proper pricing, that the Vendor reports all sales under the Contract each quarter, and that the Vendor remits the proper administrative fee to NJPA.

The Caterpillar Dealer Network will receive additional discounts from Caterpillar to help reach NJPA members purchasing prices per the NJPA contract. To qualify for the discounts, the selling Caterpillar Dealer must identify each applicable sale as an NJPA sale on their order and they must also send a report to the Caterpillar designated NJPA custodian, Seth Charna, including the product order number and NJPA member number. Reports are updated and reviewed on a quarterly basis to assist in providing payment to NJPA. The Caterpillar designated NJPA custodian, Seth Charna, has and will remain actively involved in the auditing process both with auditing Caterpillar Dealer pricing to NJPA members as well as the quarterly administration fee process.

- 18) Identify a proposed administrative fee that you will pay to NJPA for facilitating, managing, and promoting the NJPA Contract in the event that you are awarded a Contract. This fee is typically calculated as a percentage of Vendor's sales under the Contract or as a per-unit fee; it is not a line-item addition to the Member's cost of goods. (See RFP Section 6.29 and following for details.)

The proposed administrative fee payable to NJPA is proposed to be 1% of transaction price, in line with the previous two Caterpillar contracts, for all NJPA contract sales of generator sets. This 1% is the same percent as outlined in our current NJPA contract #080613-CAT

Should Caterpillar be exclusive, like the previous two Caterpillar contracts, this is valuable to the Caterpillar Dealer Network and Caterpillar would be willing to increase the administrator fee to 1.25% of transaction price.

Industry-Specific Questions

- 19) Please specify product and voltage range the generator equipment that you are offering.

Caterpillar offers factory voltage options for the majority of customer requirements. In general, here's a snapshot of the factory options based on the diesel product line. Voltage options may slightly differ on the natural gas product line and the full Caterpillar price list should be consulted to determine which specific ratings can be configured with the voltages listed below. There may also be a few exceptions where the Caterpillar Dealer Network can work towards custom solutions when necessary.

100 kW and Below Single Phase:	240V
750 kW and Below Three Phase:	480V, 600V, 208V, 240V
1000 kW up to 1250 kW:	480V, 600V, 208V, 240V, 400V, 380V
1500 kW up to 4000 kW:	480V, 600V, 240V, 440V, 380V, 2400V, 416V, 4160V, 6300V, 6600V, 6900V, 12470V, 13200V, 13800V

- 20) Describe your mobile or trailer mounted units, if any, and specify the ranges.

The XQ product line is included in the Caterpillar proposal. These units are offered with trailers for mobile use and for the most part they include switchable voltage options, which is preferred since they can be utilized at multiple customer locations with unique voltage requirements. The following XQ products are available and are EPA Tier 4f certified for mobile usage. We are working on a platform between the XQ125 and XQ425 that will be available/added to an awarded contract once released. The number represents the kVA rating of the generator and not the kW output.

XQ35
XQ60
XQ125
XQ425
XQ570

21) If you are providing trailers as part of a turnkey package, please provide details.

All XQ packages described in question 20 include trailers with selectable options including the ball size and brake type. These are the only factory product offerings that can be configured on trailers due to EPA emissions requirements.

It is important to note that the Caterpillar Dealer Network can also place Caterpillar genset packages on trailers when necessary as long as EPA regulations for stationary applications are met (EPA requires the generator to remain stationary for a specific period of time).

22) Describe how you will include customization and the pricing of such for the units.

The Caterpillar Dealer Network can offer custom shop work, installation, "turn-key" solutions, delivery/freight, training, custom enclosures, custom fuel tanks, custom automatic transfer switches, dealer labor, additional/custom parts, and general contracting labor. To further enhance the NJPA members' product offering, the Caterpillar Dealer Network can also offer an expansive network of used equipment along with rental agreements. Most costs associated with acquiring a generator set and related products are included within the pricing file (Caterpillar Gen Disc List RFP December 2017.xlsx) and are subject to discount. In some cases, there may be costs involved that have not been listed. These costs associated with acquiring a generator set involve items that a manufacturer (Caterpillar) cannot competitively provide.

23) Describe installation and service programs, and identify the associated services, service provider locations and pricing.

The Caterpillar Dealer Network will be the provider of all Caterpillar and non-Caterpillar components and services required to meet the NJPA members' local requirements.

24) Describe any preventative maintenance or extended service coverage agreements.

Preventative maintenance and extended service coverage/contracts agreements in addition to the standard product offering are covered in the "Caterpillar Gen Disc List RFP December 2017.xlsx" file.

25) Do you provide preventive, periodic or full maintenance plans/programs for the solutions you are proposing in this response?

- a. If so, provide a recommended service & maintenance agreement for a periodic/preventative and or full maintenance plan.
- b. What are recommended service intervals?

