

Addendum No. 02

TO: PLANS AND SPECIFICATIONS FOR:

**Install Emergency Generator
Langsford House Youth Center
Lee's Summit, MO
PROJECT NO. H2303-01**

Bid Opening Date is: 1:30 PM, Thursday, September 21st, 2023

Bidders are hereby informed that the construction plans and/or specifications are modified as follows:

APPROVED SUBSTITUTIONS:

Cummins Power Generation, Inc for Generator

SPECIFICATION CHANGES:

Section 000110 Table of Contents

ADD: Specification 323113 Chain Link Fence and Gates to Table of Contents.

Section 263213 Engine Driven Generators

ADD: Cummins Power Generation, Inc. as an acceptable generator manufacturer.

Section 323113 Chain Link Fence and Gates

ADD: Specification section to project.

DRAWING CHANGES:

Drawing E100 – ELECTRICAL SITE PLAN (NARRATIVE ONLY)

ELETRICAL PLAN NOTES

REVISE: NOTE E2 TO INDICATE THAT THE GATE SHALL BE LOCATED ON THE SHORT SIDE OF THE FENCE FACING THE BASKETBALL COURT. GATE SHALL CONSIST OF (2) 3'-0" WIDE SINGLE MAN GATES THAT OPEN IN OPPOSITE DIRECTIONS TO MAINTAIN A 6'-0" WIDE UNOBSTRUCTED CLEARANCE. CENTER GATE ON THAT SIDE OF THE FENCE.

Drawing P100 – PLUMBING SITE PLAN

DETAIL 1 AND 2

REVISE: PLAN AND DETAIL TO SHOW FENCE AND REVISE NOTE TO CLARIFY THE GAS LINE SHALL COME UP FROM BELOW GRADE WITHIN THE FENCE ENCLOSURE. SHUTOFF VALVE AND ALL GAS PIPING SHALL BE WITHIN FENCE.

ATTACHMENTS:

1. P100 – Plumbing Site Plan
2. Section 000110 Table of Contents
3. Section 263213 Engine Driven Generators
4. Section 323113 Chain Link Fence and Gates

September 14, 2023

END ADDENDUM NO. 2

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SECTION 263213 – ENGINE DRIVEN GENERATORS

PART 1 - GENERAL

1.1 SECTION INCLUDES:

- A. Gas-engine generator sets for standby power supply with the following features and accessories:
 - 1. Engine-generator set.
 - 2. Battery charger.
 - 3. Starting battery
 - 4. Muffler/silencer.
 - 5. Generator overcurrent and fault protection.
 - 6. Exhaust piping external to set.
 - 7. Outdoor enclosure.
 - 8. Vibration isolation devices.
 - 9. Remote annunciator.
 - 10. Unit-mounted cooling system.
 - 11. Unit-mounted control and monitoring.
 - 12. Remote stop switch.

1.2 DEFINITIONS

- A. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.
- B. Steady-State Voltage Modulation: The uniform cyclical variation of voltage within the operational bandwidth, expressed in Hertz or cycles per second.
- C. LP: Liquid petroleum.
- D. EPS: Emergency power supply.
- E. EPSS: Emergency power supply system.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate layout and installation of generators and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

- B. Coordinate sizes and locations of concrete bases with actual equipment provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.4 SUBMITTALS

- A. Product Data: Include the following:
 - 1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
 - 2. Thermal damage curve for generator.
 - 3. Time-current characteristic curves for generator protective device.
- B. Shop Drawings: Include the following:
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
 - 3. Diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams showing terminal markings for engine generators and functional relationship between all electrical components.
- C. Coordination Drawings: For each equipment room and equipment yard, provide dimensioned layout of the electrical equipment within the space, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved.
 - 1. Dimensioned concrete base, outline of equipment, conduit entries, and ground rod locations; including equipment working clearances and manufacturer required access space.
- D. Qualification Data:
 - 1. For manufacturer.
- E. Source Quality-Control Reports: Including, but not limited to, the following
 - 1. Certified summary of prototype-unit test report.
 - 2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
 - 3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria.
 - 4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
 - 5. Report of sound generation.
 - 6. Report of exhaust emissions showing compliance with applicable regulations.

- a. For installations where field-deployed after treatment devices are utilized to meet emission standards, provide manufacturer certification.
 - 7. Certification of Torsional Vibration Compatibility: Comply with NFPA 110.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals.
 - 1. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
 - a. List of tools and replacement items recommended to be stored at the Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
 - b. Operating instructions laminated and mounted adjacent to generator location.
 - c. Training plan.
- H. Warranty

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Manufacturer Qualifications: A qualified manufacturer. Maintain, within 200 miles (160 km) of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.
- C. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of packaged generator sets and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- F. Comply with NFPA 54.
- G. Comply with NFPA 37.
- H. Comply with NFPA 70.
- I. Comply with NFPA 110 requirements for Level 2, Type 10, Class "X" emergency power supply system.
- J. Engine Exhaust Emissions: Comply with applicable state and local government requirements.

- K. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

1.6 COORDINATION

- A. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include quarterly exercising to check for proper starting, load transfer, and running under load. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Maintenance agreements shall include parts and supplies as used in manufacture and installation of original equipment.

PART 2 - PRODUCTS AND MATERIALS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements provided in Generator Sizing Schedule on drawings, provide comparable products by one of the following, the manufacturer used as the basis of design is listed on drawings:
 - 1. Generac Power Systems, Inc. (Basis of Design)
 - 2. Kohler Power Systems (Alternate #1)
 - 3. MTU Onsite Energy (Alternate #2)
 - 4. Cummins Power Generation, Inc (Alternate #3)

2.2 SERVICE CONDITIONS

- A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
 - 1. Ambient Temperature: Minus 15 to plus 40 deg C.
 - 2. Relative Humidity: 0 to 95 percent.
 - 3. Altitude: Sea level to 1000 feet (300 m)

2.3 ENGINE GENERATOR ASSEMBLY DESCRIPTION

- A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency acceptable to authorities having jurisdiction, and marked for intended location and use.
- C. Power Rating: Standby.
- D. Service Load: Generator system shall be sized to handle load not less than 45 kW.
- E. Power Factor: 0.8, lagging.
- F. Frequency: 60 Hz.
- G. Voltage: 240V ac.
- H. Phase: Single-phase, three wire.
- I. Governor: Adjustable isochronous, with speed sensing.
- J. Seismic Performance: Engine generator housing, engine generator, batteries, battery racks, silencers, sound attenuating equipment, accessories, and components shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- K. Mounting Frame: Adequate strength and rigidity to maintain alignment of mounted components without depending on concrete foundation. Mounting frame shall be free from sharp edges and corners and shall have lifting attachments arranged for lifting with slings without damaging components.
- L. Capacities and Characteristics:
 - 1. Power Output Ratings: Nominal ratings as indicated at 0.8 power factor excluding power required for the continued and repeated operation of the unit and auxiliaries, with capacity as required to operate as a unit as evidenced by records of prototype testing.
 - 2. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.
- M. Generator-Set Performance
 - 1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
 - 2. Transient Voltage Performance: Refer to Generator Sizing Schedule on drawings. Voltage shall recover and remain within the steady-state operating band within three seconds.
 - 3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Refer to Generator Sizing Schedule on drawings. Frequency shall recover and remain within the steady-state operating band within five seconds.
6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. The telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, the system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
8. Start Time: Refer to Generator Sizing Schedule on drawings.

2.4 ENGINE

- A. Fuel: Natural gas.
- B. Rated Engine Speed: 1800 rpm.
- C. Lubrication System: The following items are mounted on engine or skid:
 1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
 2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- D. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.
- E. Integral Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator mounting frame and integral engine-driven coolant pump.
 1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
 2. Size of Radiator: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
 3. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
 4. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, ultraviolet-, and abrasion-resistant fabric.

- a. Rating: 50-psig (345-kPa) maximum working pressure with coolant at 180 deg F (82 deg C), and noncollapsible under vacuum.
 - b. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

- F. Muffler/Silencer
 - 1. Residential type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.
 - a. Minimum sound attenuation 19 dB at 500 Hz.
 - b. Sound level measured at a distance of 10 feet (3 m) from exhaust discharge shall be 95 dBA or less.

- G. Air-Intake Filter: Standard-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

- H. Starting System: 12-V electric, with negative ground .
 - 1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in "Environmental Conditions" Paragraph in "Service Conditions" Article.
 - 2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
 - 3. Cranking Cycle: As required by NFPA 110 for system level specified.
 - 4. Battery: Adequate capacity within ambient temperature range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article to provide specified cranking cycle at least twice without recharging.
 - 5. Battery Cable: Size as recommended by engine manufacturer for cable length indicated. Include required interconnecting conductors and connection accessories.
 - 6. Battery Compartment: Factory fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater shall be arranged to maintain battery above 10 deg C regardless of external ambient temperature within range specified in "Environmental Conditions" Paragraph in "Service Conditions" Article. Include accessories required to support and fasten batteries in place.
 - 7. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
 - 8. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236 and include the following features:
 - a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
 - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to

plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.

- c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
 - d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
 - e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
 - f. Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.
- I. Installation of equipment required for emissions compliance shall include a complete manufacturer certified system, including, but not limited to any additional piping, heating and structural support.

2.5 FUEL SUPPLY SYSTEM

- A. Natural Gas Vapor-Withdrawal System:
- 1. Comply with NFPA 54
 - 2. Carburetor.
 - 3. Secondary Gas Regulators: One for each fuel type, with atmospheric vents piped to building exterior.
 - 4. Fuel-Shutoff Solenoid Valves: NRTL-listed, normally closed, safety shutoff valves; one for each fuel source.
 - 5. Fuel Filters: One for each fuel type.
 - 6. Manual Fuel Shutoff Valves: One for each fuel type.
 - 7. Flexible Fuel Connectors: Minimum one for each fuel connection.
 - 8. Fuel change gas pressure switch.

2.6 CONTROL AND MONITORING

- A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of the generator set. When mode-selector switch is switched to the on position, the generator set starts. The off position of the same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down the generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down the generator set.
- B. Configuration:
- 1. Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted

on the generator set. Mounting method shall isolate the control panel from generator-set vibration. Panel shall be powered from the engine generator battery.

C. Control and Monitoring Panel:

1. Digital controller with integrated LCD, controls, and microprocessor, capable of local and remote control, monitoring, and programming, with battery backup.
2. Analog control panel with dedicated gages and indicator lights for the instruments and alarms indicated below.
3. Instruments: Located on the control and monitoring panel and viewable during operation.
 - a. Engine lubricating-oil pressure gage.
 - b. DC voltmeter (alternator battery charging).
 - c. Engine-coolant temperature gage.
 - d. Running-time meter.
4. Controls and Protective Devices: Controls, shutdown devices, and common visual alarm indication, including the following:
 - a. Cranking control equipment.
 - b. Run-Off-Auto switch.
 - c. Control switch not in automatic position alarm.
 - d. Overcrank alarm.
 - e. Overcrank shutdown device.
 - f. Low water temperature alarm.
 - g. High engine temperature prealarm.
 - h. High engine temperature.
 - i. High engine temperature shutdown device.
 - j. Low lub oil pressure alarm
 - k. Low lub oil pressure shutdown
 - l. Overspeed alarm.
 - m. Overspeed shutdown device.
 - n. Coolant low-level alarm.
 - o. Coolant low-level shutdown device.
 - p. EPS load indicator.
 - q. Battery high-voltage alarm.
 - r. Low cranking voltage alarm.
 - s. Battery-charger malfunction alarm.
 - t. Battery low-voltage alarm.
 - u. Contacts for local and remote common alarm.
 - v. Lamp test.

