



DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY AND TRANSPORTATION

PUBLIC WORKS SOLID WASTE DIVISION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713

**REQUEST FOR PROPOSALS NO. 314012
GAS ENGINE - GENSET FUEL BLENDING CONTROL SYSTEM
DANE COUNTY SANITARY LANDFILL SITE #1
6718 EAST VERONA AVENUE
VERONA, WISCONSIN**

Due Date / Time: **THURSDAY, MAY 15, 2014 / 2:00 P.M.**

Location: **PUBLIC WORKS OFFICE**

Performance / Payment Bond: **100% OF CONTRACT AMOUNT**

Bid Deposit: **N/A**

FOR INFORMATION ON THIS REQUEST FOR PROPOSALS, PLEASE CONTACT:

MIKE RUIPER, SPECIAL PROJECTS MANAGER
TELEPHONE NO.: 608/266-4990
FAX NO.: 608/267-1533
E-MAIL: RUPIPER.MICHAEL@COUNTYOFDANE.COM



County Executive
Joseph T. Parisi

DANE COUNTY DEPARTMENT of PUBLIC WORKS, HIGHWAY and TRANSPORTATION

1919 Alliant Energy Center Way ♦ Madison, Wisconsin 53713
Phone: (608) 266-4018 ♦ Fax: (608) 267-1533

Commissioner / Director
Gerald J. Mandli

April 24, 2014

INVITATION FOR PROPOSALS

You are invited to submit a Proposal for RFP No. 314012 to provide professional design and construction services for a Gas Engine - Genset Fuel Blending Control System at the Dane County Landfill Site #1 in Verona, WI. The Proposals are due on or before **2:00 p.m., Thursday, May 15, 2014**. A performance bond is required for this project.

SPECIAL INSTRUCTIONS

Please be sure to complete one unbound original and four bound copies of the entire proposal package. To return your proposal, please follow these instructions:

1. Place the signed Signature Page on top as page 1.
2. Place the signed Fair Labor Practices Certification after the Signature Page as page 2.
2. Place the Proposal information after Fair Labor Practices Certification.
3. Clearly label your envelope containing your proposal in the lower left-hand corner as follows:
"Proposal No. 314012
Gas Engine - Genset Fuel Blending Control System
2:00 p.m., Thursday, May 15, 2014"
4. Mail to:
Mike Rupiper, Special Projects Manager
Dane County Department of Public Works, Highway & Transportation
1919 Alliant Energy Center Way
Madison, Wisconsin 53713

If any additional information about this Request for Proposals is needed, please call Mike Rupiper at (608) 266-4990 or send email to rupiper.michael@countyofdane.com.

Sincerely,

Mike Rupiper

Special Projects Manager

Encl.: Request for Proposals No. 314012 Package

DOCUMENT INDEX FOR RFP NO. 314012

PROPOSAL REQUIREMENTS

- RFP Cover
- RFP Cover Letter
- Documents Index
- Invitation to Propose (Legal Notice)
- Signature Page and Additional Dane County Requirements
- Fair Labor Practices Certification
- Equal Benefits Compliance Payment Certification
- Requested Services and Business Information

APPENDICES

Appendix A	Manufacturer's Specifications for Engines
Appendix B	Site Plan

LEGAL NOTICE

INVITATION TO PROPOSE

Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, will receive sealed Proposals until:

2:00 P.M., THURSDAY, MAY 15, 2014

REQUEST FOR PROPOSALS NO. 314012

GAS ENGINE - GENSET FUEL BLENDING CONTROL SYSTEM

DANE COUNTY SANITARY LANDFILL SITE #1

6718 EAST VERONA AVENUE

VERONA, WISCONSIN

Dane County is inviting Proposals for design and construction services for a Gas Engine - Genset Fuel Blending Control System at Dane County Landfill Site #1 in Verona, WI. The project consists of providing supplemental natural gas to engines currently fueled by landfill gas. The scope of work for the project includes the design, purchase and installation of equipment and instrumentation, natural gas supply connection, smart metering, start-up testing, and troubleshooting necessary to successfully implement the project.

Request for Proposals package may be obtained by downloading it from countyofdane.com/pwbids. Please call Mike Rupiper, Special Projects Manager, at 608/266-4990, with any questions or for additional information.

All Proposers must be a registered vendor with Dane County & pay an annual registration fee before award of Contract. Complete Vendor Registration Form at danepurchasing.com/registration or obtain one by calling 608/266-4131.