The Caterpillar Dealer Network will be the provider of all preventative maintenance plans / programs that are specific to the product being provided to the NJPA member. Preventative maintenance and extended service coverage/contracts agreements in addition to the standard product offering are covered in the "Caterpillar Gen Disc List RFP December 2017.xlsx" file.

26) Describe your rental agreements and pricing schedule.

Rental agreements in addition to the standard product offering are covered in the "Caterpillar Gen Disc List RFP December 2017.xlsx" file.

27) Will you include used equipment and if so, provide a pricing strategy for these units.

Used product agreements in addition to the standard product offering are covered in the "Caterpillar Gen Disc List RFP December 2017.xlsx" file.

28) Provide a general overview of your products EPA compliance.

Caterpillar offers a full range of products for use in the United States per EPA compliance guidelines. Per these guidelines, the application determines the EPA emissions level that is required for that specific product. For diesel emergency standby ratings (most of the market for <1000 kW) Caterpillar offers both EPA Tier 2 and EPA Tier 3 emissions levels and the specific emissions level is auto selected based on the EPA defined brake horsepower requirements. For non-emergency and/or mobile applications, Caterpillar has select ratings available with EPA Tier 4f factory certification. The Caterpillar Dealer Network is familiar with EPA regulations and can direct the NJPA member to the applicable product line required for their application.

29) Identify the lifecycle cost of ownership of your generator solutions.

The Caterpillar Dealer Network will be the provider of all preventative maintenance and lifecycle costs at the request of NJPA members. Due to the vast differences across geographic locations and product lines, this request will be handled on a case-by-case basis.

Signature: _____

Ben Murr

Date: _____

11/21/2017

Letter of Agreement To Extend the Contract

Between

Caterpillar Inc.
100 NE Adams Street
Peoria, IL 61629

And

Sourcewell
202 12th Street NE
Staples, MN 56479
Phone: (218) 894-1930

The Vendor and Sourcewell have entered into an Agreement (Contract #120617-CAT) for the procurement of Electrical Energy Power Generation with Related Parts, Supplies and Services. This Agreement has an expiration date of January 29, 2022, but the parties may extend the Agreement for one additional year by mutual consent.

The parties acknowledge that extending the Agreement for another year benefits the Vendor, Sourcewell and Sourcewell's members. The Vendor and Sourcewell therefore agree to extend the Agreement listed above for a fifth year. This existing Agreement will terminate on January 29, 2023. All other terms and conditions of the Agreement remain in force.

So DocuSigned by:
Jeremy Schwartz
By: C0FD2A130D06489... _____, Its: **Director of Operations & Procurement/CPO**

Name printed or typed: Jeremy Schwartz
Date 2/12/2021 | 11:57 AM CST

Cat DocuSigned by:
Jason Kaiser
By: 3E9FF774E086402... _____, Its: VP - Electric Power Division

Name printed or typed: Jason Kaiser
Date 2/13/2021 | 6:05 AM PST



QUOTATION

NO. 220300R1

3500 Shepherd Street, City of Industry, California 90601
 Box 226789, Los Angeles, California 90022-0744
 (562) 463-6000 Fax: (562) 463-7156

Date: July 22, 2022

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To: Contact: Belgin Cuhadaroglu
 Company: City of San Clemente
 Address: 910 Calle Negocio
 City, Zip: San Clemente, CA 92673
 Phone: _____ Email: _____

Terms: Net Cash, see T&C's
 F.O.B. Jobsite, unloading by others
 Sales Rep.: Pete Vainoris
 Contact #: 562-201-3428
 Email: pvainoris@quinnpower.com

Project Name: City of San Clemente – City Hall *Sourcewell*

Qty:	Description	Unit Price	Extension
1	New Caterpillar, Model C13 Diesel Standby Generator Set. Rated 350kW, w/fan, 60Hz, 3Ph, 277/480V at 1800 RPM. Includes level 2 sound enclosure, 1800 gallon (72 hour) tank and dual sided platform (ship loose, install by others). Lead time is 71-75 weeks from order	\$ 196,978.00	\$ 196,978.00
1	"GDS" Generator Distribution Board. 800A 277/480V. 3 phase, 4 wire, 65 KAIC, Nema 3R Custom QED-2 Switchboard, Square D. Lead time is 52 weeks from Order.	\$ 87,652.00	\$ 87,652.00
4	ASCO 300 Series Automatic Transfer Switch 400A, 3P, 277/480V. 30KAIC, Nema3R. Lead time is 22-24 weeks from Order	\$ 7,033.00	\$ 28,132.00
Sales Tax @ 7.75%, not included in sub total below. Must add tax to PO		\$24,239.06	
Sourcewell Contract Number Reference: 120617-CAT City of San Clemente Sourcewell ID# 47992			
<p>Pricing valid for purchase orders received in 30 days and equipment released by 11/30/22</p> <p><i>Optional adders listed below.</i></p> <p><i>Includes standard features as listed in product data sheet and additional accessories as listed herein...</i></p>			

SALES TAX NOT INCLUDED. Buyer responsible for all taxes including any applicable tire fees. The quotation provided herein is for information only, and is not a valid offer to sell unless signed by an officer of Quinn Power Systems in the space provided below. Any offer to sell or any offer accepted shall be subject to the Terms and Conditions page. Unless expressly stated on the face of this quotation, all prices, delivery schedules and product specifications are subject to change without notice. Quotation is good for 30 days from quote date above, expires after that duration.

