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CHRISTINA SCHOOL DISTRICT

#CHR20003-MEP2 – Bayard School Mechanical Renovations Phase 2

ADDENDUM No 2

2020/10/02

1.0 NOTICE TO ALL BIDDERS:

1.1. Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.

1.2. The following items are intended to revise and clarify the Contract Documents, and shall be included by the Bidder in their proposal.

1.3. Bidders shall verify that their sub-bidders are in full receipt of the information contained herein. Bidders shall acknowledge receipt of each addendum on their Bid Form.

2.0 CLARIFICATIONS:

2.1 Drawings and specifications provided on the State of Delaware procurement website for advertisement purposes should not be used for bidding. Only the documents issued at the Pre-bid Meeting or purchased directly from F-C Architects should be used for bidding purposes.

2.2 This and all future addenda will be emailed to all planholders at the addresses given on the sign-in sheet.

2.3 Substitution requests must be received no later than 10 days prior to the bid due date. The deadline for substitution requests expired on Tuesday, 29 September 2020.

2.4 Bidder questions must be received no later than 7 days prior to the bid due date. The deadline for questions is currently Thursday, 01 October 2020.

2.5 Bidders are reminded that this project is a General Contract bid. **Bidders must be licensed and experienced General Contractors.** Unless the firm has a demonstrated history of General Contract work, Mechanical Prime Contractor bids will not be accepted even if signed in as a General Contractor at the pre-bid meeting.

3.0 QUESTIONS:

3.1 Q: *Has the new electrical service from Delmarva Power been approved?*

A: The new power service application has been submitted to Delmarva Power. Service includes a new primary to the building. ~~It is believed that the existing mains service at the pole is adequate.~~ **Delmarva Power is anticipating having to set a pole in the vicinity of the existing service pole to accommodate the new drop. This is indicated in the contract documents.**

3.2 Q: *Please clarify the scope of work to be performed by Delmarva Power. They will be providing the transformer and meter, correct? Who provides the electrical service from the pole to the transformer?*

A: The primary feeder is to be provided as part of the contract. Refer to Dwg E4.1.

3.3 Q: *Regarding Drawing Note 1 on drawing E3.2, please confirm that teledata wiring will be by the Owner and not the Contractor.*

A: This work included for the data drop per Drawing Note 1 is part of the contract.

3.4 Q: *Can you please provide more information on the heat trace - manufacturer, make, and model for devices and cable.*

A: It is specified in Specification Section 230600, paragraph 2.4.

3.5 Q: *Please provide contact information for the existing roof installers.*

A: The area over the auditorium (W side of Area A) has an existing ballasted modified bitumen / coal tar pitch roof system with no known warranty. There are two areas of roof with new white EPDM systems installed in 2020 with warranties in force. Installer information for these areas is provided below:

Roof over the mechanical room area (SW corner of Area A – Versico Roofing):
Dezigns Construction Inc.
1833 Glassboro Rd, Williamstown, NJ 08094
(856)-881-1861

Roof over the administration / entry areas (NW and NE corners of Area A – Mule Hide Roofing):
Alpha Omega Construction Group Inc
121 Glenwood Rd, Glenwood Landing NY 11547
(917)-453-0838

4.0 SUBSTITUTIONS:

4.1 The following substitution requests have been rejected:

4.1.1 Reillo boilers.

4.1.2 Grundfos pumps and hydronic components.

5.0 CHANGES TO THE DRAWINGS:

5.1 There are no changes to the drawings at this time.

6.0 CHANGES TO THE PROJECT MANUAL:

6.1 Revisions to Specification Section 263213 Engine Generators:

6.1.1 Revise 2.7.A.1 from "…84 dBA…" to "…85 dBA…".

6.1.2 Delete 2.7.B.2.

6.1.3 Revise 2.8.C to read "If output circuit breaker(s) and/or generator controls are located more than 6'-6" above the finished grade and/or are not readily accessible and with clearances as required by the NEC, provide all necessary work and materials including but not limited to ramps, stairs, and platforms required to achieve compliance with the conditions above. All provisions shall conform to OSHA, state and local safety requirements including but not limited to handrails, markings, signage, and access barriers."

6.1.4 Add 2.11.B to read "Elastomeric Isolator Pads: Oil- and water-resistant elastomer Standard neoprene, arranged in single or multiple layers, molded with a nonslip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment. Provide in lieu of spring isolator pad where recommended by manufacturer."

6.1.5 See following attachments to specification for information only (to be utilized by alternate listed manufacturers for sizing calculations per 2.1.B).

