



**BID PACKET
FOR**

C4440 Ventilation Fans

Stillwater Electric Utility

**A Division of
Stillwater Utilities Authority**

SUA Bid #16-14/15

February 18, 2015

**Bid Opening Date: March 25, 2015
3:00 P.M. (CST) at City Hall
723 S. Lewis
Stillwater, OK 74074**

STILLWATER UTILITIES AUTHORITY
SUA Bid #16-14/15
C4440 – Ventilation Fans

REFERENCES AND SUPPLEMENTAL INFORMATION

NOTE: Bidder must return this completed form with Bid.

Please respond to the following questions on the space provided or as a clearly identified separate attachment. Failure to respond or responding in an incomplete or evasive manner may be grounds for disqualification as a Bidder.

1. Provide contact information for a least five (5) former clients that have purchased ventilation fans which your company/corporation has manufactured and factory tested at the proposed factory of manufacture, which are currently in service and have been in service in the continental United States for at least the past year.

No.	Name	Company	Address	Telephone	Email
1	Steve Russell	Bridgestone Americas Tire	Aiken, SC	205-328-4000	
2	Kurt Stefanson	Hoaday -Parks	Everett, WA	206-248-9700	
3	Tim Winn	ThermalNetics, Inc	Memphis, TN	248-276-3300	
4	Wes Newman	Colmet	Muncie, IN	888-452-6684	
5	Tom Gelin	Airflow, Inc.	Milwaukee, WI	414-351-7744	



7330 North Teutonia Ave
Milwaukee, Wisconsin 53209
(414) 351-7744 (Tel)
(414) 351-1933 (Fax)
tom@airflowinc.biz
www.airflowinc.biz

Tuesday, March 24, 2015

To: Whom it may concern
Re: Air Flow's relationship with AbsolutAire
From: Tom Gelin

To Whom It May Concern

Air Flow, Inc. has been a customer of AbsolutAire, Inc. since 2003.

Air Flow purchases a variety of AbsolutAire products, including heating, ventilating, cooling and make-up air equipment, many of which are special designs.

Our annual spend with AbsolutAire ranges from \$1.5M to \$3.0M. AbsolutAire generally ships on time, as acknowledged.

Above all, AbsolutAire puts forth an excellent effort to support Air Flow as an organization and the projects we work on. We rarely have disputes, but when we do, they are researched and resolved to satisfy us and our contracting and end user customers.

If you have any questions, please give me a call.

Sincerely,

Thomas E. Gelin

Thomas E. Gelin
President



AIR APPLICATIONS, INC.

March 19th, 2015

To Whom It May Concern

Air Applications, Inc. has been a customer of AbsolutAire, Inc. since 1992.

We purchase a variety of AbsolutAire products, including heating, ventilating, cooling and make-up air equipment, many of which are special designs.

Our annual spend with AbsolutAire ranges from \$1,000,000.00 to over \$ 1,300,000.00. AbsolutAire typically ships on time, as acknowledged.

We rarely have disputes, but if we do, they are resolved promptly.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Andy Schleich

Andy Schleich
President



221 Chesterfield Industrial Blvd
Chesterfield, MO 63005
636-532-1050
www.rji-sales.com

Thursday, March 19, 2015

To Whom It May Concern

RJI, Inc. has been a customer of AbsolutAire, Inc. since 1992.

We purchase a variety of AbsolutAire products, including heating, ventilating, cooling and make-up air equipment, many of which are special designs.

Our annual spend with AbsolutAire ranges from \$350,000 to over \$500,000. AbsolutAire typically ships on time, as acknowledged.

We rarely have disputes, but if we do, they are resolved promptly.

If you have any questions, please give me a call.

Sincerely,

A handwritten signature in black ink, appearing to be 'D Zimmerman'.

David Zimmerman, PE
President
Rollie Johnson, Inc.



March 24, 2015

RE: Absolutaire, Inc.

To Whom It May Concern:

It has been the privilege of Nationwide Mutual Insurance Company to provide surety bonds on behalf of the above contractor for less than one year. In our opinion, Absolutaire, Inc. remains properly financed, well equipped, and capably managed.

At the present time, Nationwide Mutual Insurance Company will provide a surety program to Absolutaire, Inc. As always, Nationwide Mutual Insurance Company reserves the right to perform normal underwriting at the time of any bonds request, including, without limitation, prior review and approval of relevant contract documents, bond forms, and project financing. We assume no liability to Absolutaire, Inc., any obligee/construction manager, any affiliates, or any other parties, if for any reason we do not execute such bonds.

Nationwide Mutual Insurance Company is listed on the U.S. Treasury Department's Listing of Approved Sureties (2013 Department Circular 570), and is rated A+ XV by A.M. Best Company.