Total Price (SALES TAX NOT INCLUDED): \$ 312,762.00



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BILL OF MATERIALS

Genset

Description

- EPA STATIONARY EMERGENCY
- 60HZ 480 VOLT (WYE)
- STANDBY POWER
- 350ekW, 60Hz, 1800rpm
- C13 60HZ PKG 350 CERTESE L2C
- UL 2200 LISTED PACKAGE GEN SET
- IBC SEISMIC CERT OF COMPLIANCE
- ENGLISH INSTRUCTION LANGUAGE
- GENERAL EPG
- PUBLIC OR CIVL SERVICES
- STANDBY POWER
- SPACE HEATER 12
- 130C TEMP RISE OVER 40C AMB
- LC6114B SE ALT U4
- INTEGRATED VOLTAGE REGULATOR
- DUSTPROOF CONTROL PNL (IP52)
- GEN RUNNING & FAULT RELAY
- PERMANENT MAGNET EXCITATION 03
- BATTERY DISCONNECT SWITCH
- 600:5 CT RATIO
- GEN MOUNTING DUCT PLATE
- 90% FUEL ALARM PANEL & SENSOR
- NO COLD WEATHER BUNDLE.
- AUD&VIS FUEL ALARM (90% LEVEL)
- EXTERNAL ANALOG INPUT
- WIDE BASE W/EXTENSION 04
- 1800 GAL SUB TANK BASE
- OVERFILL PREV & SPILL CONTAIN.
- SA LVL-2 ENC WHITE W/O WINDOW
- 150 MPH IBC CERT WIND ENCLOSURE
- SOUND ATT LEVEL 2 ENCLOSURE
- EMCP4.2B CONTROL PANEL
- DISCRETE I/O MODULE
- GROUND FAULT RELAY INDICATION
- STANDARD WET BATTERY
- BATTERY CHARGER 10 AMP
- JACKET WATER HTR PUMP STYLE 03
- CONTROL PANEL MOUNTING LEFT
- 125A LOAD CENTER
- HEATER CONTROL GROUP
- SINGLE CIRCUIT BREAKER
- POWER CENTER - RH MOUNTED
- 600A LSI SINGLE MANUAL CB
- SUSE DECALS & FILMS
- 1ST BREAKER AUXILIARY CONTACTS
- NEUTRAL BAR NDTs1
- NEUTRAL CABLE GP 800A
- STD AIR CLEANER - LIGHT DUTY
- STANDARD RADIATOR
- SA LEVEL 2 MUFFLER



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- LOCAL ANNUN NFPA99-110/CSA282
- (1)QTY REMOTE ANNUNC
- REMOTE E-STOP BUTTON
- DEVICE SERVER
- STD TEST - PKG GEN SET 0.8 PF
- ALTERNATOR TEST REPORT
- 4 HOUR TEST REPORT @ 0.8PF
- CAT DECALS
- PGS TEST REPORT @ 0.8 PF

#1	ATS	AMPS: 0400	QTY: 4
Product	: Series 300	Catalog Number	: J3ADTSA30400NGXM,1UP,11BE 18RX,44G,125A
Service Voltage / Hz	: 480V/60Hz	Optional Accessories	: 1UP,11BE,18RX,44G 125A Activate 31Z
Bypass Isolation	: Not Applicable	Product Description	: 300 Series, Automatic Delayed Transition Transfer Switch
No. of Switched Poles	: 3	Neutral Configuration	: Solid [A]
Withstand Rating:	: See WCR table below	No. of Cables & Lug Size	: 1, #4 AWG to 600 MCM or (2) 1/0 AWG to 250 MCM
Frame = J, Switch Rating = 0400, Series = 300			
Enclosure	: 3R(M)-UL Type 3R secure double door enclosure (See Disclaimer 3)	Service	: Three Phase, 4-wire
Extended Warranty	: Not Included (Years - Cost)	Markings	:

#	ACCESSORY DESCRIPTIONS	
	Accessory Code	Description
1	1UP	UPS backup power for controller to run for up to approximately 3 minutes without AC power
2	11BE	Adds the following features to the Group G controller: (1) Serial RS-485 Modbus Communications (2) Multi-Schedule Engine Exerciser (3) a 300 Entry Event Log and (4) a common alarm output function. When applied on 3-phase systems it also enables: (1) 3-Phase Emergency Source VLL sensing (2) Phase Rotation Monitoring (3) Emergency Source VLL Unbalance Monitoring.
3	18RX	REX (Relay Expansion Module) with Normal and Emergency available output contacts (18B & 18G)
4	31Z	Load disconnect contacts, with TD which operate before/after transfer
5	44G	Strip heater w/ thermostat, wired to load terminals: 208-600 volts
6	125A	Seismic



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Accessories and/or modifications

- Initial fill of coolant and lube oil
- (1 set) Operation & Maintenance manuals (electronic copy) * (additional sets, at additional cost)
- Factory standard warranty - 5 years from startup service
- Fuel Tank Normal Vent Extension (12'ft above grade) *
- *Platform – dual sided with stairs and hand rails, galvanized steel. Ship loose and install by others

QPS field work

- Delivery to jobsite (offload/crane service by others)
- NFPA 110 Startup Service [incl. generator inspection, 2hr load bank & 2hr building load test] ~
- On-site Training Session [single, 4 hour day]
- Complementary 1 year 1 site visit CVA
- Oil Sampling kits
- ** See adder price below for a separate training session**

Not included

- Sales tax
- Air, building or construct permits
- Offloading/crane service of equipment off delivery truck
- Installation, wiring, piping, plumbing or anchoring of equipment
- Diesel fuel, initial fill or for testing

Optional adders

Additional On-site Training Session [single, 4 hour day] – Add: \$1,100.00

- * = Shipped loose to jobsite, installed on site by others.
- ^ = Installed, assembled or prepared by QPS or 3rd party.
- + = Pre-assembled, removed for shipping, re-installed on site by others.
- ~ = Service truck must be able to park within 25'ft horizontally & vertically of unit, over 25'ft at additional cost, based on T&M and billed direct from QPS Service department.

Availability:

- Submittals:** Estimated (8+ Weeks) on receipt and approval of purchase order. (1 electronic copy)
- Equipment:** Estimated (71-75 Weeks) for factory build time after submittal approval.
- Modifications:** Estimated (Additional time TBD) additional time will vary depending on 3rd party or Quinn shop schedule and scope of work.
- Not included:** Unforeseen factory delays, transit time from factory or vendor and/or delays due to project site readiness.
- ** Equipment prices and lead times are subject to change without notice.****

NOTES, EXCEPTIONS, CLARIFICATION

- Quinn Power Systems is not a general electrical or installing contractor. Providing equipment and services as described above only.
- The equipment offered in this proposal is CAT standard product (with modifications) as listed above based specification Appendix F (26 pages, dated July 2022), engineer supplied sizing report and CAT spec sheets, and Exhibit-1 - 4 drawing (undated), provided for review. No other written details, plans, specification sections, contract documents, general or supplementary conditions apply to this quotation. Equipment is as stated above, call for any revisions to equipment quoted. Exception taken to anything not included in this proposal and as listed below.
- Quotation does not include any Sales Tax, Air District or Building Permits. Off-loading or Crane Services, Installation or Anchoring, Initial Fuel fill or Test fuel. Major Testing unless otherwise specified in the Bill of Materials.
- Depending on final height of installed generator set, a working platform may be required to access the control panel and maintenance doors. Platforms are not included in this proposal, unless stated above. Call for revised quotation if required.
- Startup/Commissioning Services are provided for CAT factory/QPS supplied equipment only. Scope of work for Startup Services available upon request. Out of Scope services are billed on a Time & Material basis in the field at purchaser's expense. QPS standard labor rates apply. Technician services are provided during normal business hours Monday through Friday.
- Exception taken to any NETA 3rd party or independent testing requirements. Any and all testing as listed above to be provided by QPS technicians.
- **Supplying CAT standard engine and components only. All fuel by others, all installation by others.**
- **1.02 - Exception**
- **2.02 – This generator was sized by Nicole Han from Michael Baker International. QPS not responsible for final sizing of project.**
- **2.05C – Supplying CAT factory standard internal IBC/seismic vibration isolators**



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- 2.05D - exception
- 2.07 – Providing CAT factory standard silencer for L2 sound enclosure. Exception to all non-CAT factory standard items. Stainless steel is not included
- 2.10 – Providing CAT factory standard control panel
- 2.11 – Circuit Breaker is not in a Nema 3R enclosure, but it is located inside the sound attenuated weather enclosure. Providing 600A Main line circuit breaker to match generator output @ 480V
- 2.13 – Generator enclosure cannot be defined as Nema 3R. Providing level 2 sound/weather enclosure. Providing CAT factory standard level 2 sound enclosure
- 3.01B – providing CAT factory standard 4 hour factory test. Witness test not available at this time. Exception to witness testing.
- 3.02C – all fuel by others
- 3.04 – exception, providing CAT factory standard paint
- 3.06 – exception – per QPS service representative that calls on the City of San Clemente, the city already buys oil sample kits from QPS and does their own oil sampling. 8 oil sample kits will be provided, sampling by others
- 3.07B – QPS reserves the right to invoice after 90 days after receipt in our local City of Industry locations. QPS will require a storage agreement after 90 days of receipt of unit, an applicable fee of \$1000.00 per month will apply after 90 days.