END OF ADDENDUM No 2

Recommended Generator Report - C150D6D

Project - bayard ms

Comments - fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 125.0	**Max. Step kW**	: 154.0 In Step 2	**Cumulative Step kW**	: 224.7
Running kVA	: 144.3	**Max. Step kVA**	: 206.3 In Step 2	**Cumulative Step kVA**	: 287.6
Running PF	: 0.87	**Peak kW**	: None	**Cumulative Peak kW**	: None
Running NLL kVA	: 84.8	**Peak kVA**	: None	**Cumulative Peak kVA**	: None
Alternator kW	: 174.33			**Pct Rated Capacity**	: 83.3

Generator Set Configuration

Alternator	: UCD3J	**Engine**	: QSB7-G5 NR3
BCode	: BB88	**Fuel**	: Diesel
Excitation	: PMG	**Displacement, cu in. (Litre)**	: 408.0(6.7)
Voltage Range	: 220/127V	**Cylinders**	: 6
Number of Leads	: 12	**Altitude Knee, ft(m)**	: 11237(3425)
Reconnectable	: No	**Altitude Slope, % per 1000ft(304.8m)**	: 8
Full Single Phase Output	: No	**Temperature Knee, °F(°C)**	: 104(40)
Increased Motor Starting	: No	**Temperature Slope, % per 18°F(10.0°C)**	: 34
Extended Stack	: No	**Emissions**	: Tier 3
		Cooling Package	: High Ambient

Set Performance / Load Requirements

Running At	: 83.3% Rated Capacity		
Max. Step Voltage Dip, %	: 30	**Max. Allowed Step Voltage Dip**	: 35 In Step 2
Max. Step Frequency Dip, %	: 10	**Max. Allowed Step Frequency Dip**	: 10 In Step 2
Peak Voltage Dip, %	:	**Peak Voltage Dip Limit %**	: 35.0
Peak Frequency Dip, %	:	**Peak Frequency Dip Limit %**	: 10
Site Rated Standby kW/kVA	: 150 / 188	**Running kW**	: 125.0
		Running kVA	: 144.3
Site Rated Max. SkW	: 212	**Effective Step kW**	: 182.0
Max. SkVA	: 920	**Effective Step kVA**	: 287.6
Temp Rise at Full Load, °C	: 120	**Percent Non-Linear Load**	: 62.0
Voltage Distortion	: 4.1	**Voltage Distortion Limit**	: 10
Site Rated Max Step kW Limit	:	**Max Step kW**	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.

Loads Summary Report

Project - bayard ms

Comments - fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Loads Summary List

***Note: Detailed Loads and Step Report available below**

Step No.	Load Name	Quantity	Running		Starting		Peak		Dip Limits, %		VTHD% Limit
			kW	kVA	kW	kVA	kW	kVA	Vdip	Fdip	
Step01	Light Load 1	1	30.0	31.58	30.0	31.58	None	None	35.0	10.0	10.0
Step01	fire alarm	1	8.0	8.89	8.0	8.89	None	None	35.0	10.0	10.0
Step01	jockey pump	1	2.73	3.33	16.83	25.5	None	None	35.0	10.0	0.0
Step Summary			41.0	44.0	55.0	66.0	None	None	35.0	10.0	10.0
Step02	boiler	2	1.75	2.24	11.4	14.25	None	None	35.0	10.0	0.0
Step02	hw pump-6	1	24.87	27.63	24.87	27.63	None	None	35.0	10.0	10.0
Step02	cooler	1	3.0	3.8	20.22	25.27	None	None	35.0	10.0	0.0
Step02	split system	2	1.5	2.03	9.37	12.83	None	None	35.0	10.0	0.0
Step02	security/data	1	15.0	16.67	15.0	16.67	None	None	35.0	10.0	10.0
Step02	recirc pump	3	1.45	1.91	3.42	4.75	None	None	35.0	10.0	0.0
Step02	dom water heater	1	0.52	0.76	4.54	5.9	None	None	35.0	10.0	0.0
Step02	unit heater	1	0.4	0.59	2.64	3.3	None	None	35.0	10.0	0.0
Step02	fan	1	0.78	1.15	6.81	8.85	None	None	35.0	10.0	0.0
Step02	dom water booster pump	1	6.58	7.56	28.14	50.25	None	None	35.0	10.0	0.0
Step Summary			62.0	72.0	154.0	206.0	None	None	35.0	10.0	10.0
Step03	dom water heater	1	0.52	0.76	4.54	5.9	None	None	35.0	10.0	0.0
Step03	boiler	2	1.75	2.24	11.4	14.25	None	None	35.0	10.0	0.0
Step03	split system	2	1.5	2.03	9.37	12.83	None	None	35.0	10.0	0.0
Step03	freezer	1	5.0	6.25	34.13	42.66	None	None	35.0	10.0	0.0
Step03	fan	1	0.78	1.15	6.81	8.85	None	None	35.0	10.0	0.0
Step03	recirc pump	2	1.45	1.91	3.42	4.75	None	None	35.0	10.0	0.0
Step03	dom water booster pump	1	6.58	7.56	28.14	50.25	None	None	35.0	10.0	0.0

Step Summary	22.0	28.0	122.0	171.0	None	None	35.0	10.0	10.0
Project Summary	Running		Max Starting		Cumulative Step		Cumulative Peak		Project VTHD% Limit
	kW	kVA	kW	kVA	kW	kVA	kW	kVA	
	125.0	144.3	154.0	206.3	224.7	287.6	0.0	0.0	10.0