Sincerely,

By: _____
Cris Hansen, Contract Bond Underwriter
Nationwide Mutual Insurance Company

Nationwide Mutual Insurance Company
AMCO Insurance Company
Allied Property and Casualty Insurance Company
Farmland Mutual Insurance Company
Nationwide Agribusiness Insurance Company
1100 Locust St., Department 2006
Des Moines, IA 50391-2006

**Summary Bid Form
SUA Bid #16-14/15**

C4440 – Ventilation Fans

February 18, 2015

Stillwater Electric Utility
City of Stillwater
A Division of Stillwater Utilities Authority
P.O. Box 1449
Stillwater, Oklahoma 74076

Note: Please type or use black or blue ink. The City of Stillwater (City) /Stillwater Utilities Authority (SUA) reserves the right to reject any and all Bids when such rejection is in the interest of the City/SUA.

Instructions: Having carefully examined the **BID #16-14/15** and all its attachments we hereby propose to furnish and deliver in compliance with your official notice, *Specifications*, and *Commercial Terms and Conditions*:

No.	Description	Fill in Cost
1.	Ventilation fans in manufactured housings with all controls, wiring, and accessories	\$ 210,341
2.	Transportation (DDP jobsite, Stillwater OK)	\$ 12,354
	Sub-Total	\$ 222,695
3.	Requested Performance and Statutory Bonds	\$ 5,538
	BIDDER'S TOTAL PRICE	\$ 228,233
A1	Option: Recommended Spare Parts for Commissioning	\$ 1,450

Payment Terms:

- 5% upon order entry
- 20% upon release to production
- 50% prior to shipment
- 20% NET 30 days after shipment
- 5% after submittal of close out documents, not to exceed 120days after shipment

Supplier terms to meet Gauranteed Dates:

- Submittals will be available 7 - 10 working days upon acceptance of contract.
- Equipment must be approved and released to production on or before September 21, 2015 for delivery between November 15, 2015 and December 15, 2015.
- "Owner Acceptance Date" is not to exceed more than 6 months after 12/15/2015.

Instruction: In compliance with SUA Bid #16-14/15 *Specifications and Commercial Terms and Conditions* and the Joint Procurement Strategy we hereby propose the following option pricing for Coffeyville:

No.	Description	Fill in Cost
C1.	Ventilation fans in manufactured housings with all controls, wiring, and accessories	\$ 210,341
C2.	Transportation (DDP jobsite, Stillwater OK)	\$ 12,354
	Sub-Total	\$ 222,695
C3.	Requested Performance and Statutory Bonds	\$ 5,538
	BIDDER'S TOTAL PRICE	\$ 228,233
C4.	Option: Recommended Spare Parts for Commissioning	\$ 1,450
C5.	Option: 50% of deduct for duplicate order	\$ (4,495)
	BIDDER'S OPTION TOTAL PRICE FOR COFFEYVILLE	\$ 225,188

Please fill in deductive value (savings), if any, for duplicating the order. If savings are realized by duplicating the order, the savings will be split evenly between Stillwater Utilities Authority and the City of Coffeyville. Please provide 50% of the savings value in A2 below and in line item C5 above. If there are no savings, enter zero in A2 below and C5 above.

No.	Description	Fill in Deduct
A2.	Option: 50% of deduct for Stillwater Utilities Authority Item No. 1	\$ (4,495)

The aforementioned option prices C1 through C5 & A2 are valid for _____ Days after contract award.

Data required with Bid:

No.	Description	Bidder Action
1.	Guaranteed Dates (<i>Commercial Terms and Conditions</i> Exhibit 1)	Review and confirm dates
2.	Milestone Payment & Cancellation Schedule (<i>Commercial Terms and Conditions</i> Exhibit 3)	Provide
3.	Submittals Schedule (Specifications SECTION 013301, Appendix A)	Provide data requested "With Bid"
4.	Technical Data (Specification Section 239433)	Provide Data

Subject to the acceptance of this proposal and approval of the terms and conditions of the Contract documents, the Successful Bidder understands and agrees to start Work within 3 Days after award of Contract with notice to proceed being given by Owner.

State only exceptions below; do not include comments and/or clarifications, which may be shown by attachments to the proposal. If no exceptions, state "NONE"; provide additional pages if needed.

No.	Exceptions
1.	Exception to Liquidated damages. Supplier will provide \$300/day 1 - 7 days and \$600/day 8 days and beyond max 10% of contract Price.
2.	Exception to Commercial Terms and Conditions (paragraph 6 item C) No Retainage please see the payment terms provided on the summary bid form.
3.	Exception to Aux. Side unit dimensions. The proposed equipment exceeds the total height by 10" and the length by 21"
4.	Exception to Aux Side Motor HP. The required total motor horse power for the proposed unit is 15hp not 10hp as specified. Total BHP less drive loss is 10.59.
5.	
6.	
7.	

LIMITED WARRANTY

This Warranty applies to all products manufactured by AbsolutAire, Inc.