ASCO Notes:

ASCO Power Technologies reserves the right to amend, withdraw or otherwise alter this submission without penalty or charge as a result of any event beyond its control arising from or due to the current Covid-19 epidemic or events subsequent to this epidemic / pandemic including changes in laws, regulations, by laws or direction from a competent authority.

ESTIMATED SHIP DATES ARE SUBJECT TO CHANGE.

This quotation is based on Drawing Sheet Exhibit 1 and Specification Section 16446 Pages 1-5 (all undated).

1. Par 3.02 - ASCO standard Start-Up Assistance only is included. Exception taken to all 3rd-Party testing (NETA, etc.)
2. The Withstand Rating is 42kA at 480V when coordinated with any breaker capable of clearing a fault current in 0.05 sec or less (time-based rating).
3. For dimensions and additional information, see ASCO Outline Drawing 1001393-0204.

Start-Up as quoted is based on standard startup service being provided in one trip, Monday to Friday, 8:00am to 5:00pm. Startup is quoted as a package price. It will be invoiced when the transfer switch ships and is payable net 30 days from invoice. This price is valid only at time of switch order. If additional hours / site visits are required due to circumstances beyond the control of ASCO, we will require additional purchase orders based on time and material at the current ASI labor rates. A two-week prior scheduling notification is required.

Shipping and Handling ESTIMATE is to the first destination. Freight terms as quoted are FOB factory. If delivery on a truck with a lift gate is necessary, extra charges will be incurred.



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EMISSIONS NOTE

➤ "California Air Resources Board (CARB) has approved alignment with the federal New Source Performance Standards (NSPS). Such alignment allows for emergency standby engines to be exempt from Tier 4 emissions standards; however, local air districts can require more stringent emissions control. The prospective buyer of the equipment quoted above is hereby notified the NSPS exemption does not apply to non-emergency standby engines (e.g. prime power applications such as peak shaving, parallel operation with the grid, or storm avoidance), or portable engines, even if used for emergency standby. Consult the local air district for permitting requirements and required emissions controls. Presently, South Coast Air Quality Management District (SCAQMD) Rule 1470 requires the use of a particulate filter if an engine is located within 100 meters of a school, and may require either a diesel particulate filter or an oxidation catalyst, depending upon engine size, if the installation is within 50 meters of a sensitive receptor. Particulate filters may also be required for Title V and major polluting facilities. For emissions requirements specific to the project for which this engine is being quoted, please contact SCAQMD at 909-396-2000. Unless otherwise listed above a DPF is not included in this proposal, please call for quotation if a DPF is required for this project."

➤ Caterpillar engines require a minimum of 30% load to prevent engine damage due to wet-stacking. Depending upon the permit and site specific conditions, SCAQMD emergency engine permits will only allow between 20 and 50 hours of runtime per year for non-emergency applications such as testing and exercising. Passive Diesel Particulate Filter systems depend on generator loading of a minimum of 50-60% to achieve minimum exhaust temperature threshold to keep soot regeneration and the filter backpressure within acceptable levels. If the engine will be operated consistently at low loads/low exhaust temperatures, the customer should make provisions to add load via facility operations or a load bank. Active Diesel Particulate Filter systems require no external load in order to regenerate. If listed above, Passive DPF option pricing, does not include a load bank or a load bank circuit breaker. If a load bank is needed for this project, please call for quotation.

TERMS AND CONDITIONS

1. Acceptance of Order.

This Quotation is for Buyer's information only and is not a valid offer to sell unless signed by an authorized representative of Seller in the place provided on the face of this Quotation. Prices, terms and conditions in an order from Buyer, which are inconsistent with the prices, terms and conditions of this Quotation, will be rejected by Seller, and are of no force and effect unless accepted in writing by Seller. Prices, delivery schedules and the scope of work on this Quotation are subject to change at Seller's discretion.