***Note: Detailed Loads and Step Report available below**

Loads and Steps Detail Report

Project - bayard ms

Comments - fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 125.0	**Max. Step kW**	: 154.0 In Step 2	**Cumulative Step kW**	: 224.7
Running kVA	: 144.3	**Max. Step kVA**	: 206.3 In Step 2	**Cumulative Step kVA**	: 287.6
Running PF	: 0.87	**Peak kW**	: None	**Cumulative Peak kW**	: None
Running NLL kVA	: 84.8	**Peak kVA**	: None	**Cumulative Peak kVA**	: None
Alternator kW	: 174.33				

Step1

Calculated Individual Generator Set Step Load Requirements

Running kW	: 41.0	**Starting kW**	: 55.0	**Cumulative Step kW**	: 55.0
Running kVA	: 44.0	**Starting kVA**	: 66.0	**Cumulative Step kVA**	: 66.0
Running Amps	: 53.0	**Starting Non-linear kVA**	: 40.0		
Running Non-linear kVA	: 40.0				
Alternator kW	: 59.19				
Voltage Distortion Limit for step	: 10				

Light Load 1 Three Phase Quantity : 1 In this Step

Category : Light - LED

Running kW	: 30.0	**Starting kW**	: 30.0	**Peak kW**	: None
Running kVA	: 31.58	**Starting kVA**	: 31.58	**Peak kVA**	: None
Running PF	: 0.95	**Starting PF**	: 0.95	**Cyclic**	: No
Running Amps	: 38.03	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Running NLL kVA	: 31.58				
Starting NLL kVA	: 31.58			**Voltage**	: 480
Alternator kW	: 45.26				

fire alarm Three Phase Quantity : 1 In this Step

Category : Battery Charger

Running kW	: 8.0	**Starting kW**	: 8.0	**Peak kW**	: None
Running kVA	: 8.89	**Starting kVA**	: 8.89	**Peak kVA**	: None
Running PF	: 0.9	**Starting PF**	: 0.9	**Cyclic**	: No
Running Amps	: 24.71	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Running NLL kVA	: 8.89				
Starting NLL kVA	: 8.89			**Voltage**	: 208
Alternator kW	: 11.2				

Output kW	: 8.0	**Efficiency (%)**	: 0.9
Rectifier Type	: 6 pulse	**THDI %**	: 26
		THDV %	: 10

jockey pump Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 2.73	**Starting kW**	: 16.83	**Peak kW**	: None
Running kVA	: 3.33	**Starting kVA**	: 25.5	**Peak kVA**	: None
Running PF	: 0.82	**Starting PF**	: 0.66	**Cyclic**	: No
Running Amps	: 4.01	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 2.73			**Voltage**	: 480

Shaft Hp	: 3.0	**Method**	: Across the line
Shaft kW	: 2.24	**Low Inertia**	: No
Efficiency (%)	: 0.82	**LRkVA Factor**	: 8.5
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: K
Load Factor	: 100.0		

Step2

Calculated Individual Generator Set Step Load Requirements

Running kW	: 62.0	**Starting kW**	: 154.0	**Cumulative Step kW**	: 195.0
Running kVA	: 72.0	**Starting kVA**	: 206.0	**Cumulative Step kVA**	: 250.0
Running Amps	: 87.0	**Starting Non-linear kVA**	: 44.0		
Running Non-linear kVA	: 44.0				
Alternator kW	: 92.86				
Voltage Distortion Limit for step	: 10				

boiler Single Phase Quantity : 2 In this Step

Category : Motor

Running kW	: 1.75	**Starting kW**	: 11.4	**Peak kW**	: None
Running kVA	: 2.24	**Starting kVA**	: 14.25	**Peak kVA**	: None
Running PF	: 0.78	**Starting PF**	: 0.8	**Cyclic**	: No
Running Amps	: 8.09	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 1.75			**Voltage**	: 277

Shaft Hp	: 1.5	**Method**	: Capacitor Start, Induction Run
Shaft kW	: 1.12		
Efficiency (%)	: 0.64	**LRkVA Factor**	: 9.5
Design	: Capacitor Start, Induction Run	**LRkVA Code**	: L
Load Factor	: 100.0		

hw pump-6			Three Phase	Quantity	: 1 In this Step
Category	: Motor				
Running kW	: 24.87	**Starting kW**	: 24.87	**Peak kW**	: None
Running kVA	: 27.63	**Starting kVA**	: 27.63	**Peak kVA**	: None
Running PF	: 0.9	**Starting PF**	: 0.9	**Cyclic**	: No
Running Amps	: 33.27	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Running NLL kVA	: 27.63				
Starting NLL kVA	: 27.63			**Voltage**	: 480
Alternator kW	: 49.74				

Shaft Hp	: 30.0	**Type**	: Variable Frequency Drive
Shaft kW	: 22.38	**Ramp Details**	: None
Rectifier Type	: 6 pulse	**THDI %**	: 26
Efficiency (%)	: 0.9	**THDV %**	: 10
Load Factor	: 100.0		

cooler			Single Phase	Quantity	: 1 In this Step
Category	: AC				
Running kW	: 3.0	**Starting kW**	: 20.22	**Peak kW**	: None
Running kVA	: 3.8	**Starting kVA**	: 25.27	**Peak kVA**	: None
Running PF	: 0.79	**Starting PF**	: 0.8	**Cyclic**	: No
Running Amps	: 18.27	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 3.0			**Voltage**	: 208

