	nderson er Center				
Making Cancer History* RFP 170457/ME - ADDENDUM 2					
RFP Deadline: March 5, 2020 at 2:00 PM (Local Time)		Page: 1 of 27			
RFP Number: 170457/ME		Date: February 19, 2020			
RETURN PROPOSALS AS SHOWN BELOW	RESPON	DENT MUST COMPLETE AND SIGN BELOW			
Copies of proposal required: Seven (7) Copies FAX or TELEX Bids Permitted:	Company Name: Mailing Address:				
Physical Address for Courier Delivery: The University of Texas MD Anderson Cancer Center Attn: Mary Mueller Fannin Holcombe Building 6900 Fannin, 10 th Floor, Suite FHB10.1000 Houston, Texas 77030		(STREET OR BOX #)			
PROPOSALS MUST BE SUBMITTED IN A SEALED ENVELOPE/BOX IDENTIFIED BY THE COMPANY NAME. <u>RFP NUMBER MUST BE</u> <u>SHOWN ON THE LOWER LEFT HAND CORNER OF THE</u> <u>ENVELOPE/BOX</u> .	Telephone No.: E-Mail:	//			
PROPOSALS MAY BE SUBMITTED AT ANY TIME UNTIL RFP DEADLINE NOTED ABOVE. THE UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER RESERVES THE RIGHT TO REJECT ANY AND ALL PROPOSALS OR ANY PART THEREOF.	(Authorized Signat	ture) (DATE)			
ANY PART THEREOF. (Typed or Printed Name and Title) THIS RFP ADDENDUM IS A FURTHERANCE OF A SOLICITATION FOR PROPOSALS AND IS NOT A CONTRACT OR OFFER TO CONTRACT. EI Rio E Infrastructure Updates 1. RFI Questions and Answers are attached including the following: Twenty-Four Questions and Answers Project Manual Table of Contents 2.19.2020 Section 26 32 14 Natural Gas Engine Generator Package 2.19.2020 Drawing A2.13 "Security Plan", Rev. 2.18.2020					
Mary Mueller (Sourcing Specialist) E-Mail address: <u>memuelle@mdanderson.org</u>					

RFI QUESTIONS AND ANSWERS

El Rio E Infrastructure Updates Project No. 170457 RFP No. 170457/ME

RFP Addendum 2, February 19, 2020

RFI No. 1 – 12 Questions

Question 1:

A1.10/ A6	Handrails and legs of prefabricated ramps called out as aluminum on drawings, and
A2.00/ key note 8	galvanized steel in specifications. Per Redd Team (sole specified supplier), they will only
10 28 00	supply aluminum. Please confirm aluminum is correct.

Answer 1: Aluminum handrails and legs for the prefabricated ramps are acceptable.

Question 2:

10 44 00, 2.04	Fire extinguishers called out as recessed in specifications and semi-recessed on floor
A2.00/ key note 13	plan. Please clarify.

Answer 2: Semi Recessed Fire Extinguishers as described in Key Note 13 / A2.00 are acceptable.

Question 3:

A2.00/ key note 39	There are no specifications for dock bumpers and wall-mounted truck shelter. Please
	provide.

Answer 3: Refer to Project Manual Section 08 33 23 Overhead Coiling Doors 2.12 Rigid Dock Shelter and 2.13 Dock Bumpers for specifications of these items.

Question 4:

A2.00	Exterior walls at east are not designated with "WP" wall protection, but section
A3.10/A1	A1/A3.10 shows wall protection. Please clarify if interior of east exterior walls have wall
	protection.

Answer 4: The interior faces of the east exterior walls do **not** receive "WP" wall protection. The rooms associated with these walls are Volunteer Area EPE 1.201, Entrance ERE 1.100, Reception ERE 1.101 and Work Area 1 ERE 1.202.

Question 5:

A2.00	New exterior storefront at east entrance are not designated with "S" manual roller
A3.10/A6	shades, but section A6/ A3.10 shows manual roller shades. Please clarify if new exterior
	storefront at east entrance have manual roller shades.

Answer 5: The new exterior storefront at the east entrance do **not** receive manual roller shades. The rooms associated with this are Entrance ERE 1.100, Reception ERE 1.101, and Volunteer Area EPE 1.201.

Question 6:

C4.1/10	Different foundation details for the bollards. Which is correct?
A1.10/A1	

Answer 6: Use Bollard Detail on Sheet A1.10, Detail A1.

Question 7:

A5.02	Both details calls for the paint for the bollards to be Spec Coating No. 2. This is not
	called out on finish schedule. Please clarify type of paint.

Answer 7: Refer to Project Manual Section 09 96 00 High Performance Coating 3.6 Exterior High Performance Coating Schedule. Use the Galvanized Metal Substrates Epoxy System as scheduled.

Question 8:

A2.00	Opening DR1219 is shown going into the Leukemia room, but is not on the door
A501/A5	schedule. Please provide information for this door.

Answer 8: Add DR 1219 to A5 Door Schedule Sheet A501 as follows:

Door	Location	Fire	Door	Door	Door	Door	Frame	Hdwr
Number		Rated	Width	Height	Thickness	Туре	Туре	
DR 1219	Leukemia		3'-0"	7'-0"	1 3⁄4"	3	А	2

Question 9:

C3.00	Is the high pressure gas line from the main to the meter to be included in our proposal?

Answer 9: The high pressure gas line from El Rio Street to the gas meter is to be installed by CenterPoint. The Contractor is to coordinate this work with CenterPoint.

Question 10:

P000	The Plumbing Fixture Schedule shows the SK-1 sink to be "Integral Provided with
22 40 00	countertop" but spec section 22 40 00 says it is self rimming. Please advise

Answer 10: SK-1 is an undercounter mounted ADA compliant integral SSM sink.

Question 11:

E001 Keyed Note7	Note 7 calls for a Cummins natural gas generator and the specs list Caterpillar, Cummins
26 32 13	and Stewart & Stevenson and diesel. Please advise.