2. Liability.

Seller's liability on any claim of any kind, including claims for negligence, or for any loss or damage arising out of or connected with the manufacture, sale, delivery, installation, resale or use of any products covered by or furnished under any order connected with this Quotation shall be limited to those claims arising solely from the acts of Seller and Seller shall in no way be liable for any special, indirect, incidental or consequential damages. The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use, revenue, reputation and data, costs incurred, including without limitation, for capital, fuel, power and loss or damage to property or equipment. Buyer expressly acknowledges and agrees that Seller has set its prices in reliance upon the limitations of liability and other terms and conditions specified herein, which allocate the risk between Seller and Buyer and form a basis of this bargain between the parties. Any claims against Seller for shortages in shipments shall be made in writing to Seller within fifteen (15) days of receipt of shipment by Buyer. Unless otherwise provided for in writing, Seller's responsibility for shipment ceases upon delivery to carrier, and any claims for shortage, delays or damage occurring thereafter shall be made direct to carrier by Buyer. Seller shall not be liable for any delays in delivery attributable to strikes, labor disputes, lockouts, accidents, fires, delays in manufacture or in transportation, to Buyer, Buyer's assigns, successors, purchasers, lessees or licensees, or to any person or entity for any claims, losses, expenses or judgments arising out of or resulting in any way from the product or integration of compatibility of the product with any other components, processes, facilities or equipment that does not comply with the equipment manufacturer(s)'s recommendations.

3. Shipments.

Unless otherwise specified, all risk of loss from the goods shall shift to Buyer at such time as the goods are delivered to a carrier for shipment to Buyer. Unless otherwise specified, shipment dates are approximate and all quoted prices exclude shipping costs. Shipment of goods under any order accepted by Seller shall be subject to the approval by Seller of Buyer's financial condition at the time of shipment. Whether or not terms of payment are specified elsewhere, Seller may, at its option, condition shipments under any order accepted by Seller upon receipt of satisfactory security or of cash prior to shipment. If, at Buyer's request, shipment of goods under any order accepted by Seller is delayed more than thirty (30) days after the shipment date specified in the order, or the date the goods are ready for shipment, whichever is later, Seller will require immediate payment in full and/or assess additional charges for the expenses incident to such delay.

4. Termination.

In the absence of a written agreement between Buyer and Seller expressing different terms and conditions as to termination, any order accepted by Seller may be terminated prior to completion by Buyer only upon written notice to Seller and payment of Seller's termination charges. If notice of termination is received by Seller after Seller has committed to buy the principal components for any order, termination charges shall include all direct and indirect costs incurred by Seller and the total profit anticipated by Seller. Additionally, Buyer's instruction to Seller to stop work for thirty (30) days during the time specified for performance in any order may be construed by Seller as the equivalent of written notice of termination from Buyer and previous stipulations will be in effect.

5. Taxes.

Unless expressly stated, Seller's prices do not include sales, use, excise or similar taxes, which Seller may be required to pay in filling Buyer's order. The amount of any applicable tax shall be paid by Buyer as an additional charge unless specifically included in any order accepted by Seller, or in lieu thereof, Buyer shall provide Seller with a tax exemption certificate acceptable to the taxing authorities.

6. Patents.

Seller shall, at its own expense, defend and save Buyer harmless from the expenses and consequences of any suit or procedure brought against Buyer, based on a claim that the use or sale of goods specified in any order accepted by Seller constitutes an infringement of any United States letters of patent in existence on the date of any such order; provided Buyer promptly notifies Seller in writing of such claim and gives the necessary authorization, information and assistance for the defense of such a claim.

7. Changes.

Seller, and Seller's suppliers, may, at any time, without notice to Buyer, make changes (whether in design, materials, the addition of improvements, or otherwise) in any goods specified in any order accepted by Seller without incurring any obligation of any kind as a result thereof, but only to the extent that such change does not cause the goods specified to fail to meet Buyer's requirements. Buyer may, in its order, provide for changes in its requirements with provision for a corresponding equitable change in the price, if any; but in no instance shall Buyer make changes, which are substantially different from the scope of the original order accepted by Seller.

8. Export Sales.

In the event the goods and services specified in any order accepted by Seller are for export, the Buyer shall be responsible for securing export, import and other licenses or authorizations as may be required. The conditions specified in this Section apply to all export transactions. This transaction is only for the sale of the equipment requested and detailed in this Quotation. Not included is any startup assistance, field-testing, training or any other services that might be required on site. Also not included is any installation, installation audits, sea trials (if applicable), or installation materials. To ensure proper application, installation, and warranty integrity, Buyer is encouraged to contact the applicable Caterpillar Dealer for these services. The costs of these services are not included in the sale price nor will Seller be responsible for any such related costs.

9. Permits for Equipment Design, Installation and Operation.

As a supplier of equipment, disclaims responsibility for any and all permits or licenses necessary to design, install and operate the equipment due to zoning, air quality, environmental, safety, building or construction codes or use permits pertaining to Buyer's particular application of such equipment or any similar type of permit. Special attention should be given to the requirements of local air district rules and California Air Resources Board (CARB) regulations pertaining to permit requirements. Seller is quoting on equipment based on the specifications set forth in this Quotation. If additional equipment or engine modifications are required beyond the specifications, such as additional equipment required for compliance by a local air district or CARB, those items are not included and are the responsibility of Buyer. For example, South Coast AQMD (SCAQMD) Rule 1470 may require controls and limits on particulate matter, especially when the engine installation is within 100-meters from a school, or within 50 meters of a sensitive receptor (defined in Rule 1470). Ultra low sulfur fuel is required for particulate filters. CARB Diesel Fuel, or other CARB-approved alternative fuel, is also required for compression ignition (CI) engines operated in California. When indicated in the bill of materials, the proposed equipment may be SCAQMD pre-approved as Certified Equipment. This certification does not eliminate the permit process or responsibility of others to obtain a permit. Procurement of certified equipment assures permitability, reduces the permit processing fees and reduces the time necessary to obtain the permit through SCAQMD.

10. Start-up, Commissioning and Operating Requirements.

Equipment provided in this Quotation may require start-up and commissioning, including inspection(s), to ensure the equipment is installed in accordance with manufacturer(s)'s recommendations and specifications. If Seller has commissioned the equipment, Buyer agrees not to modify the design or components of the installation such that the modifications would violate any legal requirements of the installation, or would cause the installation to deviate from manufacturer(s)'s recommendations and specifications. Buyer acknowledges and agrees that, with respect to products sold to Buyer in connection with this Quotation, Buyer shall have the sole responsibility to ensure the products are properly installed, operated and maintained in accordance with the manufacturer(s)'s recommendations and specifications, and to determine and



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comply with all applicable Federal, state, local and regulated use restrictions and requirements, including, without limitation, the continuing responsibility to ensure that the use of product is in full compliance with all applicable environmental laws and regulations. Failure to install, operate and maintain the products in accordance with the manufacturer(s)'s recommendations and specifications will invalidate any applicable manufacturer's warranty.

11. Additional material.

Only those items listed in this Quotation are included with any order. For example, unless specifically identified in this Quotation, the following items are not included with any purchased equipment: any exhaust or fuel piping, main fuel tank, fuel, duct work, special tools, insulation, wiring, cable, bus duct, concrete, anchor bolts, rigging or any material or labor incidental to the installation itself. Buyer specifically assumes responsibility for the provision of any such items if not specifically identified in the Quotation.

12. Hours of services.

When included, delivery, startup assistance, field testing, training or any other services required on site will be provided during the normal weekday working hours of 7:00 am to 4:30 pm. Delivery or services occurring at any other time, weekends or holidays is subject to premium charges.

13. Warranty.

The equipment manufacturer's warranty is the only warranty provided in connection with the equipment described in this Quotation. Buyer is responsible for operating and maintaining the equipment as specified by the manufacturer. The manufacturer's warranties are exclusive and in lieu of all other warranties either oral or written, express or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose. Seller is not a manufacturer and makes no warranty and shall not, under any circumstances, be liable for any indirect or special, incidental or consequential damages including but not limited to loss of production, loss of profit, loss of use or business interruption, or any other economic loss, whether arising from contract, tort, strict liability or any other theory of law. Buyer, Buyer's assigns, successors, purchasers or any other person designated to operate the equipment as the end user, is responsible for operating the equipment in accordance with manufacturer(s)'s recommendations and specifications. Failure to perform all scheduled maintenance may result in damage to the equipment, and may be grounds to deny warranty coverage.

14. Terms.

Terms of payment are due upon receipt of invoice with no deductions of any kind for retentions, setoffs, discounts or other similar items. A finance charge of 1.5% per month (not to exceed the maximum allowed by law) will be charged on all past due invoices. When necessary Seller will file a California "Preliminary 20-day notice" pursuant to Section 3097 of the California Civil Code.

15. Cost additives.

A: Unit Cost.

Quotation prices are valid for 30 days only and are based on current market prices as of date of quotation. The Seller reserves the right to adjust the final invoice with a price escalation up to 6% due to 1) purchase orders being received after expiration of quotation, 2) fluctuations in raw materials market prices at time of order, 3) labor rate increases at time of scheduled field services, 4) delays in submittal approvals and/or release of equipment or 5) additional items or services provided that were not included as part of the original quotation. Since final invoicing can and may take place up to a year or more from original quotation date.

B: Delays.

If delivery is delayed by customer Buyer beyond original shipment date, purchase price is due 30 days after original shipment date and a storage and handling charge will be applied and is due each month until delivery. Finance charge of 1.5% per month (not to exceed the maximum allowed by law) is applicable on any amounts arising hereunder or in connection herewith that are not paid when due.

C: Start up.

If construction of the facility or other delays are experienced or expected, which prohibit the initial startup of the equipment beyond one year from delivery additional costs may be imposed including, but not be limited to, long term storage preparation, inspection charges, parts, service, etc.