AC Tons	: 3.0	**Method**	: Capacitor Start, Induction Run
EER per Ton	: 12.0	**LRkVA Factor**	: 9.5
		LRkVA Code	: L

split system			Three Phase	Quantity	: 2 In this Step
Category	: AC				
Running kW	: 1.5	**Starting kW**	: 9.37	**Peak kW**	: None
Running kVA	: 2.03	**Starting kVA**	: 12.83	**Peak kVA**	: None
Running PF	: 0.74	**Starting PF**	: 0.73	**Cyclic**	: No
Running Amps	: 5.64	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 1.5			**Voltage**	: 208

AC Tons	: 1.5	**Method**	: Across the line
		Low Inertia	: No
EER per Ton	: 12.0	**LRkVA Factor**	: 9.5
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: L

security/data			Three Phase	Quantity	: 1 In this Step
Category	: General Receptacle				
Running kW	: 15.0	**Starting kW**	: 15.0	**Peak kW**	: None
Running kVA	: 16.67	**Starting kVA**	: 16.67	**Peak kVA**	: None
Running PF	: 0.9	**Starting PF**	: 0.9	**Cyclic**	: No
Running Amps	: 46.32	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Running NLL kVA	: 16.67				
Starting NLL kVA	: 16.67			**Voltage**	: 208

Alternator kW	: 20.99		
Rectifier Type	: 6 pulse	**THDI %**	: 26
		THDV %	: 10

recirc pump Three Phase Quantity : 3 In this Step

Category : Motor

Running kW	: 1.45	**Starting kW**	: 3.42	**Peak kW**	: None
Running kVA	: 1.91	**Starting kVA**	: 4.75	**Peak kVA**	: None
Running PF	: 0.76	**Starting PF**	: 0.72	**Cyclic**	: No
Running Amps	: 2.3	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 1.45			**Voltage**	: 480

Shaft Hp	: 1.5	**Method**	: Wye-Delta
Shaft kW	: 1.12		
Efficiency (%)	: 0.77	**LRkVA Factor**	: 9.5
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: L
Load Factor	: 100.0		

dom water heater Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 0.52	**Starting kW**	: 4.54	**Peak kW**	: None
Running kVA	: 0.76	**Starting kVA**	: 5.9	**Peak kVA**	: None
Running PF	: 0.68	**Starting PF**	: 0.77	**Cyclic**	: No
Running Amps	: 0.92	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 0.52			**Voltage**	: 480

Shaft Hp	: 0.5	**Method**	: Across the line
Shaft kW	: 0.37	**Low Inertia**	: No
Efficiency (%)	: 0.72	**LRkVA Factor**	: 11.8
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: N
Load Factor	: 100.0		

unit heater Single Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 0.4	**Starting kW**	: 2.64	**Peak kW**	: None
Running kVA	: 0.59	**Starting kVA**	: 3.3	**Peak kVA**	: None
Running PF	: 0.68	**Starting PF**	: 0.8	**Cyclic**	: No
Running Amps	: 2.13	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 0.4			**Voltage**	: 277

Shaft Hp	: 0.25	**Method**	: Capacitor Start, Induction Run
Shaft kW	: 0.19		
Efficiency (%)	: 0.47	**LRkVA Factor**	: 13.2
Design	: Capacitor Start, Induction Run	**LRkVA Code**	: P
Load Factor	: 100.0		

fan Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 0.78	**Starting kW**	: 6.81	**Peak kW**	: None

Running kVA	: 1.15	**Starting kVA**	: 8.85	**Peak kVA**	: None
Running PF	: 0.68	**Starting PF**	: 0.77	**Cyclic**	: No
Running Amps	: 1.38	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 0.78			**Voltage**	: 480

Shaft Hp	: 0.75	**Method**	: Across the line
Shaft kW	: 0.56	**Low Inertia**	: No
Efficiency (%)	: 0.72	**LRkVA Factor**	: 11.8
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: N
Load Factor	: 100.0		

dom water booster pump Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 6.58	**Starting kW**	: 28.14	**Peak kW**	: None
Running kVA	: 7.56	**Starting kVA**	: 50.25	**Peak kVA**	: None
Running PF	: 0.87	**Starting PF**	: 0.56	**Cyclic**	: No
Running Amps	: 9.1	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 6.58			**Voltage**	: 480

Shaft Hp	: 7.5	**Method**	: Across the line
Shaft kW	: 5.59	**Low Inertia**	: No
Efficiency (%)	: 0.85	**LRkVA Factor**	: 6.7
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: H
Load Factor	: 100.0		

Step3

Calculated Individual Generator Set Step Load Requirements

Running kW	: 22.0	**Starting kW**	: 122.0	**Cumulative Step kW**	: 225.0
Running kVA	: 28.0	**Starting kVA**	: 171.0	**Cumulative Step kVA**	: 288.0
Running Amps	: 34.0	**Starting Non-linear kVA**	: 0.0		
Running Non-linear kVA	: 0.0				
Alternator kW	: 22.28				
Voltage Distortion Limit for step	: 10				

dom water heater Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 0.52	**Starting kW**	: 4.54	**Peak kW**	: None
Running kVA	: 0.76	**Starting kVA**	: 5.9	**Peak kVA**	: None
Running PF	: 0.68	**Starting PF**	: 0.77	**Cyclic**	: No
Running Amps	: 0.92	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 0.52			**Voltage**	: 480