PUBLISH: APRIL 24 & MAY 1, 2014 - WISCONSIN STATE JOURNAL

APRIL 24 & MAY 1, 2014 - THE DAILY REPORTER



SIGNATURE PAGE

County of Dane
 DEPARTMENT OF ADMINISTRATION
PURCHASING DIVISION
 Room 425, City-County Building
 210 Martin Luther King, Jr. Blvd.
 Madison, Wisconsin 53703
 (608) 266-4131

COMMODITY / SERVICE: GAS ENGINE - GENSET FUEL BLENDING CONTROL SYSTEM			
REQUEST FOR PROPOSAL NO.: 314012	PROPOSAL DUE DATE: 05/15/14	BID BOND: N/A	PERFORMANCE BOND: 100%
PROPOSAL INVALID WITHOUT SIGNATURE			
THE UNDERSIGNED, SUBMITTING THIS PROPOSAL, HEREBY AGREES WITH ALL TERMS, CONDITIONS AND REQUIREMENTS OF THE ABOVE REFERENCED REQUEST FOR PROPOSAL, AND DECLARES THAT THE ATTACHED PROPOSAL AND PRICING ARE IN CONFORMITY THEREWITH.			
SIGNATURE OF PROPOSER REQUIRED: (Do Not Type or Print)		DATE:	
SUBMITTED BY: (Typed Name)		TELEPHONE: (Include Area Code)	
COMPANY NAME:			
ADDRESS: (Street, City, State, Zip Code)			

CONTRACT COMPLIANCE PROGRAM WORKSHEET

- A. Dane County has an established Contract Compliance Program that encourages targeted groups identified below to do business with Dane County, and requires Dane County to actively solicit bids from these businesses.
- B. Information from your response to this worksheet will be entered in the Purchasing Division's Advanced Procurement Systems database to provide data that will be valuable to Dane County's Contract Compliance Program as well as establishing computerized bidder lists for future solicitations. All vendors will be added to the database whether or not they qualify as a targeted business.
- C. **Contract Compliance Program:** Following are abbreviated definitions of ethnic and group codes used by Contract Compliance Program. See reverse side for full definitions:
 - 1. DBE Disadvantaged Business Enterprise
 - 2. MBE Minority Business Enterprise
 - 3. WBE Women Business Enterprise
 - 4. ESB Emerging Small Business
- D. Please select category / categories that best describe your business by marking letter for each column in box provided at bottom of column:

<input type="checkbox"/> D	DBE	<input type="checkbox"/> B	African American	<input type="checkbox"/> L	Male	<input type="checkbox"/> E	ESB
<input type="checkbox"/> M	MBE	<input type="checkbox"/> H	Hispanic American	<input type="checkbox"/> F	Female		
<input type="checkbox"/> W	WBE	<input type="checkbox"/> N	Native American / American Indian				
		<input type="checkbox"/> A	Asian Pacific American				
		<input type="checkbox"/> I	Asian-Indian American				
↓		↓		↓		↓	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	

- E. I hereby certify that all of the above information given is true. If no category / categories are marked, I do not meet the requirements for any of the targeted groups.

Signature: _____ Date: _____

(over)

DANE COUNTY CONTRACT COMPLIANCE PROGRAM DEFINITIONS

- A. **Disadvantaged Business Enterprise (DBE):** A small business concern:
1. Which is at least fifty-one percent (51%) owned by one or more socially and economically disadvantaged individuals, or in the case of any publicly owned business, at least fifty-one percent (51%) of the stock of which is owned by one or more socially and economically disadvantaged individuals; and
 2. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it.
 3. Socially and Economically Disadvantaged Individuals:
 - a) Any person having a current Section 8 (a) Certification from the Small Business Administration is considered socially and economically disadvantaged.
 - b) Individuals who are citizens of the United States (of lawfully permanent residents) are socially and economically disadvantaged:
 - 1) Women;
 - 2) Black Americans, which includes persons having origins in any of the black racial groups of Africa;
 - 3) Hispanic Americans, which includes persons of Mexican, Puerto Rican, Cuban, Central, or South American, or other Spanish or Portuguese culture or origin, regardless of race;
 - 4) Native Americans, which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians;
 - 5) Asian-Pacific Americans, which includes persons whose origins are from Burma, Thailand, Malaysian, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia, the Philippines, Samoa, Guam, the U.S. Trust territories of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, or the Commonwealth of the Northern Mariana Islands; and
 - 6) Asian-Indian Americans, which includes persons who origins are from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal.
- B. **Minority Business Enterprise (MBE):** A minority person(s) owned and controlled independent and valid business concern. A minority person(s) must own fifty-one percent (51%) of the business and must control the management daily operation of the business.
- C. **Women Owned Enterprise (WBE):** A woman or women owned and controlled independent and valid business concern. A woman or women must own fifty-one percent (51%) of the business and. must control the management daily operation of the business.
- D. **Emerging Small Business (ESB):**
1. An independent business concern that has been in business for at least one (1) year.
 2. Business is located in the State of Wisconsin.
 3. Business is comprised of less than twenty-five (25) employees.
 4. Business must not have gross sales in excess of three million over the past three (3) years.
 5. Business does not have a history of failing to complete projects.

THIS PAGE IS FOR PROPOSERS' REFERENCE AND NEED NOT BE SUBMITTED WITH PROPOSAL.

PROPOSERS SHOULD BE AWARE OF THE FOLLOWING:

DANE COUNTY VENDOR REGISTRATION PROGRAM

Any person proposing on any County contract must be registered with the Dane County Purchasing Division & pay an annual registration fee. A contract will not be awarded to an unregistered vendor. Complete a Vendor Registration Form at:
www.danepurchasing.com/registration
or obtain one by calling 608/266-4131.

EQUAL BENEFITS REQUIREMENT

By submitting a Proposal, the contractor / consultant acknowledges that a condition of this contract is to provide equal benefits as required by Dane County Code of Ordinances Chapter 25.016. Contractor / Consultant shall provide equal benefits as required by that Ordinance to all required employees during the term of the contract. For more information: www.danepurchasing.com/partner_benefit.aspx

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

- A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a proposal, bid or application for a contract with the county of Dane.

- B. That BIDDER, APPLICANT or PROPOSER has (check one):

_____ not been found by the National Labor Relations Board (“NLRB”) or the Wisconsin Employment Relations Commission (“WERC”) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ been found by the National Labor Relations Board (“NLRB”) or the Wisconsin Employment Relations Commission (“WERC”) to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

Officer or Authorized Agent Signature _____
Date

Printed or Typed Name and Title

Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlr.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.11(28)(a) is as follows:

(28) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The purchasing manager shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder’s responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

EQUAL BENEFITS COMPLIANCE PAYMENT CERTIFICATION

PURPOSE

25.016(8) of the Dane County Ordinance requires that each contractor receiving payment for contracted services must certify that he or she has complied fully with the requirements of Chapter 25.016 "Equal Benefits Requirement" of the Dane County Ordinances. Such certification must be submitted prior to the final payment on the contract.

This form should be included with a copy of the final contract invoice forwarded to your contract representative at Dane County.

CERTIFICATION

I, _____ certify that
Printed or Typed Name and Title

Printed or Typed Name of Contractor

has complied fully with the requirements of Chapter 25.016 of the Dane County Ordinances "Equal Benefits Requirements".

Signed _____

Date _____

For questions on this form, please contact Chuck Hicklin at 608-266-4109 or your contract representative at Dane County.

REQUESTED SERVICES AND BUSINESS INFORMATION

1. GENERAL BACKGROUND INFORMATION

- A. Dane County is inviting proposals for design and construction services for a Gas Engine - Genset Fuel Blending Control System at Dane County Landfill Site #1 in Verona, WI.
- B. Dane County Landfill Site #1 accepted a total of about 1,283,000 tons of municipal solid waste from 1977 to 1986. A landfill gas to energy system was installed at the site in 1995. This system includes a CAT 3412 NA (naturally aspirated) gas engine and a CAT 3412 TA (turbocharged / aftercooled) gas engine equipped to use landfill gas as fuel. The manufacturer’s specifications for the engines are included in Attachment A. The engines power Marathon Electric MagnaMax generators with typical outputs of 175kW and 330 kW, respectively. Due to decreases in the gas production of the landfill, current system operation is generally to run only the 3412 TA engine and to occasionally run the 3412 NA engine alone or in combination with the 3412 TA engine. Engine operating times in 2013 were 6,668 hours for the 3412 TA and 2,579 hours for the 3412 NA. The amount of landfill gas available to fuel the engines is typically 135 SCFM at 50% methane. The available landfill gas is expected to continue decreasing at a rate of about 5 SCFM per year. Other components of the current landfill gas to energy system include:
- Woodward 2301A Electronic Load Sharing & Speed Controls
 - Marathon DVR 2000 EC Digital Regulators
 - ABB Kent Taylor Commander 200 Process Controllers
 - AC Tech Variable Speed AC Motor Drives
 - GE 20 HP AC Motors
 - Rotron Inc CP 606 Blowers
- C. The electrical power generated by the facility is primarily used by three nearby Dane County facilities; (Consolidated Food Service, new Badger Prairie Health Care Center, & old Badger Prairie Health Care Center). A site map is included in Attachment B. Monthly electrical usage by these facilities over the past 2 years is shown in Table 1. When surplus electricity is generated it is sold to the local utility - Alliant Energy. Electricity sales to the utility have ranged from 0 to 40,800 kWh per month and averaged 18,800 kWh per month. When additional electricity is needed by the facilities it is purchased from the utility. Electricity purchases from the utility have ranged from 11,100 to 183,300 kWh per month and averaged to 54,500 kWh per month.