Answer 11:

Remove from Project Manual Section 26 32 13 Packaged Engine Generator Systems. Add to Project Manual Section 26 32 14 Natural Gas Engine Generator Package. Remove the existing Table of Contents and replace with the attached Table of Contents which has updated for the above referenced Division 26 Electrical revisions.

The Basis of Design for the natural gas generator is Cummins Power Generation or Cummins Great Lakes, Inc. as described in Keyed Note 7 Sheet E001. Subject to compliance with requirements, comparable Caterpillar or Detroit Diesel / Spectrum products approved by the Engineer and Owner are acceptable. NOTE! The list of manufacturers has been updated for natural gas.

Question 12:

A1.10/A1	Should the reference be to A1/A1.10 in lieu of A6/A1.11? Also can the bollards be
A1.11/A6	expansion bolted in in lieu of set in the ground?
A2.00 Note 30	

Answer 12:

E5 Key Notes Reno Floor Plan / Sheets A2.00 & A2.10. Revise Key Note 30 as follows: "Ptd. 6" diameter steel bollard. Re: A1/ A1.10."

The bollards shall be set in the ground as shown on Sheet A1.10, Detail A1.

RFI No. 2 – 12 Questions

Question 13: Is there a roof warranty for the building? If so, please provide contact info.

Answer 13: Refer to Project Manual 07 40 00 Roofing: Minor Demolition and Renovation Work, 1.08 Warranty.

Question 14: Is the intent for an open BAS Controls specification? Per Specification 25 00 00 2.02 A:

- 1. To be integrated with Siemens,
- 2. Climatec,
- 3. Convergentz.

Which is correct??

Answer 14:

The only two acceptable BAS bids are:

1. Distech Controls (Tridium Niagara 4) by Climatec

2. Distech Controls (Tridium Niagara 4) by Convergentz

The control subcontractor (Climatec or Convergentz) is to employ Siemens to perform the building connection to the MD Anderson main central monitoring Siemens system. Tridium Niagara 4 shall be the BAS framework utilized for El Rio building. The control subcontractor to submit graphics to the Owner for approval via the submittal process.

Question 15: Will the Fire Alarm system be replaced entirely in the building?

Answer 15: The Fire Alarm system will be replaced in its entirety as specified.

Question 16: Doors: DR1220A3, DR1220A4, DR1220A5, DR1223B, DR1400.3, DR1400B3, DR1400B4, DR1400B5, have a plus and/or minus next to their dimensions on Door Schedule A501. Please provide the dimensions for these doors.

Answer 16: Each of the doors listed above are to be installed in existing openings. The existing openings have been measured to within a reasonable tolerance. Those dimensions are provided on the Door Schedule. The G.C. is to confirm the opening sizes and provide slight adjustments to the door sizes if required.

Question 17: On Door Schedule A501, door DR1219 is missing. This door is shown at Leukemia room ERE1.303 on the Floor Plan A2.00. Please provide door information.

Door	Location	Fire	Door	Door	Door	Door	Frame	Hdwr
Number		Rated	Width	Height	Thickness	Туре	Туре	
DR	Leukemia		3'-0"	7'-0"	1 ³ ⁄4"	3	Α	2
1219								

Answer 17: Add DR 1219 to A5 Door Schedule Sheet A501 as follows:

Question 18: The window on North Elevation D6 on the Exterior Elevations plan A3.02 shows a plus and/or minus next to the window dimensions. Please provide dimensions for this window.

Answer 18: This window is to be installed in an existing opening. The existing opening was measured to within a reasonable tolerance. Those dimensions are provided on the D6 North Elevation Sheet A3.02. The G.C. is to confirm the opening size and provide slight adjustment to the window size if required.

Question 19: Please confirm this will not be a City of Houston permitted project (except for the water line/street cut portion).

Answer 19: This project will **not** be a City of Houston permitted project (except for the water line / street cut portion).

Question 20: Detail E5 shown on Floor Plan (A2.00) missing on Interior Details (A7.10). Please clarify.

Answer 20: Revise this detail call out on Sheets A2.00 and A2.01 to A2 Mullion Detail Sheet A7.10.

Question 21: On drawing A2.13 the Camera Schedule shows PS, PB CR and DC. However, the symbols on the drawing details C4and A4 are very hard to decipher. Please provide counts.

Answer 21: Please see attached revised Sheet A2.13 Security Plan that is noted as Addendum No. 2 - 2.18.2020. The symbols have been enlarged.

Question 22: Note 20/A0.20 states that all IT panels, racks and wiring will be removed by Owner. Will this happen before Contractor takes control of site or during demolition? If during demolition, how long does MDA's data contractor need to remove?

Answer 22: The Owner has revised this scope of work as follows:

"The General Contractor is to demolish all of the existing IT cabling in its entirety except as follows: the 19" racks and the cable verticals are to be salvaged for reuse by the Owner." **Question 23:** Is there any asbestos in the building? If so, will M.D. Anderson perform abatement before construction begins?

Answer 23: The Owner has confirmed that asbestos is **not** present in the building.

Question 24: Is the wall above 12' aff along the south elevation/above the new curtain wall new or existing? See detail below:





PROJECT MANUAL TABLE OF CONTENTS

A – PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS - IUSC

B - SPECIFICATIONS GROUP

DIVISION 01 GENERAL REQUIREMENTS - IUSC

DIVISION 02	EXISTING CONDITIONS	REVISION
02 22 10	Removing Existing Pavements	
02 41 19	Selective Demolition	
02 82 10	Chain Link Fencing	

DIVISION 05	METALS	REVISION
05 40 00	Cold Formed Metal Framing	
05 50 00	Metal Fabrications	
05 52 13	Steel Pipe and Tube Railings	

DIVISION 06	WOOD, PLASTICS AND COMPOSITES	REVISION
06 10 00	Miscellaneous Carpentry	
06 41 16	Plastic Laminate Clad Architectural Cabinets	
06 61 13	Solid Surfacing Countertop Fabrications	
06 64 36	Fiberglass Reinforced Plastic Paneling	

DIVISION 07	THERMAL AND MOISTURE PROTECTION	REVISION
07 21 00	Building Insulation	STERED AROUN
07 26 35	Moisture Vapor Emission Control System	S NEY C 4 MAN
07 27 26	Fluid-Applied Membrane Air Barriers	4:5 V 20:00
07 40 00	Roofing Repair	
07 84 13	Penetration Firestopping	*
07 84 43	Joint Firestopping	S 3. 7 (47)1 96
07 92 00	Joint Sealants	TE OF TE SE
		automatica .