Shaft Hp	: 0.5	**Method**	: Across the line
Shaft kW	: 0.37	**Low Inertia**	: No
Efficiency (%)	: 0.72	**LRkVA Factor**	: 11.8
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: N
Load Factor	: 100.0		

boiler Single Phase Quantity : 2 In this Step

Category : Motor

Running kW	: 1.75	**Starting kW**	: 11.4	**Peak kW**	: None
Running kVA	: 2.24	**Starting kVA**	: 14.25	**Peak kVA**	: None
Running PF	: 0.78	**Starting PF**	: 0.8	**Cyclic**	: No
Running Amps	: 8.09	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 1.75			**Voltage**	: 277

Shaft Hp	: 1.5	**Method**	: Capacitor Start, Induction Run
Shaft kW	: 1.12		
Efficiency (%)	: 0.64	**LRkVA Factor**	: 9.5
Design	: Capacitor Start, Induction Run	**LRkVA Code**	: L
Load Factor	: 100.0		

split system Three Phase Quantity : 2 In this Step

Category : AC

Running kW	: 1.5	**Starting kW**	: 9.37	**Peak kW**	: None
Running kVA	: 2.03	**Starting kVA**	: 12.83	**Peak kVA**	: None
Running PF	: 0.74	**Starting PF**	: 0.73	**Cyclic**	: No
Running Amps	: 5.64	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 1.5			**Voltage**	: 208

AC Tons	: 1.5	**Method**	: Across the line
		Low Inertia	: No
EER per Ton	: 12.0	**LRkVA Factor**	: 9.5
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: L

freezer Single Phase Quantity : 1 In this Step

Category : AC

Running kW	: 5.0	**Starting kW**	: 34.13	**Peak kW**	: None
Running kVA	: 6.25	**Starting kVA**	: 42.66	**Peak kVA**	: None
Running PF	: 0.8	**Starting PF**	: 0.8	**Cyclic**	: No
Running Amps	: 30.05	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 5.0			**Voltage**	: 208

AC Tons	: 5.0	**Method**	: Capacitor Start, Induction Run
EER per Ton	: 12.0	**LRkVA Factor**	: 9.5
		LRkVA Code	: L

fan Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 0.78	**Starting kW**	: 6.81	**Peak kW**	: None
Running kVA	: 1.15	**Starting kVA**	: 8.85	**Peak kVA**	: None
Running PF	: 0.68	**Starting PF**	: 0.77	**Cyclic**	: No
Running Amps	: 1.38	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 0.78			**Voltage**	: 480

Shaft Hp	: 0.75	**Method**	: Across the line
Shaft kW	: 0.56	**Low Inertia**	: No
Efficiency (%)	: 0.72	**LRkVA Factor**	: 11.8
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: N
Load Factor	: 100.0		

recirc pump Three Phase Quantity : 2 In this Step

Category : Motor

Running kW	: 1.45	**Starting kW**	: 3.42	**Peak kW**	: None
Running kVA	: 1.91	**Starting kVA**	: 4.75	**Peak kVA**	: None
Running PF	: 0.76	**Starting PF**	: 0.72	**Cyclic**	: No
Running Amps	: 2.3	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 1.45			**Voltage**	: 480

Shaft Hp	: 1.5	**Method**	: Wye-Delta
Shaft kW	: 1.12		
Efficiency (%)	: 0.77	**LRkVA Factor**	: 9.5
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: L
Load Factor	: 100.0		

dom water booster pump Three Phase Quantity : 1 In this Step

Category : Motor

Running kW	: 6.58	**Starting kW**	: 28.14	**Peak kW**	: None
Running kVA	: 7.56	**Starting kVA**	: 50.25	**Peak kVA**	: None
Running PF	: 0.87	**Starting PF**	: 0.56	**Cyclic**	: No
Running Amps	: 9.1	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 6.58			**Voltage**	: 480

Shaft Hp	: 7.5	**Method**	: Across the line
Shaft kW	: 5.59	**Low Inertia**	: No
Efficiency (%)	: 0.85	**LRkVA Factor**	: 6.7
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: H
Load Factor	: 100.0		

Steps and Dips Details Report

Project - bayard ms

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 125.0	**Max. Step kW**	: 154.0 In Step 2	**Cumulative Step kW**	: 224.7
Running kVA	: 144.3	**Max. Step kVA**	: 206.3 In Step 2	**Cumulative Step kVA**	: 287.6
Running PF	: 0.87	**Peak kW**	: None	**Cumulative Peak kW**	: None
Running NLL kVA	: 84.8	**Peak kVA**	: None	**Cumulative Peak kVA**	: None
Alternator kW	: 174.33				