Table 1: Monthly Electricity Use

Facility	(kWh / month)	
	Range	Average
Consolidate Food Service	26,400 – 120,600	44,900
Badger Prairie Health Care Center – new building	154,400 – 237,700	183,500
Badger Prairie Health Care Center – old building	3,700 – 12,600	7,900
LFG to Energy Facility	640 – 22,000	8,600
Combined Facilities	199,400 – 325,900	245,000

- D. A natural gas supply line is located near the flare at the site, approximately 40 feet from the engines. Natural gas service is provided by Madison Gas & Electric.

- E. All three Dane County facilities are on the same network with separate IP addresses, which can be used for smart metering. A wireless VLAN that would have a different addressing, but is also in the DC Domain is also available.

2. SCOPE OF WORK

- A. The scope of work for the project shall include all of the design, purchase and installation of equipment and instrumentation, natural gas supply connection, smart metering, start-up testing and troubleshooting, etc., necessary to successfully implement the project. Dane County will be responsible for obtaining any permits that are required.

B. Design

1. The selected Proposer will be required to familiarize themselves with the site, current operations, and current controls in order to properly design the fuel blending control system.
2. The system design shall be based on the following desired operating criteria:
 - a. The engines shall use the available landfill gas first as the primary fuel and a supplemental natural gas / air mixture secondarily.
 - b. Smart metering shall be used to vary the amount of supplemental natural gas / air mixture used to match the electrical demand of the three Dane County facilities that use the power generated and the parasitic load of the landfill gas to energy system.
 - c. The Btu value of the fuel mixture to the engines should not exceed 600 Btu / cf.
 - d. The system shall be able to monitor and record the amount of each fuel type (landfill gas and natural gas) used in each engine.
3. The selected Proposer will be required to meet with Dane County to review and discuss the conceptual design. The conceptual design shall include:
 - a. A proposed site layout with the location of the new natural gas line and important site features that will be affected.
 - b. An overview of the controls and equipment needed to operate and monitor the engines with the supplemental natural gas fuel and how the controls for each piece of equipment in the system are integrated. This shall include a thorough description of the control system's compatibility with the current generation facility controls, including the current SCADA system.
4. Prepare a design report consisting of text, design drawings, manufacturer's equipment specifications, and other documents that detail the final design of the system.

C. Equipment Purchase and Installation

1. The selected Proposer will be responsible for the purchase, delivery, and installation of all equipment and instrumentation necessary for the project.
2. All equipment sold to Dane County must meet Federal, State and local government standards. A proposal will not be considered if the proposer has failed to show, without a doubt, that the proposal is for regularly manufactured equipment, tried, proven and in current use.

D. Operation & Maintenance Manual

1. Prepare an operation and maintenance manual for the system consisting of text, drawings, manufacturer's equipment specifications, and other documents that describe the steps for operating the system and maintenance requirements of the system.

E. Start-up Testing, Training, and Troubleshooting

1. Field Quality Control: An authorized field representative shall inspect, test, and adjust field assembled components and equipment installation including connections and control system programming modifications, as necessary, and supervise field test performance. The manufacturer's representative shall issue an installation certificate to Dane County confirming that all equipment has been installed in accordance with manufacturer's recommendations.
2. Field Testing: An authorized field representative shall perform a full load test of the entire system, using available landfill gas with supplemental natural gas, for 7 consecutive days with no shutdowns. A test report shall be prepared and submitted to Dane County.

F. Project Acceptance and Warranty

1. Dane County will accept the project when the system has run as designed, using available landfill gas with supplemental natural gas, for a period of 7 consecutive days with no shutdowns.
2. The system shall be provided with a warranty for all equipment, parts, and labor for 1 year from project acceptance. The warranty certificate shall be made available and signed by an officer of the Proposer's company.

3. PROPOSAL CONTENT

A. Proposers are requested to submit the following information in their proposal, in seven distinct sections or divisions:

1. Proposer's cover letter, Signature Page and Fair Labor Practices Certification.
2. Description of Proposer's qualifications, related experience, organization and resources. This description must pay specific attention to the design, installation, and start-up of fuel blending control systems.
3. Listing of three to five projects completed by the Proposer that are similar to the one being proposed. Listing shall include for each project:
 - a. Brief description of the project including services provided;
 - a. Detail the proposing company's role(s) in the project;
 - b. Project references (name of the organization, contact person or responsible official, address, telephone and fax numbers, e-mail address);
 - c. Start and end dates of services; and
 - d. Specific details of originally proposed project budget and time of completion and final (actual) project budget and time of completion.

You may separately list additional professional references.

4. Description of the approach to the design, installation, and start-up of the project. Include a complete list of the individual equipment components with product literature

from the manufacturer for key components. Close attention will be paid to the Proposer's knowledge and understanding of:

- a. Fuel blending control systems;
 - b. Landfill gas to energy systems;
 - c. Spark-ignited reciprocating internal combustion gas engines;
 - d. Grid-tied electrical generators;
 - e. Smart electrical metering systems; and
 - f. State and federal statutes, regulations and codes for the same
5. List of staff that will be committed to the project with their professional resumes. These key staff shall retain project involvement and oversight throughout the course of the project. Include listing of other firms who may participate in this project and their area of expertise.
6. Proposed schedule with all project tasks for the project, including the conceptual design, final design, installation, and start-up phases.
7. Complete system costs including all of the design, equipment purchase and installation, natural gas supply connection, smart metering, start-up testing and troubleshooting, etc., necessary to successfully implement the project. The pricing listed in the proposal for the project shall include the following two alternatives:
- a. Fuel blending control for supplemental natural gas for the 3412 TA engine only;
 - b. Fuel blending control for supplemental natural gas for both the 3412 TA engine and the 3412 NA engine

For each alternative listed above, the cost shall be broken down into the following project tasks / phases:

- a. Design and project management;
- b. Installation (including all equipment costs)
- c. Operation and maintenance manual
- d. Start-up testing, training, and troubleshooting
- e. One year warranty

4. EVALUATION CRITERIA

A. Proposals will be evaluated, scored, and ranked according to the following criteria:

Approach to Project	40%
Pricing / Cost Proposal	30%
Past Project References	20%
<u>Project Personnel</u>	<u>10%</u>
Total	100%

5. SITE / FACILITY TOUR

- A. A site / facility tour will be held on May 5, 2014 at 10:00 a.m. at the Dane County Landfill Site #1, 6718 East Verona Avenue, Verona, Wisconsin, starting at the landfill gas to energy facility. This cursory tour will go until approximately 12:00 noon. Proposing companies are encouraged to attend this tour, however attendance is optional.

6. OWNER'S RESPONSIBILITY

- A. Dane County will provide all necessary and available site information to the selected proposer.
- B. Dane County will be responsible for obtaining any WDNR Air Permit modifications and any other permits required for the project.

7. TIMETABLE

- A. Listed below are specific and estimated dates and times of events related to this RFP. The events with specific dates must be completed as indicated unless otherwise changed by Dane County. In the event that Dane County finds it necessary to change any of the specific dates and times in the calendar of events listed below, it will do so by issuing an addendum to this RFP. There may or may not be a formal notification issued for changes in the estimated dates and times.

<u>DATE</u>	<u>EVENT</u>
April 24, 2014	RFP issued
May 5, 2014 - 10:00 a.m.	Site / Facility tour
May 7, 2014	Written inquiries due
May 12, 2014	Last Addendum (if necessary)
May 15, 2014 - 2:00 p.m.	Proposals due
May 29, 2014 (estimated)	Submit additional information (if necessary)
June 12, 2014 (estimated)	Contract and terms of sale negotiated
July 22, 2014 (estimated)	Contract start date

8. ADDITIONAL INFORMATION

- A. Dane County Department of Public Works, Highway & Transportation, 1919 Alliant Energy Center Way, Madison, Wisconsin 53713, will receive your Proposal.
- B. To obtain additional information regarding this project, submit all questions in writing by May 7, 2014 to Mike Rupiper, Special Projects Manager, at rupiper.michael@countyofdane.com. All responses to questions will be posted on the Dane County web site, www.countyofdane.com/pwht/bid/logon.aspx, in the form of Addenda.
- C. Since RFP documents are obtained from the Dane County web site, www.countyofdane.com/pwht/bid/logon.aspx, proposing company is responsible to check back there regularly for Addenda.
- D. All Proposals must be submitted by 2:00 p.m., Thursday, May 15, 2014.
- E. Dane County reserves the right to accept or reject any Proposal submitted. Those who submit proposals agree to do so without recourse against Dane County for either rejection or failure to execute a contract for any reason.
- F. To be considered for this project, the Proposer must meet or exceed the following criteria:
 - 1. Have been in business for a period of not less than three (3) years.

2. Must have successfully completed the design and installation of at least three (3) projects of similar scope and size.
 3. Consideration will be given to joint ventures consisting of two or more firms organized for the purpose of furnishing professional services as a single entity, providing the assignment of and provisions for continuity of the various responsibilities within the joint venture are approved by the County, and further providing that either of the individual firms constituting the joint venture meets the eligibility requirements listed above.
- G. Dane County reserves the right to negotiate an Agreement after the successful firm is selected. Selection will be based only on the proposal submitted and any additional information requested. Therefore, the proposals must be complete. Submission of a proposal shall constitute a valid offer, which may be accepted by the County for a period of ninety (90) days following the proposal due date.
- H. The selected Proposer will be required to post a performance bond equal to the value of the equipment, installation, and startup costs.
- I. Dane County is an Equal Opportunity Employer.

Appendix A

Manufacturer's Specifications for Engines



CATERPILLAR

GAS GENERATOR SET

3412

415 kW
130°F

470 kW
90°F

FEATURES

CAT GENERATOR SETS

Factory Designed . . . assembled . . . tested and delivered to you in a package that is ready to be connected to your fuel and power lines . . . supported 100% by your Caterpillar Dealer.

DIESEL STRENGTH BUILT IN — blocks, crankshafts, heads, liners, and connecting rods are common with Cat Diesel Engines. Gas engine pressures are 40% to 50% lower; Result . . . Extra long life with the economy of the gaseous fuel.

THE CAT GENERATOR

Single-bearing wye connected brushless generator designed to match performance and output characteristics of the Caterpillar Gas Engine that drives it.

EXCLUSIVE CAT REGULATOR

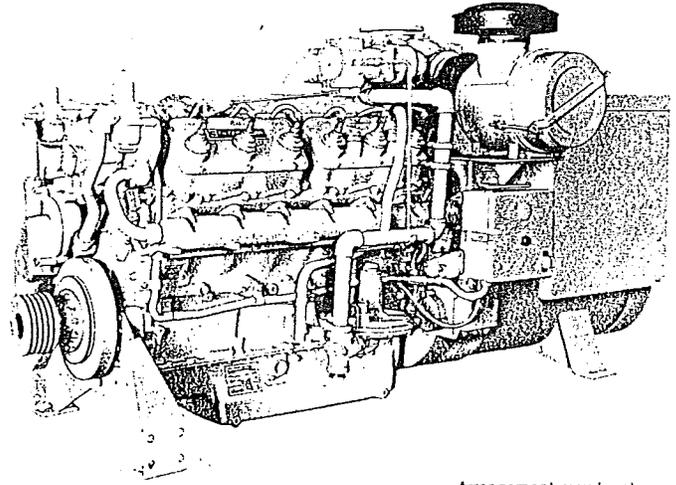
Three phase sensing . . . optimum control precision . . . volts per hertz regulation . . . excellent block loading and constant voltage in the normal operating range.

STANDARD ARRANGEMENT

- Air Cleaner, Two Stage with Rain Cap and Service Indicator
- Carburetor, Natural Gas
- Cooler, Lubricating Oil
- Flywheel and SAE No. 0 Housing
- Governor, Woodward PSG (Mech.)
- Ignition System, Altronic III
- Instrument Panel
 - Gauges — Oil Pressure and Water Temperature
- Magneto Ground Switch (grounds magneto for positive shutdown)
- Manual Shutoff Switch
- Lifting Eyes
- Manifold, Exhaust, Watercooled
- Pumps
 - Auxiliary Water, Gear-Driven, Centrifugal, Non-Self-Priming
 - Jacket Water, Gear-Driven
- Regulator, Gas Pressure
- Service Meter
- Shutoffs
 - Oil Pressure and Water Temperature
- Supports, Engine
- Thermostats and Housing
- Torsional Vibration Damper

OPTIONAL EQUIPMENT

- Cooling Systems
- Fuel Systems
 - Dual Gas Systems
 - Digester Gas Carburetor
- Generator
- Ignition Systems
 - Fairbanks Morse Solid State
- Power Takeoffs
- Protection Devices
 - Alarm Switches (Oil Pressure and Water Temperature)
- Starting Systems
- Shutoffs
 - Overspeed
- Switchgear



Arrangement may be shown with optional equipment.

GENERAL SPECIFICATIONS — 60 Hz

CAT 3412 ENGINE

- 1800 RPM
- Type—Spark Ignited
- Aspiration—
 - Turbocharged-Aftercooled
- Cycle—Four-Stroke
- No. of Cylinders—V-12
- Bore—5.4 in (137 mm)
- Stroke—6.0 in (152 mm)
- Piston Displacement—1649 cu in (27.0 liter)

CAT SR4 GENERATOR

- Frame Size 589/588
- Type—Brushless, Revolving field, Solid-State Exciter
- Construction—Single Bearing—Close Coupled
- Phase—3
- Wire, Connection—10 Wire, Wye
- Meets or exceeds NEMA MG 1-22 & IEC 34/1 std. requirements
- Insulation—Class F with tropicalization & anti-abrasion
- Three Phase Sensing
- Enclosure—Drip Proof
- Alignment—Pilot Shaft
- Overspeed Capability—150%
- Wave Form—Less than 5% deviation
- Voltage Regulator—Generator Mounted, Volts per Hertz
- Voltage Regulation— $\pm 1/2\%$
- Voltage Droop—Adjustable for parallel operation
- Voltage Gain—Adjustable to compensate for engine speed droop and line loss
- THF—less than 3%
- TIF—Less than 50

VOLTAGES AVAILABLE

120/208, 240/416, 139/240, 277/480
(Adjustable a minimum of +10% - 10%)

3412 GAS GENERATOR SET 415-470 kW



60 Hz

415 kW @ 0.8 PF without fan
600 Engine HP without fan

470 kW @ 0.8 PF without fan
675 Engine HP without fan

FUEL RATE DATA

PERCENT LOAD
kW without Fan
ft ³ /HR
m ³ /HR

25	50	75	100
104	208	311	415
1977	3111	4110	5150
56.0	88.0	116.3	145.8

25	50	75	100
118	235	352	470
2274	3365	4462	5632
64.4	95.2	126.3	159.4

TECHNICAL DATA

Rating Information	Rating Type	°C	SI METRIC		°F	ENGLISH	
Information	Compression Ratio		10:1	10:1		10:1	10:1
	Power Rating @ 0.8 PF w/o Fan	kW	415	470	kW	415	470
	Generator Frame Size		588	589		588	589
Cooling System	Engine Coolant Capacity w/o Radiator	L	56.7	56.7	gal	15	15
	Coolant Pump External Resistance (Max. Allowable)	m H ₂ O	6.1	6.1	ft H ₂ O	20.1	20.1
	Coolant Pump Flow @ Max. Allowable Resistance	L/min	681	681	gpm	180	180
Aftercooler Circuit	Coolant Pump External Resistance (Max. Allowable)	m H ₂ O	9.5	9.5	ft H ₂ O	31	31
	Coolant Pump Flow @ Max. Allowable Resistance	L/min	64.3	64.3	gpm	17	17
Exhaust System	System Backpressure (Max. Allowable)	kPa	6.7	6.7	in H ₂ O	27	27
Mounting System (Eng., Gen. & Rad.)	Length Overall	mm	3033	3215	in	119.4	126.6
	Height Overall	mm	1734	1734	in	68.2	68.2
	Width Overall	mm	1492	1492	in	58.7	58.7
	Unit Dry Weight	kg	3560	4150	lb	7850	9150
Performance Data @ Rated Conditions	Combustion Air Inlet Flow Rate	m ³ /min	28	30.2	cfm	990	1070
	Exhaust Gas Flow Rate	m ³ /min	77.5	83.0	cfm	2730	2940
	Exhaust Gas Stack Temperature	°C	550	545	°F	1015	1010
	Heat Rejection to Coolant (Total)	kW	496	527	Btu/min	28,235	29,945
	Heat Rejection to Exhaust (Recoverable)	kW	244	261	Btu/min	13,865	14,845
	Heat Rejection to Atmosphere From Engine	kW	73.7	76.7	Btu/min	4189	4364
	Heat Rejection to Atmosphere From Generator	kW	30.2	32.1	Btu/min	1720	1825

CONDITIONS & DEFINITIONS

High Horsepower turbocharged-aftercooled engines require 32°C (90°F) or lower water temperature to the aftercoolers.

Low Horsepower turbocharged-aftercooled engines require 54°C (130°F) or lower water temperature to the aftercoolers.

Power ratings apply at ambient conditions of 32°C (85°F) and 96 kPa (28.4 in Hg). Ratings also apply at SAE J1349 standard conditions of 100 kPa (29.61 in Hg) and 25°C (77°F) ISO 3046, DIN6271, BS5514. Standard conditions of 100 kPa (29.61 in Hg) 27°C (81°F) and API 7B-11C standard conditions of 100 kPa (29.62 in Hg) and 23°C (60°F) also apply.

Fuel consumption and ratings are based on dry natural gas having an LHV (low heat value) of 905 btu/cu ft (33.74 kJ/L). Variations in altitude, temperature, and gas composition from standard conditions may require a reduction in engine horsepower.

Turbocharged-aftercooled ratings apply to 6,500 ft (1980 m) and 18°C (65°F). For applications which exceed these limits contact your Caterpillar Dealer.

Materials and specifications are subject to change without notice. The International System of Units (SI) is used in this publication.

9.7:1 Compression Ratio	100%	75%	50%	25%
Aspiration	TA	TA	TA	TA
Speed	1800	1800	1800	1800
JW Temperature	210	210	210	210
A/C Temperature	129	129	129	129
Engine Power	600	452	301	150
Generator Output	420	317	210	101
NO _x (as NO ₂)	16.8	15.5	10.6	5.0
CO	1.0	1.0	1.5	2.3
HC (Total)	1.4	1.4	1.3	1.6
HC (Non-Methane)	0.2	0.2	0.2	0.2
Exhaust-Oxygen	1.5	1.4	2.5	2.7
BSFC	7659	8064	8959	11716
Compressor Out Pressure	50.8	47.6	44.4	38.4
Compressor Out Temperature	210	194	180	144
Intake Manifold Pressure	45.5	37.4	29.7	20.7
Intake Manifold Temperature	144	146	149	161
Air-Fuel Ratio	10.4	10.3	10.8	10.9
Timing	20	20	20	20
Input Energy (LHV)	76603	60801	44983	29302
Work	25420	19181	12796	6369
Exhaust (LHV)	18596	13624	9383	5616
Exhaust (to 350°F)	13307	9595	6426	3597
Aftercooler	1120	653	290	-81
Radiation	3401	2831	1899	1313
Jacket Water/Oil Cooler	28036	24332	20473	16129
Air Flow	4005	3165	2447	1612
Air Flow	954	754	583	384
Exhaust Flow	4245	3354	2593	1706
Exhaust Flow	2695	2047	1496	927
Exhaust Stack Temperature	1022	965	886	808
Fuel Flow	5074	4025	2980	1942

Sound Data @ 100% Load	Overall Sound Level db(A)	Sound Level in Linear Decibels [db]							
		Octave Band Center Frequency							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Mechanical Sound @ 1 m	100	89	93	94	96	95	94	78	71
Exhaust Sound @ 1.5 m	106	96	106	107	106	99	97	95	86

9.7:1 Compression Ratio	100%	75%	50%	25%
Aspiration	NA	NA	NA	NA
Speedrpm	1800	1800	1800	1800
JW Temperature.....°F	210	210	210	210
Engine Power.....bhp	365	274	183	90
Generator Output.....ekW	255	190	125	60
NO _x (as NO ₂).....g/bhp-hr	19	18	15	16
CO.....g/bhp-hr	0.5	0.6	0.7	0.8
HC (Total).....g/bhp-hr	1.6	1.9	2.0	2.5
HC (Non-Methane).....g/bhp-hr	0.2	0.3	0.3	0.4
Exhaust-Oxygen.....% (dry)	0.2	0.2	0.2	0.2
BSFC..... Btu/bhp-hr	7833	8467	9767	14140
Intake Manifold Pressure.....in. Hg (abs)	26.8	22.4	18.1	13.6
Intake Manifold Temperature.....°F	102	106	113	133
Air-Fuel Ratio.....vol/vol	10.5	10.5	10.4	9.9
Timing.....°BTDC	30	30	30	30
Input Energy (LHV).....Btu/min	47713	38728	29799	21212
Work.....Btu/min	15468	11630	7748	3810
Exhaust (LHV).....Btu/min	13023	10094	7350	4834
Exhaust (to 350°F).....Btu/min	9895	7564	5445	3526
Radiation.....Btu/min	2895	1703	823	557
Jacket Water/Oil Cooler.....Btu/min	16321	15298	14132	12966
Air Flow.....lb/hr	2483	2001	1506	1023
Air Flow.....(scfm-77°F, 13.9 psia)	591	477	359	244
Exhaust Flow.....lb/hr	2632	2124	1599	1089
Exhaust Flow.....(cfm-stack temp, 14.5 psia)	1818	1428	1055	699
Exhaust Stack Temperature.....°F	1152	1109	1080	1039
Fuel Flow.....(scfh-60°F, 14.7 psia)	3160	2565	1974	1405

Sound Data @ 100% Load	Overall Sound Level db(A)	Sound Level in Linear Decibels [db] Octave Band Center Frequency							
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Mechanical Sound @ 1 m	100	89	93	94	96	95	94	78	71
Exhaust Sound @ 1.5 m	115	114	116	114	106	109	109	107	104

Appendix B

Site Plan



KEY LOCATIONS:

- 1. GAS BLOWER BUILDING
- 2. POWER GENERATION CONTROL BLDG.
- 3. 3412 TA (GEN. 2)
- 4. 3412 NA (GEN. 1)
- 5. NATURAL GAS METER / SUPPLY
- 6. ELECTRIC METER - LFG TO ENERGY
- 7. ELECTRIC METER - NEW BPHCC (INSIDE)
- 8. ELECTRIC METER - FOOD SERVICE
- 9. ELECTRIC METER - OLD BPHCC
- 10. PRIMARY ELECTRIC METER - UTILITY