02.18.2020

The University of Texas MD Anderson Cancer Center MS012015 TABLE OF CONTENTS 00 01 10 1 OF 6

DIVISION 08	OPENINGS
08 11 13	Hollow Metal Doors and Frames
08 12 16	Aluminum Frames
08 14 16	Flush Wood Doors
08 31 13	Access Doors and Frames
08 33 23	Overhead Coiling Doors
08 41 13	Aluminum-Framed Entrances and Storefronts
08 71 11	Finish Hardware
08 80 00	Glazing
08 87 33	Decorative Films

DIVISION 09	FINISHES	REVISION
09 05 65	Preinstallation Testing for Flooring	
09 22 00	Portland Cement Plaster	
09 22 16	Non-Structural Metal Framing	
09 29 00	Gypsum Board	
09 30 00	Tiling	
09 51 13	Acoustical Panel Ceilings	
09 61 16	Concrete Floor Sealing	
09 65 13	Resilient Base and Accessories	
09 68 13	Tile Carpeting	
09 84 53	Sound Barrier Mullion Trim Cap	
09 91 00	Painting	
09 96 00	High Performance Coatings	

DIVISION 10	SPECIALTIES	REVISION
10 21 13	Phenolic Core Toilet Compartments	STATED AND
10 26 00	Wall and Door Protection	STEY CLASS
10 28 00	Prefabricated Ramp	14:5 V 12:5
10 28 13	Toilet and Bath Accessories	O X R
10 44 00	Fire Extinguisher Cabinets and Accessories	
10 51 23	Plastic Laminate Faced Wood Lockers	A
10 53 10	Aluminum Canopy	Southanna and a second

02.18.2020

The University of Texas MD Anderson Cancer Center MS012015

TABLE OF CONTENTS 00 01 10 2 OF 6

DIVISION 11	EQUIPMENT	REVISION
11 52 24	Flat Screen TV Mounts	

DIVISION 12	FURNISHINGS	REVISION
12 24 13	Roller Window Shades	

DIVISION 20	COMMON FIRE SUPPRESSION, PLUMBING AND HVAC REQUIREMENTS	REVISION
20 01 00	Basic Fire Suppression, Plumbing and HVAC Requirements	
20 05 13	Motors	
20 05 29	Supports and Sleeves	
20 05 48	Vibration Isolation	
20 05 53	Piping and Equipment Identification	
20 07 19	Piping Insulation	
20 08 00	Fire Suppression, Plumbing and HVAC Systems Commissioning	
20 08 13	Fire Suppression, Plumbing and HVAC Systems Prefunctional Checklists and Start-Ups	
20 08 13 A	Attachment "A" Example of Prefunctional Checklist	
20 08 13 B	Attachment "B" Example of Prefunctional Checklist	
20 08 13 C	Attachment "C" Example of Prefunctional Checklist	
20 08 16	Fire Suppression, Plumbing and HVAC Systems Functional Performance Tests	
20 08 16 A	Attachment "A" Example of Functional Performance Test	
20 08 16 B	Attachment "B" Example of Functional Performance Test	

DIVISION 21	FIRE SUPPRESSION	REVISION AROUND
21 10 13	Wet Standpipe and Sprinkler Systems	S NEY CAN MAN
		9.5 V 12.6
DIVISION 22	PLUMBING	REVISION
22 10 00	Plumbing Piping	* *
22 10 30	Plumbing Specialties	A
22 20 23	Natural Gas Piping	A CONTRACTOR
22 33 33	Electric Domestic Water Heaters (Point-of-Use)	02.18.2020

The University of Texas MD Anderson Cancer Center MS012015

DIVISION 22	PLUMBING	REVISION
22 40 00	Plumbing Fixtures	

DIVISION 23	HEATING, VENTILATING, AND AIR CONDITIONING	REVISION
23 05 93	System Testing, Adjusting and Balancing	
23 07 13	Ductwork Insulation	
23 21 13	Hydronic Piping	
23 21 30	Hydronic Specialties	STRED AROUN
23 31 00	Ductwork	S NEY C HI MIL
23 33 00	Ductwork Accessories	
23 34 23	HVAC Fans	° X Z
23 36 00	Air Terminal Units	
23 37 00	Air Outlets and Inlets	A
23 40 00	Filters	COLOUR OF
23 62 13	Packaged Air Cooled DX Air Conditioning Units	02.18.2020
23 81 23	Computer Room Air Conditioning Units	

DIVISION 25	INTEGRATED AUTOMATION	REVISION
25 00 00	Building Automation Systems (BAS) General	
25 11 00	BAS Basic Materials, Interface Devices, and Sensors	
25 11 09	BAS Operator Interfaces	
25 14 00	BAS Field Panels	
25 15 00	BAS Software and Programming	
25 30 00	BAS Communication Devices	

DIVISION 26	ELECTRICAL	REVISION			
26 01 00	Basic Electrical Requirements				
26 05 19	Cable, Wire and Connectors, 600 Volt				
26 05 26	Grounding				
26 05 33	Raceways, Cable Trays, and Boxes				
26 05 73	Protective Relay and Device Coordination				
26 08 00	Electrical Systems Commissioning				
26 08 13	Electrical Systems Prefunctional Checklists and Start-Ups				
26 08 13 A	Attachment "A" - Example of Prefunctional Checklist				

DIVISION 26	ELECTRICAL	REVISION					
26 08 13 B	Attachment "B" - Example of Prefunctional Checklist						
26 08 16	Electrical Systems Functional Performance Tests						
26 08 16 A	Attachment "A" - Example of Functional Performance Test						
26 09 13	Power Status and Monitoring System						
26 22 13	Non-K-Factor Dry-Type Transformers						
26 24 16	Panelboards						
26 25 13	Low Voltage Busways						
26 27 26	Wiring Devices						
26 28 13	Fuses, 600 Volt						
26 28 17	Motor and Circuit Disconnects						
26 32 13	Packaged Engine Generator Systems	Addendum No. 2					
26 32 14	Natural Gas Engine Generator Package Addendum No. 2						
26 36 23	600 Volt Automatic Transfer Switches						
26 41 00	Lightning Protection Systems						
26 51 00	Lighting Fixtures						

DIVISION 27	COMMUNICATIONS	REVISION
27 00 00	Communications	
27 05 26	Grounding and Bonding for Communications Systems	
27 05 28	Pathways for Communications Systems	
27 05 43	Underground Ducts and Raceways for Communications Systems	
27 05 53	Identification for Low-Voltage Cables	
27 11 00	Communications Equipment Room Fittings	
27 13 00	Communications Backbone Cabling	
27 15 00	Communications Horizontal Cabling	STATISTICS ADD
27 21 33	Data Communications WI-FI Access Points	STE SEY CLASS
		19:5 V 19:00
DIVISION 28	ELECTRONIC SAFETY AND SECURITY	REVISION
28 00 00	Electronic Safety and Security	* /*
28 10 00	Electronic Safety and Security	A

28 10 00	Electronic Safety and Security	A
28 20 00	Electronic Safety and Security	EOF
28 30 00	Fire Alarm and Smoke Detector Systems	02.18.2020

DIVISION 31	EARTHWORK	REVISION		
31 22 13	Site Grading			
31 23 33	Trenching, Backfilling and Compaction			
31 25 00	Erosion and Sedimentation Control			
31 32 13.16	Cement Stabilization			
31 41 33	Trench Safety			
31 43 13	Void Fill			
32 13 13	Concrete Pavement			
32 17 23.13	Painted Pavement Markings			
33 10 00	Water Distribution			
33 50 00	Casing-Boring and Jacking			

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END OF SECTION 00 01 10



SECTION 26 32 14 NATURAL GAS ENGINE GENERATOR PACKAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish one packaged natural gas rich-burn spark-ignited reciprocating engine-generator system, including:
 - 1. Packaged engine generator set.
 - 2. Exhaust silencer and fittings.
 - 3. Fuel accessories.
 - 4. Remote annunciators.
 - 5. Starting batteries, cables, batteries box, and accessories.

1.02 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.

1.03 REFERENCES

- A. NEMA 250 Enclosures for Electrical Equipment (1000 volts maximum).
- B. NEMA MG1 Motors and Generators.
- C. NFPA 37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines 2006.
- D. NFPA 54/ANSI Z223.1 National Fuel Gas Code 2006.
- E. NFPA 70 National Electrical Code 2005.
- F. NFPA 110 Standard for Emergency and Standby Power Systems 2005.

1.04 SYSTEM DESCRIPTION

A. The packaged natural gas rich-burn spark-ignited reciprocating engine-generator system will be used by the University as an emergency and standby power source. The packaged engine-generator system shall be a coordinated assembly of compatible components and comply with NFPA 110 Level 1 requirements for an emergency power supply system. The packaged system will operate in parallel with an existing unit of similar size.

- B. System Capacity: Refer to E001 for kW and required voltage 60 HZ and at 1,500 feet or less above sea level with an ambient temperature between 0°F. and 110°F.
- C. The generator set, and auxiliary and accessory components necessary for proper operation, must fit in available space with proper operating and maintenance clearances and free air space.

1.05 SUBMITTALS – SUBMIT A MINIMUM OF EIGHT COPIES OF ALL REQUIRED SUBMITTALS.

- A. Proposal Information:
 - 1. Manufacturer and model of the packaged engine-generator system.
 - 2. Manufacturer's standard product information for the engine-generator system, with the following information clearly marked or highlighted:
 - a. Generator system standby rating in kW/kV at the specified conditions.
 - b. Generator system dry weight.
 - c. Dimensioned outline plan and elevation drawings of the engine-generator system.
 - d. Engine specifications.
 - e. Required natural gas supply pressure and fuel supply line inlet size.
 - f. Exhaust flow and temperature at rated kW, with maximum allowable backpressure and exhaust outlet size.
 - 3. Fuel consumption rates at various loads.
 - 4. Ventilation and combustion air requirements.
 - 5. Radiator sizing data and heat balance data.
 - 6. Manufacturer's standard product data for the alternator, with the following information clearly marked or highlighted:
 - a. Rating in kW at 105°C Continuous (Rise by Resistance Method, Mil-Std-705) and 130°C Standby (Rise by Resistance Method, Mil-Std-705); 60 HZ; 1800 RPM; 0.8 power factor.
 - b. Subtransient reactance in per unit or percent.
 - c. Insulation system class.
 - d. Typical motor starting kVA vs. % voltage dip chart or table.
 - e. Line-Line Harmonic Maximum Total (Distortion Factor) per Mil-Std-705B Method 601.4a.
- B. Product Data:
 - 1. Detailed data on engine-generator system features, components, accessories, ratings, and performance.

- 2. Thermal damage curve for generator.
- 3. Time-current characteristic curves for generator protective device.
- 4. Proposal information A.1. A.6.
- C. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Detailed dimensioned outline plan and elevation drawings of engine-generator set and other components.
 - 2. Vibration Isolation Details: Basis for selection of vibration isolation products. Specify requirements for vibration isolation bases.
 - 3. Wiring Diagrams and Schematics: Power, signal, and control wiring.
- D. Qualification Data: Manufacturer shall have been in the business of packaging enginegenerators for commercial and institutional emergency and standby power systems for more than ten years.
- E. Certified summary of prototype-unit test report.
- F. Certified Test Reports: For components and accessories that are equivalent, but not identical to those tested on prototype unit.
- G. Test Reports:
 - 1. Report of factory test on unit to be shipped for this project, showing compliance with specified requirement.
 - 2. Report of sound generation. Report of exhaust emissions showing compliance with applicable regulations for units installed in Harris County, Texas.
 - 3. Field quality-control test reports.
- H. Certification of Torsional Vibration Compatibility: Comply with NFPA 110.
- I. Operation and Maintenance Data: Include product data and shop drawings.
 - 1. List of tools and replacement items recommended for storage at the project site for emergency repairs. Include part and drawing numbers, current unit prices, and source of supply.
 - 2. Copies of inspection and test reports.
 - 3. Component installation, operation, and maintenance manuals.
- J. Special Warranty: Submit the manufacturer's warranty statement for the packaged enginegenerator system.
- K. Rigging Diagram: Submit a rigging diagram indicating location and lifting capacity of each lifting attachment and engine-generator center of gravity.

1.06 WARRANTY

A. Special Warranty: Warrant the packaged engine-generator system to be free from defects in materials and workmanship for a period of two years or for 1500 hours of run time, whichever is less, from the date of installation, beginning with substantial completion and beneficial use.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in packaged engine-generator systems.
- B. Supplier Qualifications: Authorized distributor of engine-generator manufacturer with staffed service facilities within 50 miles of the installation site. Manufacturer's recommended repair parts stocked at the service facility. Repair service available 24 hours a day/365 days per year.

1.08 MAINTENANCE SERVICE

- A. Submit prospective contract provisions and contract cost for service and maintenance of packaged engine generator system for one year from the date of installation, beginning with substantial completion and beneficial use. Maintenance tasks should be provided in accordance with the manufacturer's recommendations and NFPA 110 quarterly and semi-annual maintenance tasks, including annual maintenance at the end of the one-year period.
- B. Include maintenance service contract as a separate amount in proposal. The maintenance agreement may be rejected independently of the base proposal for the engine-generator system.

1.09 ADDITIONAL MATERIALS

- A. Furnish additional materials described below that match products installed. Enclose with protective packaging for storage, with package contents identified with external labels.
 - 1. Fuses: One for every 10 of each type and rating, but not less than two of each.
 - 2. Indicator Lamps: Two for every six of each type used, but not less than two each.
 - 3. Filters: Two sets each of lubricating oil, fuel, and combustion-air filters.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS: SUBJECT TO COMPLIANCE WITH SPECIFIED REQUIREMENTS.
 - A. Cummins Power Generation or Cummins Great Lakes, Inc.
 - B. Caterpillar.
 - C. Detroit Diesel/Spectrum.
- 2.02 NATURAL GAS ENGINE
 - A. Type: 1800 RPM; 4-cycle; rich-burn; spark-ignited; reciprocating 16V; turbo-charged and after-cooled.

- B. Rating: Sufficient to operate as a standby power source at rated load at specified elevation and ambient limits with all accessories attached. 1,175 BHP minimum power at rated RPM. 2,924 CI displacement minimum.
- C. Fuel System: Suitable for natural gas supplied by the local distribution company to retail customers. Building natural gas distribution to the engine-generator system will be 5 PSI or less, with the exact pressure range identified by the Owner prior to shop drawing submittal production.
- D. Governor: Isochronous type to maintain engine speed within 0.5 percent, steady state, no load to full load, with maximum speed change or plus or minus 2 percent, and recovery to steady state within two seconds following sudden load changes of up to 50 percent. Equip governor with means for manual operation and adjustment. Maintain frequency regulation within 0.25 percent for any steady-state condition. Governor shall be electronic type.
- E. Safety Devices: Engine shutdown on high water temperature, low oil pressure, overspeed, and engine overcrank. Limits as selected by manufacturer. Provide individual indicating light for each function.
- F. Engine Starting: Cycle cranking function, non-adjustable and automatic for a 15 second duration and in accordance with manufacturer's instructions. Include provisions for a remote starting control circuit, with a HAND-OFF-AUTO selector switch on the engine-generator control panel.
- G. Skid-Mounted Radiator: Closed-loop radiator system including belt-driven pusher fan, coolant pump, and thermostat temperature control. The radiator shall be shipped on the skid with the engine-generator as a complete assembly.
- H. The cooling system shall be rated for full load operation. The cooling system shall be rated by the manufacturer for cooling the set and its auxiliary equipment at an ambient temperature of 45°C.
- I. Engine Accessories
 - 1. An electric starter capable of three complete cranking cycles without overheating before overcrank shutdown (75 seconds).
 - 2. Positive displacement, mechanical, full pressure, lubrication oil pump. Full flow lubrication oil filters with replaceable elements and dipstick oil level indicator.
 - 3. Engine mounted battery charging alternator, 40 ampere minimum, and solid-state voltage regulator.
- J. Mounting: Provide unit with suitable spring-type vibration isolators and mount on heavy duty steel base. The engine-generator set shall incorporate a battery tray with battery hold down clamps with the base rails.
- K. Provide unit with a lube oil heater and a coolant jacket heater, both wired to individual NEMA 12 junction boxes with identification nameplates.
- L. Start Time: Comply with NFPA 110, Type 10 system requirements.

- M. Engine components, including but not limited to, the engine control unit, magnetic pickup, governor and actuators, alternator components, including but not limited to, the voltage regulator which shall be suitable for interfacing with a remote paralleling switchgear-mounted engine generator control package such as the Woodward EGCP-2 microprocessor-based engine-generator control and management controller.
- N. Containment: Integral rupture basin with minimum 110% full capacity for engine fluids.