Generator Set Configuration

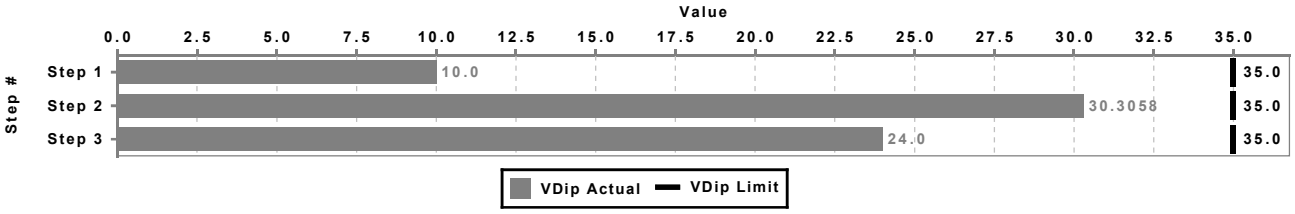
Model	: C150D6D	**Alternator**	: UCD3J
Engine Model	: QSB7-G5 NR3	**Excitation**	: PMG
Fuel	: Diesel		High Ambient

Step Level Dips Summary

Step #	Voltage Dip Limit (%)	Expected Step Voltage Dip (%)	Voltage Recovery Time (s) **	Frequency Dip Limit (%)	Expected Frequency Dip (%)	Frequency recovery Time (s) **
1	35	10	0.7	10	4	1.8
2	35	30	1.6	10	10	2.9
3	35	24	1.3	10	8	1.6

Note: Please refer to the model Spec. sheet for bandwidths used to report recovery times. For products manufactured in the United Kingdom it may be assumed that recovery times are based on ISO8528-5 G2 class bandwidths. Voltage and frequency recovery times are estimates. Typically, allow five to ten seconds between application of load steps when designing your system.

**Please note that in some cases the voltage and frequency recovery time estimates are not shown in list. This is a result of "dummy" data points temporarily being used to fill data gaps in the GenSize database. Please disregard these blank results.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30.0
32.5
35.0
Step #
Step 1
Step 2
Step 3
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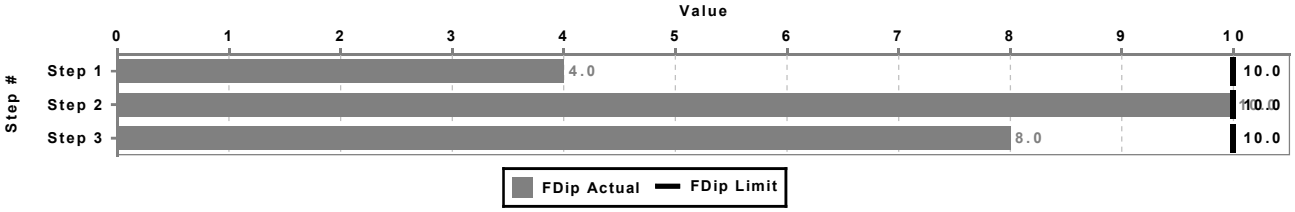
35.0
35.0
35.0
VDip Actual
VDip Limit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5
6
7
8
9
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Step #
Step 1
Step 2
Step 3
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8.0
10.0
10.0
10.0
FDip Actual
FDip Limit

Recommended Generator Report - C175D6D

Project - bayard ms fire pump

Comments - fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 120.0	**Max. Step kW**	: 99.0 In Step 1	**Cumulative Step kW**	: 99.0
Running kVA	: 130.6	**Max. Step kVA**	: 237.1 In Step 1	**Cumulative Step kVA**	: 237.1
Running PF	: 0.92	**Peak kW**	: 61.0	**Cumulative Peak kW**	: 99.0
Running NLL kVA	: 40.5	**Peak kVA**	: 196.7	**Cumulative Peak kVA**	: 237.1
Alternator kW	: 138.44			**Pct Rated Capacity**	: 68.6

Generator Set Configuration

Alternator	: UC3G	**Engine**	: QSB7-G5 NR3
BCode	: B943	**Fuel**	: Diesel
Excitation	: Shunt	**Displacement, cu in. (Litre)**	: 408.0(6.7)
Voltage Range	: 220/440-240/480	**Cylinders**	: 6
Number of Leads	: 6	**Altitude Knee, ft(m)**	: 5945(1812)
Reconnectable	: Yes	**Altitude Slope, % per 1000ft(304.8m)**	: 8
Full Single Phase Output	: No	**Temperature Knee, °F(°C)**	: 122(50)
Increased Motor Starting	: No	**Temperature Slope, % per 18°F(10.0°C)**	: 34
Extended Stack	: No	**Emissions**	: Tier 3
		Cooling Package	: Enhanced High Ambient

Set Performance / Load Requirements

Running At	: 68.6% Rated Capacity		
Max. Step Voltage Dip, %	: 15	**Max. Allowed Step Voltage Dip**	: 15 In Step 1
Max. Step Frequency Dip, %	: 6	**Max. Allowed Step Frequency Dip**	: 10 In Step 1
Peak Voltage Dip, %	: 13	**Peak Voltage Dip Limit %**	: 15.0
Peak Frequency Dip, %	: 4	**Peak Frequency Dip Limit %**	: 10
Site Rated Standby kW/kVA	: 175 / 219	**Running kW**	: 120.0
		Running kVA	: 130.6
Site Rated Max. SkW	: 211	**Effective Surge kW**	: 99.0
Max. SkVA	: 563	**Effective Surge kVA**	: 237.1
Temp Rise at Full Load, °C	: 120	**Percent Non-Linear Load**	: 32.0
Voltage Distortion	: 3.9	**Voltage Distortion Limit**	: 10
Site Rated Max Step kW Limit	:	**Max Step kW**	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.

Loads Summary Report

Project - bayard ms fire pump

Comments - fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Loads Summary List

***Note: Detailed Loads and Step Report available below**

Step No.	Load Name	Quantity	Running		Starting		Peak		Dip Limits, %		VTHD% Limit
			kW	kVA	kW	kVA	kW	kVA	Vdip	Fdip	
Step01	Light Load 1	1	30.0	31.58	30.0	31.58	None	None	35.0	10.0	10.0
Step01	fire alarm	1	8.0	8.89	8.0	8.89	None	None	35.0	10.0	10.0
Step01	Fire Pump Load 1	1	81.98	90.09	60.97	196.67	60.97	196.67	15.0	10.0	0.0
Step Summary			120.0	131.0	99.0	237.0	61.0	196.7	15.0	10.0	10.0

Project Summary	Running		Max Starting		Cumulative Step		Cumulative Peak		Project VTHD% Limit
	kW	kVA	kW	kVA	kW	kVA	kW	kVA	
	120.0	130.6	99.0	237.1	99.0	237.1	99.0	237.1	10.0

***Note: Detailed Loads and Step Report available below**

Loads and Steps Detail Report

Project - bayard ms fire pump

Comments - fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 120.0	**Max. Step kW**	: 99.0 In Step 1	**Cumulative Step kW**	: 99.0
Running kVA	: 130.6	**Max. Step kVA**	: 237.1 In Step 1	**Cumulative Step kVA**	: 237.1
Running PF	: 0.92	**Peak kW**	: 61.0	**Cumulative Peak kW**	: 99.0
Running NLL kVA	: 40.5	**Peak kVA**	: 196.7	**Cumulative Peak kVA**	: 237.1
Alternator kW	: 138.44				

Step1

Calculated Individual Generator Set Step Load Requirements

Running kW	: 120.0	**Starting kW**	: 99.0	**Cumulative Step kW**	: 99.0
Running kVA	: 131.0	**Starting kVA**	: 237.0	**Cumulative Step kVA**	: 237.0
Running Amps	: 157.0	**Starting Non-linear kVA**	: 40.0		
Running Non-linear kVA	: 40.0				
Alternator kW	: 138.44				
Voltage Distortion Limit for step	: 10				

Light Load 1 Three Phase Quantity : 1 In this Step

Category : Light - LED

Running kW	: 30.0	**Starting kW**	: 30.0	**Peak kW**	: None
Running kVA	: 31.58	**Starting kVA**	: 31.58	**Peak kVA**	: None
Running PF	: 0.95	**Starting PF**	: 0.95	**Cyclic**	: No
Running Amps	: 38.03	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Running NLL kVA	: 31.58				
Starting NLL kVA	: 31.58			**Voltage**	: 480
Alternator kW	: 45.26				

fire alarm Three Phase Quantity : 1 In this Step

Category : Battery Charger

Running kW	: 8.0	**Starting kW**	: 8.0	**Peak kW**	: None
Running kVA	: 8.89	**Starting kVA**	: 8.89	**Peak kVA**	: None
Running PF	: 0.9	**Starting PF**	: 0.9	**Cyclic**	: No
Running Amps	: 24.71	**Max. % Voltage Dip**	: 35.0	**Max. % Frequency Dip**	: 10.0
Running NLL kVA	: 8.89				
Starting NLL kVA	: 8.89			**Voltage**	: 208
Alternator kW	: 11.2				

Output kW	: 8.0	**Efficiency (%)**	: 0.9
Rectifier Type	: 6 pulse	**THDI %**	: 26
		THDV %	: 10

Fire Pump Load 1 Three Phase Quantity : 1 In this Step

Category : Fire Pump

Running kW	: 81.98	**Starting kW**	: 60.97	**Peak kW**	: 60.97
Running kVA	: 90.09	**Starting kVA**	: 196.67	**Peak kVA**	: 196.67
Running PF	: 0.91	**Starting PF**	: 0.31	**Cyclic**	: Yes
Running Amps	: 108.49	**Max. % Voltage Dip**	: 15.0	**Max. % Frequency Dip**	: 10.0
Alternator kW	: 81.98			**Voltage**	: 480

Shaft Hp	: 100.0	**Method**	: Wye-Delta
Shaft kW	: 74.6		
Efficiency (%)	: 0.91	**LRkVA Factor**	: 5.9
Design	: Standard NEMA Design B,C or D	**LRkVA Code**	: G
Load Factor	: 100.0		