*Any parts furnished by AbsolutAire that prove to be defective at the site of the original installation within **24 months from date of start-up, or 27 months from date of shipment**, (whichever comes first), will be replaced or repaired at AbsolutAire's discretion at no charge to the customer. **Wear items, such as V-Belts, filters, etc., are not included as covered parts under this Warranty.** Defective parts must be returned to AbsolutAire at the customer's expense. Warranty replacement parts will be shipped freight prepaid from AbsolutAire via normal ground service.*

The customer must notify AbsolutAire promptly in writing of any claim under this Limited Warranty. AbsolutAire will require information to ensure the equipment has been installed and maintained properly, and operated as intended within the specifications as stated on the AbsolutAire quotation and/or Order Acknowledgment. Components provided by others are not covered under this Warranty. If an AbsolutAire part fails as a result of components furnished by others, the AbsolutAire component may not be covered under this Warranty.

Reimbursement for labor for removing and/or re-installing replacement parts is included in this Warranty for a period of 30 days from field start-up or 90 days from shipment, whichever comes first. AbsolutAire is responsible to determine the amount of labor reimbursement allowed, based upon the circumstances for each installation. Labor cost reimbursement must be approved by AbsolutAire prior to the work being performed.

Disclaimer: The warranties contained in this written Limited Warranty are made in lieu of all other warranties expressed or implied, statutory or otherwise. In particular, AbsolutAire makes no warranty of merchantability for fitness for a particular purpose, unless written and signed by an officer of the Company referencing this specific disclaimer. AbsolutAire shall have no liability to customer/owner for direct, consequential or incidental damages of any kind whatsoever.

AbsolutAire, Inc
5496 North Riverview Drive
Kalamazoo, MI 49004

Phone: 800.804.4000
Fax: 269.382.5291

www.absolutaire.com

STANDARD TERMS AND CONDITIONS

Applicable to all products manufactured and sold by AbsolutAire, Inc.

Purchase Order Acceptance: All AbsolutAire, Inc. (AAI) proposals, customer purchase orders, and other documents relating to any and all sales by AAI are subject to these Standard Terms and Conditions, regardless of what provisions are stated or implied in other verbal agreements or written documents, unless these Standard Terms and Conditions are specifically addressed and any changes are agreed to in writing by an officer of AbsolutAire, Inc.

Warranty: Any Warranties other than the AbsolutAire Limited Warranty (Lim.War.wp) are Invalid and of no effect unless agreed to in writing by an officer of AbsolutAire, Inc.

Terms of Payment: All prices are FOB KALAMAZOO and payment terms are **NET 30 days after invoice date** unless stated otherwise on the AAI Acknowledgment form.

Price Revisions: The Company reserves the right to revise its prices upon thirty days written notice to the Purchaser. The Purchaser reserves the right to cancel any order that may be subject to price increases that had been previously received and accepted by AAI.

Price Quotations: All AAI price quotations are valid for thirty days.

Governmental: Any taxes, local, state or federal; and charges for code compliance, fees, assessments, permits, etc. are the responsibility of the Purchaser.

Order Changes and/or Cancellations: Cancellations or changes received thirty (30) days prior to Acknowledged shipping date may be entered at no charge to the Purchaser. Any other change or cancellation of an order will be subject to charges as determined by AAI at the time of notification.

Engineering Design Changes: AbsolutAire may make engineering design changes without notice as long as these changes do not affect the product performance as ordered by the Purchaser.

Freight Claims, Shortages, Damage, etc.: Each shipment should be examined by the Purchaser before acceptance from the freight carrier. Claims for shortages, damage, etc. should be noted on the carrier's Bill of Lading, a claim should immediately be filed by the Purchaser with the carrier, and AbsolutAire should be notified by the Purchaser so AAI can assist in corrective action.

Acts of God: AbsolutAire cannot be responsible for delays, damage or losses of any kind that are caused by fire, strike, lockout, union disputes, floods, transportation delays, war, embargo or anything else beyond AAI's reasonable control.

**AbsolutAire, Inc.
5496 North Riverview Drive
Kalamazoo, MI 49004**

Phone: 800.804.4000

Fax: 269.382.5291

www.absolutaire.com

04/01 (limwar.doc)



November 4, 2013

AbsolutAire, Inc. • 5496 North Riverview Drive • Kalamazoo, MI 49004

Phone: 800-804-4000

Fax: 269-382-5291

www.absolutaire.com

Shipment Delay Policy

As a rule, we strive to give every customer the best ship date possible, and to meet that ship date. Usually, the order will ship on the ship date, which is the date the job is invoiced. Occasionally, there are exceptions and they need to be addressed.

Invoicing

We pay our vendors for the materials used in our equipment within their standard credit terms of Net 30 days. Our employees that build the equipment are paid weekly. Therefore, we have paid for most or all of the equipment costs prior to the scheduled ship date. We also expect to receive our payment within 30 days from our scheduled ship date. When complete, the equipment is invoiced regardless if it is actually shipped. If the customer asks us to store the equipment until they are ready for it, our credit terms still apply, and are based on the invoice and production completion date.

Storage Fees

It is important to notify us as soon as possible if a customer learns that it is unlikely they will be ready to receive our equipment per our ship date. If the job is delayed before it enters our assembly process, the ship date (completion date) will be reassigned. