PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The requirements of the General Conditions, Supplementary Conditions and the following specification sections apply to all Work herein:
1. Section 26 00 10 – General Requirements
2. Section 26 00 20 – Scope of Work
3. Section 26 05 19 – Electrical Conductors - 600 Volts
4. Section 26 05 26 – Grounding and Bonding
5. Section 26 05 48 – Vibration and Seismic Controls
6. Section 26 08 13 – Testing
7. Section 22 63 13 – Natural Gas Systems

1.2 SUMMARY

Notes	Confirm.

A. Furnish and install the necessary natural gas-driven microturbine system as herein specified and as shown on the Drawings.

1.3 REFERENCE STANDARDS

A. The microturbine system and all components shall be designed, manufactured and tested in accordance with the latest applicable industry standards including the following:
1. UL 2200 – Stand Alone Natural Gas Operation
2. NFPA 37 – Stationary Combustion Engines and Gas Turbines
3. NFPA 70 – National Electrical Code (NEC)

B. All equipment and material to be furnished and installed on this Project shall be UL or ETL listed, in accordance with the requirements of the Authorities Having Jurisdiction, and suitable for its intended use on this Project.

1.4 SUBMITTALS AND PROPOSALS

A. The following submittal data shall be furnished according to the General Conditions and Section 26 00 10 and shall include, but not be limited to:
1. Natural gas microturbine system* including complete system descriptive data of all mechanical and electrical components, efficiency data, control data, verification of Division 25 software interface functions, operational characteristics, fuel system, detailed dimensional information, etc.
2. Layout drawings shall be provided for each microturbine set indicating its location within the confines of the Project. Layout drawings shall include all appurtenances and accessories.

Notes	Emphasize paragraph.

3. Proposed test procedures, recording forms, test equipment, and list of personnel and qualifications for all tests proposed. Refer to Section 26 08 13 titled “Testing” for additional requirements.
4. Factory Test Schedule.
5. Factory Test Reports.
6. Field Test Schedule.
7. Field Test Reports.

Notes	Indicate alternate.

8. Life Cycle Cost Analysis for the proposed system identifying all first costs, applicable rebates, and system payback.
9. Completed utility interconnection agreement prepared for signature by the owner.

B. All items or equipment listed above with asterisks (*) shall be certified by the manufacturer using Manufacturer Certification “MCA” as set forth in Section 26 00 10. See Section 26 00 10 for certification requirements.

1.5 WARRANTY

A. Comply with the requirements of the General Conditions and Section 26 00 10.

Notes	Indicate alternate.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. This entire microturbine generating system, shall be completely built, factory tested and shipped by an assembler/manufacturer who has been regularly engaged in the production of such equipment for the past five years and who has parts and service facilities locally or provides service and parts on a national basis subject to approval by the Owner and Engineer.

B. If it complies with these Specifications, engines manufactured by one of the following manufacturers will be acceptable:
1. Capstone
2. Owner-approved equal

2.2 RATINGS

Notes	Confirm.

A. The microturbine shall consist of a natural gas-driven turbine and shall provide a capacity of 30 kW at Project altitude, 0.8 power factor, 480Y/277 Volts, three (3) phase, four (4) wire, 60 hertz.

2.3 GENERAL

A. The microturbine set shall be a package of new and current equipment consisting of:

Notes	Confirm.

1. A natural gas-driven microturbine to provide electric power.
2. Communication interface panel for monitoring by the Division 25 BMCS. Coordinate requirements with Division 25.
3. Accessories as specified and/or standard with the specified equipment, including onboard gas compressor.

2.4 TURBINE

A. The turbine shall be of the natural gas burning, ultra-low emissions type with air bearing, lubricant free.

B. The output shall be not less than that which is required by the full load rating of the turbine, taking into consideration efficiency losses, under environmental conditions as set out herein. The conditions are as follows:
1. Altitude: 100’
2. Maximum ambient temperature: 110ºF
3. Minimum ambient temperature: 10ºF
4. Power output: 30 kW
5. Output current: 46A
6. Minimum Electrical Efficiency: 25%
7. Sound Level: 65 dBA at 10 meters (33 feet)

2.5 REMOTE MONITORING SYSTEM

A. Provide remote monitoring system and software, MODBUS and BACnet compatible.

2.6 FUEL SYSTEM

Notes	Confirm type; and capacity; and minimum operation.

A. Fuel supply system shall be natural gas. Provide an onboard gas compressor based on an inlet pressure of 1.4-69kPa gauge (0.2-10 psig). Fuel consumption shall be 420,000 BTU/hr.

PART 3 EXECUTION

3.1 INSTALLATION

A. The microturbine generating system shall be installed in accordance with the equipment manufacturer/assembler's written instructions and recommendations to ensure that the system complies with these specifications and serve the intended purpose.

B. The microturbine set shall be anchored to a nominal 4" high concrete equipment pad with vibration isolators. See Section 26 00 10 and Section 26 05 48 titled "Vibration and Seismic Controls" for additional requirements.

3.2 FACTORY TESTING

Notes	Confirm deadline.

A. Before shipment, the complete microturbine unit shall be tested at the factory under actual full load conditions utilizing a load bank to verify the performance and proper functioning of component parts. The load bank test shall be conducted by the manufacturer at the factory at the rated power factor specified for the turbine. The certified factory load bank test data shall be forwarded to the Engineer for review. Test may be witnessed by the Engineer and Owner at their option. At least three (3) weeks written notice of the proposed test date shall be forwarded to the Engineer.

3.3 FIELD TESTING

Notes	Confirm deadline.

A. Installation acceptance testing of the engine generator shall be performed in compliance with the requirements of NFPA 110. The generator full load test shall exceed NFPA 110 and shall be conducted in accordance with Section 26 08 13. Test shall be witnessed by the Engineer. At least two (2) weeks written notice of the proposed test date shall be forwarded to the Engineer.

B. Provide field testing of the communication interface to the BMCS as specified in Division 25.

END OF SECTION