2.03 GENERATOR

- A. Generator: Synchronous, four-pole, revolving field, air cooled AC generator. Marathon MagmaMAXdvr series or approved equal.
- B. Rating: ____ kW at ____ rpm and 80 percent power factor. ____V. Connections: three-phase, three-wire.
- C. Insulation: Class H insulation class meeting the requirements of NEMA MG1. Provide vacuum-pressure impregnated non-hygroscoping materials.
- D. Alternator: 2/3 pitch factor and fully-linked amortisseur winding. Sub transient reactance: 12% or less. Thermostatically controlled heater to maintain windings above the dew point.
- E. Temperature Rise: 105°C.
- F. Enclosure: Open-drip proof, fully enclosed frame.
- G. A permanent magnet generator (PMG) shall provide excitation power to the automatic voltage regulator for immunity from voltage distortion caused by nonlinear loads on the generator.
- H. Bearings:
 - 1. Provide prepackaged regreasable bearings with a median expected life of 40,000 hours.
 - 2. Insulation. As necessary to prevent shaft-bearing frame currents.
- I. Hardware: Provide structural bolts, washers, nuts, pins, and similar items manufactured of high-strength steel. Use only hexagon-head bolts and hexagon nuts. Use corrosion-resistant materials or protect hardware from corrosion by hot-dip galvanizing, chrome plating or cadmium plating.
- J. Nameplates:
 - Main Nameplate: Provide the generator with a stainless steel nameplate meeting the requirements of the National Electrical Code and NEMA MG 1 for synchronous generators. Include the following additional information on the main or an additional nameplate: insulation system classification, connection diagram, direction of rotation, electric phase rotation for NEMA standard direction of rotation and number of safe starts in succession, including duration of waiting period.
 - 2. Heater Nameplate: Voltage and wattage.
 - 3. Bearings Nameplate: Bearing identification and recommended lubricant.

- 4. Attachment: Attach nameplates to the generator with stainless steel fastening pins or screws.
- K. Terminal Boxes:
 - 1. Description: Provide conduit terminal boxes and terminal housing cabinets for all wiring connections to generator.
 - 2. Material: Make small boxes of cast iron or cast bronze. Make large boxes of cabinet type construction of adequately braced 1/8-inch (11-gauge) sheet steel. Use machine screws to fasten all covers.
 - 3. Gaskets: Use durable gaskets resistant to heat, grease and moisture-laden air to seal all joints between boxes and covers or between boxes and machine enclosure.
 - 4. Auxiliary Leads: Terminate space heater and similar leads on 600-volt rated molded insulation terminal blocks with ring-tongue terminals under screws. Use only corrosion-resistant materials and brass screws. Effectively isolate terminal blocks for different functions by suitable air separation or individual boxes. Permanently identify all leads and terminals.
 - 5. Main Terminal Box: House main generator leads and surge protection equipment in an oversized cabinet with bolted panels. Provide appropriately rated copper bus and individually connect surge arresters and capacitors, and generator leads to bus with appropriate lugs. Allow ample space for stress cone termination of incoming feeder with conduit entrance from above. Include wireways that may be required for generator leads. Provide grounding lug in box for incoming grounding conductor.
- L. Space Heater:
 - 1. Type: Electric resistance, silicon rubber clad or equivalent non-oxidizing exterior, with maximum surface temperature of 130 C (266 F). Alternatively, provide two stainless-steel-sheathed conventional space heaters, each with rated watts at the specified voltage equal to twice the required valve, and connect in series.
 - 2. Wattage: As required to avoid condensation during shutdown, but not less than twice the value given in the Appendix of IEEE Standard 43, Paragraph A1.3 (twice the length in feet times the diameter in feet divided by 35).
 - 3. Voltage: 115 volts, single-phase, 60-hertz for 1500 watts or less; 208 volts, single-phase, 60-hertz for larger.
- M. Surge Protection:
 - 1. Surge Arresters: Metal-oxide type designed for use with rotating machines to be sized by the generator manufacturer for a high resistant grounded system.
 - 2. Surge Capacitors: Provide units used for rotating machines surge protection sized by the generator manufacturer for a high resistant grounded system.
 - 3. Location: In generator main terminal box.
- N. Acceptable manufacturers:
 - 1. Electric Machinery.

- 2. General Electric Company.
- 3. Ideal.
- 4. Siemens
- 5. Or unit normally used by engine-generator manufacturer.
- O. Voltage Regulation:
 - 1. The automatic voltage regulator shall be temperature compensated solid-state design and include overvoltage and overexcitation protection functions. The voltage regulator shall be equipped with three-phase RMS sensing. The regulator shall control buildup of AC generator voltage to provide a linear rise and limit overshoot. Overvoltage protection shall sense the AC generator output voltage, and in the event of regulator failure or loss of reference, shutdown regulator output on a sustained overvoltage of one (1) second duration. Overexcitation protection shall sense regulator output and shutdown regulator output if overloads exceed ten (10) seconds in duration. Both overvoltage and overexcitation protection shutdowns shall be latched, requiring the AC generator to be stopped for reset.
 - 2. The regulator shall include an under frequency roll-off torque-matching characteristic, which shall reduce output voltage in proportion to frequency below a threshold of 58-59 Hz. The torque-matching characteristic shall include differential rate of frequency change compensation to use maximum available engine torque and provide optimal transient load response. Regulators which use a fixed volts per hertz characteristic are not acceptable.

2.04 ACCESSORIES SEE DIESEL SPEC FOR OUTDOOR WEATHER ENCLOSURE IF REQUIRED

- A. Engine Exhaust System: Selkirk Metalbestos IPS engine exhaust piping products (with minimum 2" insulation). Use all stainless steel products. Provide an explosion relief device located ahead of the silencer. Provide exhaust pipe size from the engine to the silencer as recommended by the engine manufacturer, with flexible stainless steel bellow-type exhaust fittings for connections to the engine exhaust manifold.
- B. Exhaust Silencer: Silex JCSA series or approved equal. Super critical grade spark arrestor type with minimum 30-35 dBA attenuation. Material: stainless steel. Connections: ANSI standard flanges. Condensate drain with petcock. Required inlet/outlet orientation information will be provided prior to production of submittals.
- C. Provide GT Exhaust Systems Inc. or approved equal thermal wrap insulation around the silencer, silencer flanges, and flexible stainless steel bellows-type exhaust fittings.
- D. Starting and Control Batteries: Lead-calcium, starting batteries 24 volt DC, sized as recommended by the generator set manufacturer, shall be supplied for the generator set with battery cables and connectors. Batteries shall mount on set using manufacturer's corrosion resistant skid-mounted tray. Provide and install a 10-amp minimum, 24 VDC solid-state automatic battery charger, wall-mounting type, 120 VAC input, 1 phase, 60 Hz input.

- E. Remote Annunciators: Furnish three NFPA 110 Level 1 remote alarm annunciators: one for installation outside the engine-generator room, one to be installed in the existing switchgear, and one for installation at the building fire command center. The remote annunciators shall provide all the indications and audible alarms required by NFPA 110, and in addition shall provide indications for high battery voltage, low battery voltage, normal battery voltage, battery charger malfunction and low natural gas pressure. Alarm silence and lamp test switches shall be provided. One remote annunciator should have a SPDT dry contact suitable for use as a common alarm external interface to the building Johnson Controls Metasys system.
- F. Natural Gas Fuel Line Accessories: The generator set supplier shall furnish the following accessories for contractor installation in the engine fuel supply line within ten feet of the engine fuel intake: primary and secondary gas pressure reducing regulator (pounds to ounces) rated for the source gas pressure; 24 VDC, battery-operated starting solenoid valve; fuel strainer; seamless metal-braided flexible fuel line; and AGA plug type manual shutoff valve.
- G. Remote emergency stop control device: Furnish one break-glass type emergency stop control device assembly for remote mounting. Engine-generator connection point: NEMA 12 junction box with identification nameplate.
- H. Lube oil, coolant, and other engine fluids: Provide initial fluids required for operation of the packaged engine-generator system.

2.05 FACTORY TESTS

- A. Before shipment, factory test the packaged engine-generator system manufactured specifically for this project. Perform tests at rated load and power factor. Include the following tests:
 - 1. Measure insulation resistance.
 - 2. High potential testing.
 - 3. Measure winding resistance.
 - 4. Phase balance, current and voltage.
 - 5. Two-hour full load run.
 - 6. Maximum power.
 - 7. Voltage regulation.
 - 8. Transient and steady state governing.
 - 9. Single-step load pick-up.
 - 10. Start time.
 - 11. Safety shutdowns.

PART 3 - EXECUTION

- 3.01 DELIVERY
 - A. Coordinate with Owner for date and location of the delivery.
- 3.02 TECHNICAL SUPPORT OF DESIGN WORK BY THE OWNER'S CONSULTING ENGINEERS
 - A. Furnish the Owner's consulting engineers with a copy of all required submittals, and other information required for installation engineering.
 - B. Attend one pre-design conference at the project site.
 - C. Provide technical support for the Owner and the Owner's consulting engineers.
- 3.03 TECHNICAL SUPPORT OF INSTALLATION WORK BY THE OWNER'S INSTALLATION CONTRACTORS
 - A. Attend one pre-installation conference at the project site.
 - B. Provide technical support for the Owner and the Owner's installation contractors.
 - C. Provide one pre-start-up inspection and provide a written report of observed installation deficiencies. Provide a follow-up inspection for verification that deficiencies were corrected and provide a written report.
 - D. Provide technical support during start-up and field testing.
- 3.04 FIELD ASSEMBLY AND SET-UP
 - A. Make cooling system connections and adjustments.
 - B. Install engine-generator fluids and perform other engine-generator set-up work required for testing and start-up.
- 3.05 START-UP
 - A. Provide manufacturer-recommended start-up service.
- 3.06 CLOSE-OUT, OPERATIONS AND MAINTENANCE INSTRUCTIONS
 - A. Provide four hours training by a service engineer to the Owner's operations and maintenance personnel to adjust, operate, and maintain the packaged engine-generator system.
 - B. Provide Operations and Maintenance Manuals. Include start-up service reports.
- 3.07 FIELD TESTS
 - A. General:
 - Perform field tests at the site after installation is complete and in the presence of the Owner's Representative. Notify Owner's Representative 15 working days before each test.

- 2. Manufacturer's Representative: Have the engine generator manufacturer furnish a representative to operate the unit during the field tests, to check all details of the installation, and to instruct the operators. Include the services of the representative at no additional cost to the Owner.
- 3. Preparation for Testing: Have the engine generator system completed and ready for operation at the time field tests are to be run. Fill fuel tanks provide all necessary lube oil, coolant, and other fluids, and install new, unused oil and air filter elements.
- 4. Instruments: Provide all instruments necessary to conduct the tests.
- 5. Design, Specification, and NFPA 110 Parameters: For each recorded parameter, provide a written tabulation of the manufacturer's published range of permissible operating values and design parameters. Tabulation shall also include parameters specified by this section, and parameters required in accordance with field testing per NFPA 110.
- 6. Provide load bank and all cabling and connections necessary for testing.
- B. Installation Test: Perform on-site installation test in accordance with NFPA 110, section 5-13.2.3, in the presence of the Owner's Representative.
- C. Full Load Test: Perform full load test in accordance with NFPA 110, sections 5-13.2.4, 5-13.2.5, 5-13.2.6, and 5-13.2.7, in the presence of the Owner's Representative.
- D. Crank Cycle Test: Perform crank cycle test in accordance with NFPA 110, section 5-13.2.8, in the presence of the Owner's Representative.
- E. 6-Hour Test:
 - 1. Complete a 6-hour, full-load test using load bank as a condition for final acceptance.
 - 2. The 6-hour full load test may be performed in conjunction with or as an extension of the NFPA 110 Full Load Test specified in paragraph 3.3C of this section.
 - 3. Read and record all gauges and meters before starting the test, then every 5 minutes during the first 15 minutes, then every 15 minutes during the next 2 hours, and then every half hour during remainder of the 6-hour period.
 - 4. Remove load and run engine generator at no load for 15 minutes; then shut unit down and immediately make one last recording of all gauge and meter indications.
 - 5. Remove load bank and restore all electrical connections.
 - 6. Have recordings field witnessed during test by the Owner.
 - 7. Deliver copies of witnessed recordings to the Engineer and the Owner's Representative within one week of the test. Deliver two copies to the Engineer and six copies to the Owner's Representative.
- F. Actual Load Tests:

- After successful completion of the 6-hour, full-load test described above, make additional on-site tests using actual available loads in the presence of the Owner's Representative to demonstrate satisfactory performance of the complete engine generator system. Include different sequenced start-ups of the various specified loads, as directed by the Owner's Representative.
- 2. After all other tests have been successfully completed; operate each engine generator system under actual available loads for 4 hours of successful operation.
- G. After final testing, refill fuel tanks. Verify that coolant and lubricant are at satisfactory levels, fill as required.

END OF SECTION 26 32 14



GENERAL NOTES

- A. THE OWNER'S SECURITY CONTRACTOR WILL INSTALL ALL SECURITY DEVICES & SECURITY CABLING. DEVICES INCLUDE CAMERAS, PULL STATIONS, CARD READERS, DURESS/PANIC BUTTONS/DOOR CONTACTS/INTERCOM & LAP.
- GENERAL CONTRACTOR TO COORDINATE WORK BY SECURITY CONTRACTOR.
- ELECTRICAL CONTRACTOR TO PROVIDE ALL PATHWAYS AND INFRASTRUCTURE TO SUPPORT SECURITY DEVICES.
- ALL CABLING AND PATHWAY COMPONENTS TO BE CONCEALED WITHIN PARTITIONS, ABOVE CEILING AND FURRDOWNS. PATCH / REPAIR PARTITIONS AS REQUIRED FOLLOWOING CABLING INSTALLATION.
- ALL HARDWARE AND SECURITY DEVICE DEMOLITION / INSTALLATION TO BE PERFORMED BY A VETTED SECURITY CONTRACTOR TO UTPH TECH SERVICES.
- G.C. TO CONFIRM WITH OWNER'S SECURITY CONTRACTOR MOUNTING HEIGHTS & LOCATIONS OF ALL CAMERAS PRIOR TO ROUGH IN INSTALLATION. ELECTRICAL
- A. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL MATERIALS & LABOR TO PROVIDE A COMPLETE SECURITY CABLING PATHWAY CONCEALED WITHIN PARTITIONS & CEILINGS, ELECTRICAL POWER DISTRIBUTION & GROUND SYSTEM AS SET FORTH IN THE DOCUMENTS. ALL NEW SECURITY DEVICES WILL REQUIRE NEW CABLES & ROUGH IN PATHWAYS.
- B. ALL COMPONENT & DEVICES SHOWN ON THESE DRAWINGS ARE FOR APPROXIMATE LOCATION & POSITIONING ONLY. VERIFY WITH OWNER EXACT LOCATIONS PRIOR TO INSTALLATION.
- C. ELECTRICAL CONTRACTOR SHALL INSTALL NORMAL POWER AS REQUIRED BY THE SECURITY SYSTEM & COORDINATED BY THE SECURITY CONTRACTOR.
- D. ELECTRICAL CONTRCTOR SHALL PROIVDE 120V AC FOR ELECTRICAL SECURITY POWER SUPPLIES & CAMERA POWER SUPPLIES.
- ELECTRICAL CONTRACTOR SHALL PROVIDE & INSTALL ALL CONDUITS, PULL STRINGS, CORES & JUNCTION BOXES AS REQUIRED FOR SECURITY DEVICE INSTALLATION. ALL PATHWAYS PENETRATING EXTERIOR WALLS WILL BE MADE WATERTIGHT.
- ALL SECURITY PATHWAY CONDUITS & UNUSED SECURITY CONDUITS SHALL BE PROPOERLY FIRESTOPPED & LABELED.
- PROVIDE CONDUIT FOR SECURITY DEVICES THAT ARE IN OPEN CEILING SPACES TO ACCESSIBLE CEILING.



ROOM LOCATION	CAMERA NUMBER	MOUNT TYPE	MOUNT HEIGHT	REMARKS
ENTRY ERELIØØ	C-Ø1	CLG, MTD	10'-0"AFF	BASE COVERAGE, FIXED VIEW, FINISH CLG, IS ACT.
SOUTH EXTERIOR	C-Ø2	WALL MTD	12'-Ø"AFF	270 DEGREE COVERAGE. PROVIDE MOUNTING BRACKET.
SOUTH EXTERIOR	C-Ø3	SOFFIT MTD	12'-Ø"AFF	270 DEGREE COVERAGE, PROVIDE MOUNTING BRACKET, PLASTER SOFFIT.
CORRIDOR EREI.300	C-Ø4	CLG. MTD	10'-0"AFF	BASE COVERAGE, FIXED VIEW, FINISH CLG, IS ACT.
NORTH EXTERIOR	C-Ø5	WALL MTD	12'-Ø"AFF	270 DEGREE COVERAGE, PROVIDE MOUNTING BRACKET,
NORTH EXTERIOR	C-Ø6	WALL MTD	12'-Ø"AFF	270 DEGREE COVERAGE, PROVIDE MOUNTING BRACKET,
SOUTH EXTERIOR	C-Ø7	SOFFIT MTD	12'-Ø"AFF	BASE COVERAGE, FIXED VIEW, PLASTER SOFFIT,
SOUTH EXTERIOR	C-Ø8	WALL MTD	12'-Ø"AFF	210 DEGREE COVERAGE. PENDANT & MOUNTING BRACKET.
NORTH EXTERIOR	C-Ø9	WALL MTD	12'-Ø"AFF	180 DEGREE COVERAGE, PROVIDE MOUNTING BRACKET,
NORTH EXTERIOR	C-10	WALL MTD	12'-Ø"AFF	210 DEGREE COVERAGE, PROVIDE MOUNTING BRACKET,
SOUTH EXTERIOR	C-11	SOFFIT MTD	12'-Ø"AFF	BASE COVERAGE, FIXED VIEW, PLASTER SOFFIT,
NORTH EXTERIOR	C-12	WALL MTD	12'-Ø"AFF	BASE COVERAGE. FIXED VIEW.



SECURITY DEVICES		MODEL	REMARKS				
	PS POLICE PULL STATION			RECESSED. 1			
	PB	PANIC BUTTON					
	CR	CARD READER					
	INTERCOM	OM					
	DC	ALARMED DOOR CONTACTS					