Steps and Dips Details Report

Project - bayard ms fire pump

Project Requirements

Frequency, Hz	: 60.0	**Generators Running in Parallel**	: 1
Duty	: Standby	**Site Altitude, ft(m)**	: 361(152)
Voltage	: 277/480, Series Wye	**Site Temperature, °C**	: 25
Phase	: 3	**Max. Altr Temp Rise, °C**	: 125
Fuel	: Diesel	**Project Voltage Distortion Limit, %**	: 10
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 120.0	**Max. Step kW**	: 99.0 In Step 1	**Cumulative Step kW**	: 99.0
Running kVA	: 130.6	**Max. Step kVA**	: 237.1 In Step 1	**Cumulative Step kVA**	: 237.1
Running PF	: 0.92	**Peak kW**	: 61.0	**Cumulative Peak kW**	: 99.0
Running NLL kVA	: 40.5	**Peak kVA**	: 196.7	**Cumulative Peak kVA**	: 237.1
Alternator kW	: 138.44				

Generator Set Configuration

Model	: C175D6D	**Alternator**	: UC3G
Engine Model	: QSB7-G5 NR3	**Excitation**	: Shunt
Fuel	: Diesel		Enhanced High Ambient

Step Level Dips Summary

Step #	Voltage Dip Limit (%)	Expected Step Voltage Dip (%)	Voltage Recovery Time (s) **	Frequency Dip Limit (%)	Expected Frequency Dip (%)	Frequency recovery Time (s) **
1	15	15	2.8	10	6	1.3

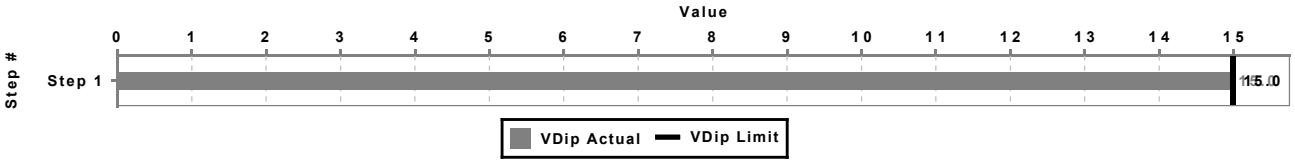
Note: Please refer to the model Spec. sheet for bandwidths used to report recovery times. For products manufactured in the United Kingdom it may be assumed that recovery times are based on ISO8528-5 G2 class bandwidths. Voltage and frequency recovery times are estimates. Typically, allow five to ten seconds between application of load steps when designing your system.

**Please note that in some cases the voltage and frequency recovery time estimates are not shown in list. This is a result of "dummy" data points temporarily being used to fill data gaps in the GenSize database. Please disregard these blank results.

Peak Dips Summary

	Limit, %	Expected, %
Peak Voltage Dip	15	13
Peak Frequency Dip	10	4

Peak Dips consider the voltage and frequency dips for cyclic loads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Step 1
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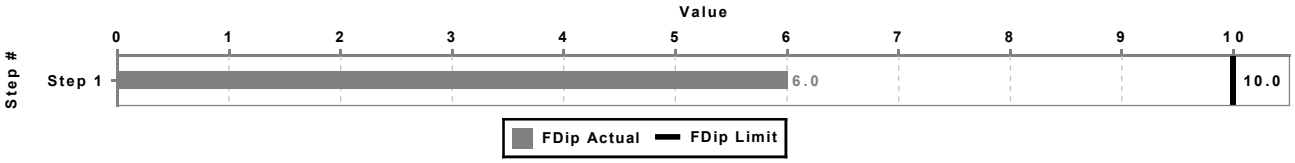
VDip Actual
VDip Limit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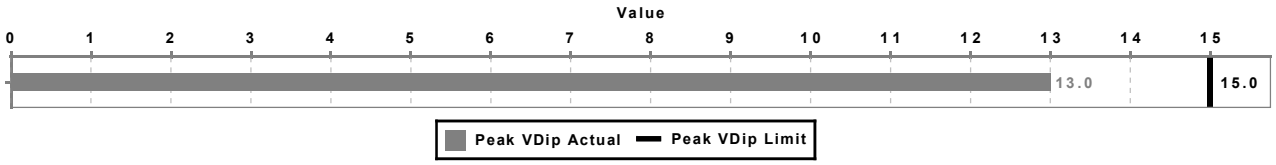
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15.0
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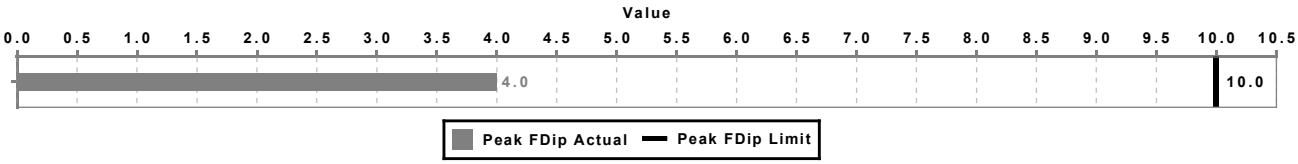
Peak VDip Limit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4.0
10.0
Peak FDip Actual
Peak FDip Limit