- w. Hours of operation.
 - x. Remote manual stop shutdown device.
 - y. Air shutdown damper alarm when used.
 - z. Air shutdown damper shutdown device when used.
- D. Remote Emergency-Stop Switch: Flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.
- E. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

- A. Overcurrent protective devices shall be coordinated to optimize selective tripping when a short circuit occurs.
- B. Generator Overcurrent Protective Device:
1. Generator Circuit Breaker: Molded-case, thermal-magnetic type; 100 percent rated; complying UL 489.
 - a. Tripping Characteristic: Designed specifically for generator protection.
 - b. Trip Rating: Matched to generator rating.
 - c. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
 - d. Mounting: Adjacent to or integrated with control and monitoring panel.
- C. Generator Protector: Microprocessor-based unit shall continuously monitor current level in each phase of generator output, integrate generator heating effect over time, and predict when thermal damage of the alternator will occur. When signaled by the protector or other generator-set protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from the load circuits. Protector shall perform the following functions:
1. Initiates a generator overload alarm when the generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other generator-set malfunction alarms. Contacts shall be available for load shed functions.
 2. Under single or three-phase fault conditions, regulates the generator to 300 percent of rated full-load current for up to 10 seconds.
 3. As the overcurrent heating effect on the generator approaches the thermal damage point of the unit, the protector switches the excitation system off, opens the generator disconnect device, and shuts down the engine generator.
 4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.

2.8 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1 and specified performance requirements.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.
- D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
- E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- F. Excitation shall use no slip or collector rings, or brushes, and shall be arranged to sustain generator output under short-circuit conditions as specified.
- G. Enclosure: Dripproof.
- H. Instrument Transformers: Mounted within generator enclosure.
- I. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
 - 1. Adjusting rheostat on control and monitoring panel shall provide plus or minus 5 percent adjustment of output-voltage operating band.
- J. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

2.9 OUTDOOR GENERATOR-SET ENCLOSURE

- A. Description:
 - 1. Vandal-resistant, sound-attenuating, weatherproof steel housing. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure.
 - a. Sound Attenuation Level: Level II
- B. Construction:
 - 1. Structural Design and Anchorage: Comply with ASCE/SEI 7 for wind loads up to 100 mph (160 km/h).
 - 2. Louvers: Equipped with bird screen and filter arranged to permit air circulation when engine is not running while excluding exterior dust, birds, and rodents.
 - 3. Hinged Doors: With padlocking provisions.
 - 4. Space Heater: Thermostatically controlled and sized to prevent condensation.
 - 5. Ventilation: Louvers equipped with bird screen and filter arranged to permit air circulation while excluding exterior dust, birds, and rodents.

6. Thermal Insulation: Manufacturer's standard materials and thickness selected in coordination with space heater to maintain winter interior temperature within operating limits required by engine-generator-set components.
- C. Muffler Location: Within enclosure.
 - D. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
 1. Louvers: Fixed-engine cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
 - a. Automatic Dampers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating.
 - E. Convenience Outlets: Factory-wired, GFCI. Arrange for external electrical connection.

2.10 VIBRATION ISOLATION DEVICES

- A. Elastomeric Isolator Pads: Oil and water resistant and factory cut to sizes that match requirements of the equipment supported.
 1. Rubber Isolator Pads: Elastomer (neoprene or silicone) arranged in single or multiple layers and molded with a nonslip pattern and steel baseplates of sufficient stiffness to provide uniform loading over the pad area.
 2. Fiberglass or cork isolator pads: molded cork or glass fiber not less than 1 inch thick and pre-compressed through 10 compression cycles at 3 times the rated load.
 3. Load range: from 10 to 50 psig and a deflection not less than 0.08 inch per 1 inch of thickness. Do not exceed a loading of 50 psig.
- B. Rubber Isolator Mounts: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements, with encapsulated top- and baseplates. Factory-drilled and tapped top plate for bolted equipment mounting. Factory-drilled baseplate for bolted connection to structure. Color-code to indicate capacity range.
- C. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.
 1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment-mounting and -leveling bolt that acts as blocking during installation.
 2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
 3. Minimum Additional Travel: 50 percent of required deflection at rated load.
 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

6. Finishes: Baked enamel for metal components on isolators for interior use. Hot-dip galvanized for metal components on isolators for exterior use.
- D. Comply with requirements in Div. 23 "Vibration Isolation for HVAC" " for vibration isolation and flexible connector materials for steel piping, exhaust shroud and ductwork..

2.11 FINISHES

- A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard enamel over corrosion-resistant pretreatment and compatible standard primer.

2.12 SOURCE QUALITY CONTROL

- A. Prototype Testing: Factory test engine-generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
 1. Tests:
 - a. Comply with IEEE 115.
 2. Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype shall have been factory tested to demonstrate compatibility and reliability.
- B. Report factory test results within 10 days of completion of test.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.
 1. For installations where field-deployed after treatment equipment is utilized, install equipment in accordance with manufacturer's requirements to ensure the final installation meets the manufacturer's definition of a factory-certified arrangement.
- B. Equipment Mounting:
 1. Install packaged engine generators on cast-in-place concrete equipment bases.

2. Install packaged engine generator with elastomeric isolator pads having a minimum deflection of 1 inch (25 mm) on 4-inch- (100-mm-) high concrete base. Secure to anchor bolts installed in concrete base.
- C. Electrical Wiring: Install electrical devices furnished by equipment manufacturers but not specified to be factory mounted.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in Division 23 Sections. Drawings indicate general arrangement of piping and specialties. The following are specific connection requirements:
1. Install fuel, cooling-system, and exhaust-system piping adjacent to packaged engine generator to allow service and maintenance.
 2. Connect cooling-system water supply and drain piping to gas-engine heat exchangers. Install flexible connectors at connections to engine generator and remote radiator.
 3. Connect fuel piping to engines with a gate valve and union.
 - a. Natural- and LP-gas piping, valves, and specialties for gas piping inside the building are specified in Division 23 Section "Fuel Gas Piping."
 4. Connect exhaust-system piping to engines.
- B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- C. Connect wiring according to Division 26 Section " Low-Voltage Electrical Power Conductors and Cables ."
- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

3.4 IDENTIFICATION

- A. Identify system components according to Division 23 Section "Identification for HVAC piping and Equipment" and Division 26 Section "Identification for Electrical Systems."
- B. Install a sign indicating the generator neutral is bonded to the main service neutral at the main service location.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency:
1. Perform tests and inspections.
- B. Tests and Inspections:
1. Perform tests recommended by manufacturer and each visual and mechanical inspection and electrical and mechanical test listed in first two subparagraphs below, as specified in NETA ATS. Certify compliance with test parameters.

- a. Visual and Mechanical Inspection:
 - 1) Compare equipment nameplate data with Drawings and the Specifications.
 - 2) Inspect physical and mechanical condition.
 - 3) Inspect anchorage, alignment, and grounding.
 - 4) Verify that the unit is clean.
- b. Electrical and Mechanical Tests:
 - 1) Perform insulation-resistance tests according to IEEE 43.
 - a) Machines 200 hp (150 kW) or Less: Test duration shall be one minute. Calculate the dielectric-absorption ratio.
 - 2) Test protective relay devices.
 - 3) Verify phase rotation, phasing, and synchronized operation as required by the application.
 - 4) Functionally test engine shutdown for low oil pressure, overtemperature, overspeed, and other protection features as applicable.
 - 5) Verify correct functioning of the governor and regulator.
2. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here, including, but not limited to, single-step full-load pickup test.
3. Battery Tests: Equalize charging of battery cells according to manufacturer's written instructions. Record individual cell voltages.
 - a. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions.
 - b. Test for contact integrity of all connectors. Perform an integrity load test and a capacity load test for the battery.
 - c. Verify acceptance of charge for each element of the battery after discharge.
 - d. Verify that measurements are within manufacturer's specifications.
4. Battery-Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
5. System Integrity Tests: Methodically verify proper installation, connection, and integrity of each element of engine-generator system before and during system operation. Check for air, exhaust, and fluid leaks.
6. Exhaust Emissions Test: Comply with applicable government test criteria.
7. Voltage and Frequency Transient Stability Tests: Use recording oscilloscope to measure voltage and frequency transients for 50 and 100 percent step-load increases and decreases, and verify that performance is as specified.

8. Harmonic-Content Tests: Measure harmonic content of output voltage at 25 percent and at 100 percent of rated linear load. Verify that harmonic content is within specified limits.
 9. Noise Level Tests: Measure A-weighted level of noise emanating from generator-set installation, including engine exhaust and cooling-air intake and discharge, at four locations on the property line, and compare measured levels with required values.
- C. Coordinate tests with tests for transfer switches and run them concurrently.
 - D. Test instruments shall have been calibrated within the last 12 months, traceable to standards of the National Institute for Standards and Technology, and adequate for making positive observation of test results. Make calibration records available for examination on request.
 - E. Leak Test: After installation, charge exhaust, coolant, and fuel systems and test for leaks. Repair leaks and retest until no leaks exist.
 - F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.
 - G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - H. Remove and replace malfunctioning units and retest as specified above.
 - I. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.
 - J. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.

3.6 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.
- C. Complete installation and startup checks according to manufacturer's written instructions.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.
 1. Coordinate this training with that for transfer switches.

END OF SECTION 263213

SECTION 323113 - CHAIN LINK FENCE AND GATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Chain link fence and gates.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 1. ASTM A 153 Zinc-Coated (Hot Dip) on Iron and Steel Hardware
 2. ASTM A 176 Stainless and Heat-Resisting Chromium Steel Plate Sheet, and Strip
 3. ASTM A 478 Chromium-Nickel Stainless and Heat-Resisting Steel Weaving and Knitting Wire
 4. ASTM A 666 Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar
 5. ASTM A 780 Repair of Damaged and Uncoated Areas of Hot-Dipped Galvanized Coatings
 6. ASTM A 824 Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link Fence
 7. ASTM D 4541 Pull-Off Strength of Coating Using Portable Adhesion Testers
 8. ASTM F 626 Fence Fittings
 9. ASTM F 900 Industrial and Commercial Swing Gates
 10. ASTM F 1043 Strength and Protective Coatings on Metal Industrial Chain-Link Fence Framework
 11. ASTM F 1083 Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

1.3 SUBMITTALS

- A. Product Data: Provide manufacturer's printed product information indicating material characteristics, performance criteria, and product limitations.
- B. Manufacturer's Installation Instructions: Provide published instructions that indicate preparation required and installation procedures and shop drawings.

PART 2 - PRODUCTS

2.1 ACCEPTABLE FENCE MANUFACTURERS:

- A. AmeriFence Corporation, 2901 E 85th St., Kansas City, MO 64132, 913-307-0306
- B. Premier Fence KC, 13400 South Outer Belt Road, Lone Jack, MO 64070, 816-697-2050
- C. Anderson Fence, 4000 E Truman Rd., Kansas City, MO 64127, 816-231-0880

D. Owner-Approved Equal

2.2 MATERIALS

A. Chain Link Fence Fabric:

1. Zinc-Coated Steel Fabric: ASTM A392 hot dipped galvanized steel fabric.
2. Fabricated of 9 gauge wire woven in 2 inch mesh.
3. Fabric height: 6'-0" at generator enclosure, as noted in drawings.
4. Top Selvage: knuckled.
5. Bottom selvage: knuckled.
6. Color: To be chosen from manufacturer's standard range of colors.

B. Gates:

1. ASTM F 900 and/or ASTM F 1184.
2. Provide (2) single swing man gates, each 3'-0" wide, that open towards the basketball court. Refer to section 3.08 below for more information.
3. Gate frames strength and coating:
ASTM F 1083 for Group IA, steel pipe, with external coating Type A, nominal pipe size (NPS)1-1/2 or ASTM F 1043, for Group IC, steel pipe with external coating Type A or Type B, nominal pipe size (NPS) 1-1/2.
4. Furnish latches, hinges, stops, keepers, rollers, and other hardware items required for the operation of the gate.
5. Arrange latches for padlocking to make the padlock accessible from both sides of the gate.
6. Provide stops for holding the gates in the open position.
7. Provide 4-digit padlock to lock gate.
8. Finish: Zinc-coated.

C. Posts:

1. Steel:
 - a. ASTM F 1083, zinc-coated Group IA, with external coating, Type A steel pipe or ASTM F 1043, Group IC steel pipe, zinc-coated with external coating Type A or Type B and Group II, formed steel sections.
 - b. Terminal Posts, Corner Posts and Gate Posts: 2-1/4" O.D. - 0.120 wall SS40 pipe.
 - c. Line Posts: 1-3/4" O.D. - 0.111 wall SS40 pipe.
 - d. Top Rail: 1-1/2" O.D. - .111 wall SS40 pipe.
 - e. Gate Frame: 1-5/8" O.D. - 0.111 wall SS40 pipe.
2. Finish: Zinc-coated.

D. Tension wire: ASTM A 824 Type I or Type II, Class 2 coating. Zinc-coated.

E. Accessories:

1. ASTM F 626. Coat ferrous accessories with zinc.
 2. Furnish truss rods for each terminal post. Provide truss rods with turnbuckles or other equivalent provisions for adjustment.
 3. Tie wire for attaching fabric to rails, braces, and posts: 9 gauge steel wire and match the coating of the fence fabric.
 4. Miscellaneous hardware coatings: ASTM A153.
 5. Finish: Zinc-coated.
- F. Concrete: Concrete for post footings shall have a 28-day compressive strength of 2,500 psi. (17.2 MPa).

PART 3 - EXECUTION

3.1 GENERAL

- A. Install fence to the lines and grades indicated.
- B. Space line posts equidistant at intervals not exceeding 8 feet.
- C. Set terminal (corner, gate, and pull) posts at abrupt changes in vertical and horizontal alignment.
- D. Make fabric continuous between terminal posts.
- E. Repair any damage to galvanized surfaces, including welding, with paint containing zinc dust in accordance with ASTM A 780.

3.2 EXCAVATION

- A. Clear post holes of loose material.
- B. Eliminate ground surface irregularities along the fence line to the extent necessary to maintain a 1 inch clearance between the bottom of the fabric and finish grade:

3.3 POSTS

- A. Set posts plumb and in alignment.
- B. Set corner and gate posts in concrete with 2'-0" minimum embedment in 1'-0" diameter holes.
- C. Set line posts in concrete with 1'-6" minimum embedment in 8" diameter holes.
- D. Consolidate concrete/non-shrink grout thoroughly around each post. Eliminate all voids from concrete and finish to form a dome.
- E. Cure concrete for 72 hours prior to attachment of any item to the posts.

3.4 RAILS

- A. Install a horizontal brace rod at mid height of a gate leaves wider than 5'-0".

3.5 TENSION WIRES

- A. Install tension wire along the bottom of the fence line and attach to the terminal posts.
- B. Install bottom tension wire within the bottom 6 in of the installed fabric.
- C. Pull tension wire taut and free of sag.

3.6 CHAIN LINK FABRIC

- A. Install chain link fabric on the public side of the posts.
- B. Attach fabric to terminal posts with stretcher bars and tension bands.
- C. Space bands at approximately 15 in intervals.
- D. Install fabric and pull taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height.
- E. Fasten fabric to line posts at approximately 15 in intervals and fasten to all rails and tension wires at approximately 24 in intervals.
- F. Cut fabric by untwisting and removing pickets.
- G. Splice by weaving a single picket into the ends of the rolls to be joined.
- H. Install the bottom of the fabric 1 in (plus or minus ½ in above the ground).

3.7 GATES

- A. Install (2) 3'-0" wide gates in the sizes and at the locations shown on the drawings. Gates shall be located on short side of the fence facing the basketball court.
- B. Mount hinged gates to swing as indicated. Gates shall swing in opposite directions such that a 6'-0" wide clearance, with no obstructions, is maintained.
- C. Install latches, stops, and keepers as required.
- D. Weld all corners of gate frames and weld midpoint horizontal brace rod to gate frame.
- E. Weld hinge pins, and hardware or otherwise secure to prevent removal.

3.8 CLEANING

- A. Remove all trash and debris from the site.
- B. Keep areas clean of excess materials and rubbish during and after application.

END OF SECTION



09/11/2023
KELLEY P. CRAMM
LICENSE # E-022323

HENDERSON
ENGINEERS
8345 LENEXA DRIVE, SUITE 300
LENEXA, KS 66214
TEL 913.742.5000 FAX 913.742.5001
WWW.HENDERSONENGINEERS.COM
2250005581
MO. CORPORATE NO. E-556D
EXPIRES 10/31/2024

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT,
DESIGN AND CONSTRUCTION

INSTALL EMERGENCY
GENERATOR - LANGSFORD
HOUSE YOUTH CENTER

525 SE 2nd St.
Lee's Summit, MO 64063

PROJECT # H2303-01
SITE # 7717
FACILITY # 8877717001

REVISION: Addendum 1
DATE: 9/12/2023
REVISION: _____
DATE: _____
REVISION: _____
DATE: _____
ISSUE DATE: 6/16/2023

CAD DWG FILE:
DRAWN BY: ARE
CHECKED BY: HEI
DESIGNED BY: ARE

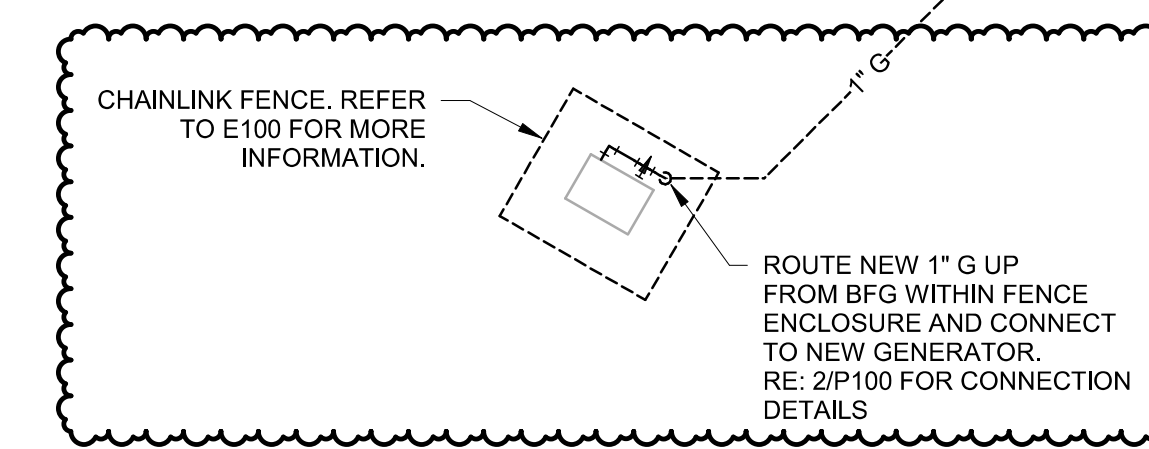
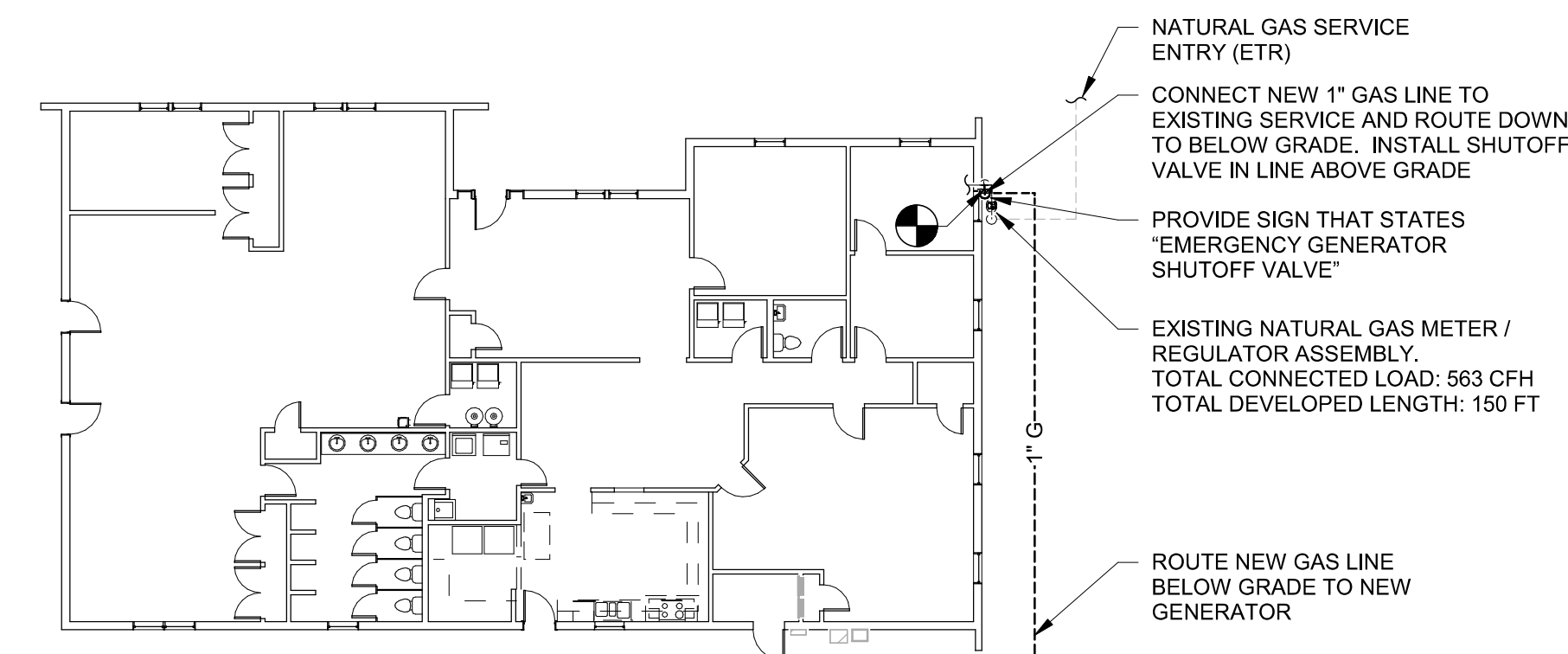
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**PLUMBING SITE
PLAN**

SHEET NUMBER:

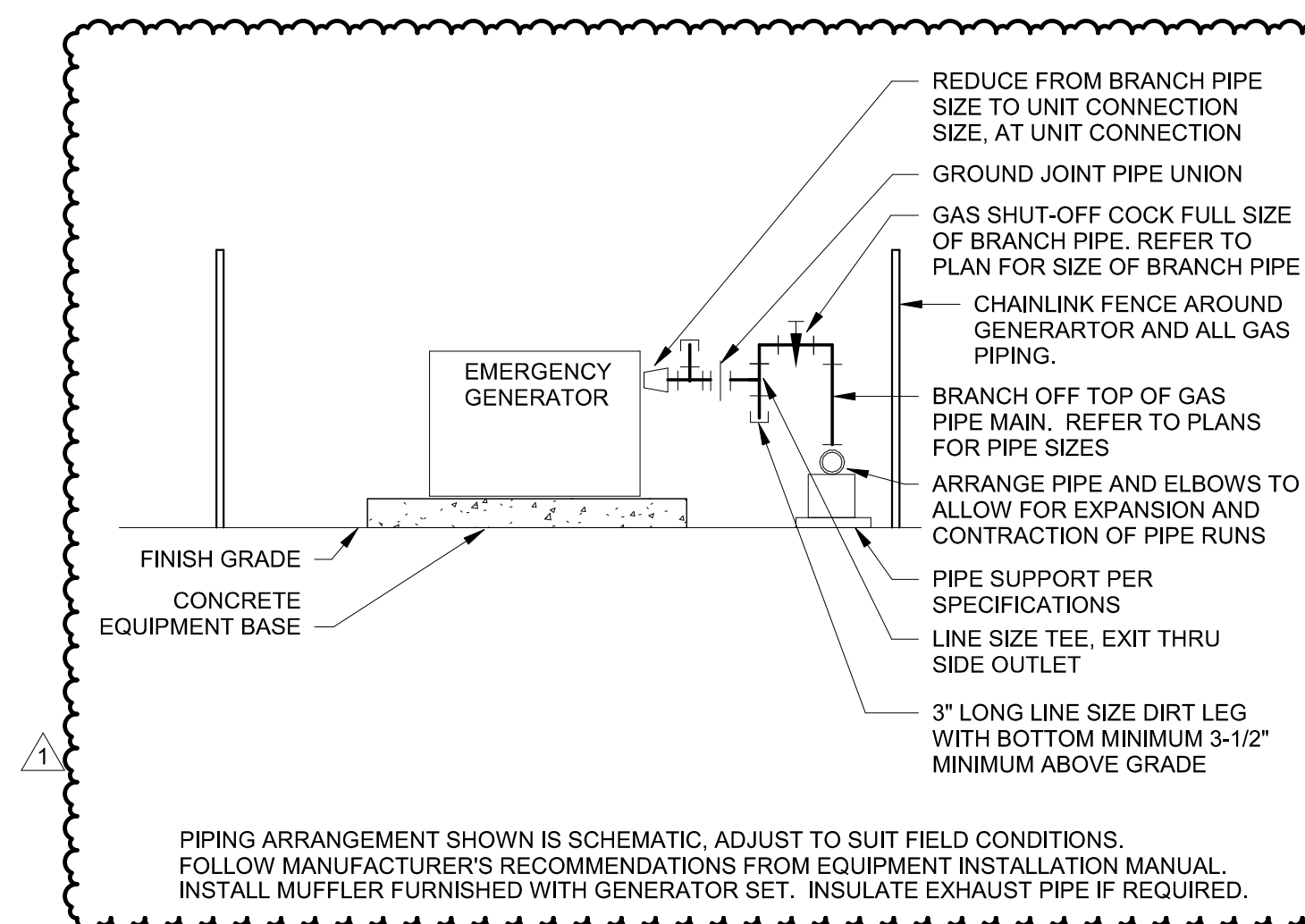
P100

4 OF 4 SHEETS
6/16/2023

PLUMBING SYMBOLS			
THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.			
ANNOTATION		PIPING SYMBOLS	
①	PLUMBING PLAN NOTE CALLOUT	☐	FLOOR SINK (FS), SIZE & TYPE
①	PLUMBING EQUIPMENT DESIGNATION. (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES	☐	FLOOR DRAIN (FD), SIZE & TYPE
①	EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)	☐	ROOF DRAIN (RD), SIZE & TYPE
①	MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)	☐	SHUTOFF VALVE
①	CONNECTION POINT OF NEW WORK TO EXISTING	☐	CHECK VALVE
①	DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER	☐	STRAINER
①	SECTION CUT DESIGNATION	☐	GAS PRESSURE REGULATOR
①	DEDICATED EQUIPMENT ACCESS TILE	☐	CAP
①	ACCESS PANEL	☐	WALL CLEANOUT (WCO)
		☐	FLOOR CLEANOUT (FCO)
		☐	EXTERIOR CLEANOUT (ECO)
		☐	ELBOW UP
		☐	ELBOW DOWN
		☐	TEE UP
		☐	TEE DOWN
		☐	GAS COCK
ABBREVIATIONS		PIPING LINETYPES	
ADA	AMERICANS WITH DISABILITIES ACT	—CW—	DOMESTIC COLD WATER (CW)
AFF	ABOVE FINISHED FLOOR	—HW—	DOMESTIC HOT WATER (HW)
AFG	ABOVE FINISHED GRADE	—HWR—	DOMESTIC HOT WATER RECIRC. (HWR)
AHU	AIR HANDLING UNIT	—140°—	DOMESTIC HOT WATER (140°)
AP	ACCESS PANEL	—S—	SOIL PIPING - ABOVE FLOOR (S)
BAS	BUILDING AUTOMATION SYSTEM	—S—	SOIL PIPING - BELOW FLOOR (S)
BFF	BELOW FINISHED FLOOR	—ST—	STORM DRAIN - ABOVE FLOOR (ST)
BFG	BELOW FINISHED GRADE	—ST—	STORM DRAIN - BELOW FLOOR (ST)
BOP	BOTTOM OF PIPE	—OST—	OVERFLOW STORM DRAIN - ABOVE FLOOR (OST)
BOS	BOTTOM OF STRUCTURE	—G—	NATURAL GAS (G)
BTU	BRITISH THERMAL UNIT	—MPG—	MEDIUM PRESSURE NATURAL GAS (MPG)
CP	CONDENSATE PUMP	—V—	VENT PIPING (V)
CPVC	CHLORINATED POLYVINYL CHLORIDE		
CJ	COPPER		
DI	DUCTILE IRON		
DN	DOWN		
DFU	DRAINAGE FIXTURE UNIT		
DS	DOWNSPOUT		
(E)	EXISTING		
EMS	ENERGY MANAGEMENT SYSTEM		
ETR	EXISTING TO REMAIN		
EWC	ELECTRIC WATER COOLER		
FD	FLOOR DRAIN		
FFA	FROM FLOOR ABOVE		
FFB	FROM FLOOR BELOW		
FF	FINISHED FLOOR		
FL	FLOW LINE		
FLA	FULL LOAD AMPS		
FLR	FLOOR		
GPM	GALLONS PER MINUTE		
HD	HEAD, HUB DRAIN		
HZ	HERTZ		
IE	INVERT ELEVATION		
IN WC	INCHES OF WATER COLUMN		
JB	JUNCTION BOX		
J-BOX	JUNCTION BOX		
KW	KILOWATT		
MAU	MAKE-UP AIR UNIT		
MAX	MAXIMUM		
MBH	1000 BTU PER HOUR		
MH	MANHOLE		
MIN	MINIMUM		
NIC	NORMALLY CLOSED		
N/O	NORMALLY OPEN		
NIC	NOT IN CONTRACT		
ORD	OVERFLOW ROOF DRAIN		
PDI	PLUMBING DRAINAGE INSTITUTE		
PHIØ	PHASE		
PRV	PRESSURE REDUCING VALVE		
PVC	POLYVINYL CHLORIDE		
RCP	REINFORCED CONCRETE PIPE		
RD	ROOF DRAIN		
RPM	REVOLUTIONS PER MINUTE		
RTU	ROOFTOP UNIT		
SF	SQUARE FEET		
SP	SUMP		
SS	STAINLESS STEEL STACK		
TDH	TOTAL DYNAMIC HEAD		
TFA	TO FLOOR ABOVE		
TFB	TO FLOOR BELOW		
TYP	TYPICAL		
UL	UNDERWRITERS LABORATORIES, INC. UNLESS NOTED OTHERWISE		
UPS	UNINTERRUPTIBLE POWER SUPPLY		
VCP	VITRIFIED CLAY PIPE		
VFD	VARIABLE FREQUENCY DRIVE		
VS	VENT STACK		
VTR	VENT THROUGH ROOF		
W/	WITH		
W/O	WITHOUT		
WC	WATER COLUMN		
WS	WASTE STACK		
WSFU	WATER SUPPLY FIXTURE UNIT		
WVS	WASTE VENT STACK		
		EXISTING	NEW
		DEMOLISH	FUTURE
LINETYPE LEGEND			
THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.			
		EXISTING	NEW
		DEMOLISH	FUTURE



① PLUMBING SITE PLAN
1/16" = 1'-0"



② EMERGENCY GENERATOR CONNECTION
NTS

TOTAL CONNECTED NATURAL GAS LOAD		
EQUIPMENT DESIGNATION	DESCRIPTION	CFH (EACH)
F-1	FURNACE (EXISTING)	66
F-2	FURNACE (EXISTING)	66
F-3	FURNACE (EXISTING)	44
F-4	FURNACE (EXISTING)	44
IWH-1	INSTANTANEOUS WATER HEATER (EXISTING)	160
IWH-2	INSTANTANEOUS WATER HEATER (EXISTING)	160
--	GENERATOR	23
TOTAL CONNECTED LOAD =		563
NATURAL GAS SYSTEM OPERATING PRESSURE:		7 IN. W.C.
NATURAL GAS SYSTEM SIZED WITH TOTAL DEVELOPED LENGTH FROM GAS METER TO MOST REMOTE PIECE OF EQUIPMENT:		150 FEET
SYSTEM DESIGN PRESSURE DROP:		0.5 IN. W.C.