16. Lead Times.

Lead times are based on manufactures estimated timetables. Project completion time may vary due to delays in receipt of purchase orders, submittal approval, release of equipment, manufactures unforeseen delays in production or holiday schedules. Project completion time frame cannot be guaranteed. Back orders will be processed as soon as available. Part number changes may be made to provide latest improved interchangeable items of equipment.

17. Governing Law and Venue.

The rights and obligations of the parties with respect to the transactions contemplated by this Quotation shall be governed in all respects by the laws of the State of California. The parties hereto irrevocably agree that the exclusive venue for any litigation arising in connection with the transactions specified in this Quotation shall be in the courts located in the County of Los Angeles, California.

18. Attorneys' Fees and Costs.

In the event of any legal action, controversy, claim, or dispute between the parties involving the transactions contemplated by this Quotation, the prevailing party shall be entitled to recover from the other party reasonable expenses, attorneys' fees, and costs.

19. Additional Conditions.

Buyer shall furnish to Seller, at no cost, suitable working space, storage space, adequate heat, telephone, light, ventilation, regulated electric power and outlets for testing purposes (if applicable). The facilities shall be within a reasonable distance from where any applicable services are to be provided. Seller and its representatives shall have full and free access to the equipment in order to provide any applicable services. Buyer shall provide the means to shut-off and secure electric power to the equipment and provide safe working conditions. Buyer shall not require Seller or its employees, as a condition to site access or otherwise, to further agree or enter into any agreement, which waives, releases, indemnifies or otherwise limits or expands any rights or obligation whatsoever. Any such agreements shall be null and void. Seller is under no obligation to remove or dispose of parts or equipment unless specifically agreed upon in Seller's scope of work. Seller-removed parts become the property of Seller. Seller must not perform any electrical power switching unless specifically requested by Buyer, under the supervision of Buyer, and subject to procedures jointly agreed to in advance. Notwithstanding Buyer's request, Seller may refuse to perform power switching, if in the opinion of Seller, such action would be unsafe. IN THE EVENT THAT SELLER PERFORMS POWER SWITCHING, TO THE FULLEST EXTENT PERMITTED BY LAW, BUYER SHALL INDEMNIFY, DEFEND, AND HOLD SELLER HARMLESS FROM ANY AND ALL LIABILITY, ACTIONS, SUITS, CLAIMS, DEMANDS, DAMAGES, COSTS, AND EXPENSES ('LOSSES') ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR RESULTING FROM SELLER'S PERFORMANCE OF POWER SWITCHING, REGARDLESS OF WHETHER THE LOSSES RESULT FROM SELLER'S NEGLIGENCE (WHETHER ACTION OR PASSIVE, AND WHETHER SOLE, JOINT, OR CONCURRENT), AND EVEN THOUGH CAUSED IN WHOLE OR IN PART BY A PRE-EXISTING DEFECT, STRICT LIABILITY, OR OTHER LEGAL FAULT OF SELLER. THIS INDEMNITY SHALL APPLY TO ANY ACTS OR OMISSIONS OR NEGLIGENT CONDUCT, WHETHER ACTIVE OR PASSIVE, ON THE PART OF EITHER SELLER OR BUYER. If OSHA or any other federal, state or local government, trade association, or contractual regulations or standards require a "safety person" to be on site during the performance of services, or in the event of a trade union jurisdictional dispute where trade union represented personnel are required to assist or stand by during the performance of services by Seller, Buyer shall be responsible for providing for and paying for any charge or wages for such person(s), as applicable. Buyer shall immediately inform Seller, in writing, at the time of order placement and thereafter, of any unsafe or hazardous substance or condition at the site, including, but not limited to, the presence of asbestos or asbestos-containing materials, and shall provide Seller with any applicable Material Data Safety Sheets regarding the same. Any losses, costs, damages, claims and expenses incurred by Seller as a result of Buyer's failure to advise Seller shall be borne by Buyer. Seller, in its sole discretion and without cost or penalty, reserves the right to cancel its performance under this Agreement or any order immediately upon written notice to Buyer following Seller's discovery of unsafe or hazardous site substance or condition or any other circumstance altering Seller performance of Services. Buyer shall appoint a representative familiar with the site and the nature of the Services to be performed by Seller to be accessible at all times that Seller personnel are at the site. Seller shall not be liable for any expenses incurred by Buyer in removing, replacing or refurbishing any Buyer equipment or any part of Buyer's building structure that restricts Seller's access. Buyer's personnel shall cooperate with and provide all necessary assistance to Seller. Seller shall not be liable or responsible for any work performed by Buyer.

ACCEPTED BY:

SUBMITTED BY:

By: _____

By: Pete Vainoris

Company: _____

Quinn Power Systems

Date: _____

Phone: 562-201-3428

P.O. #: _____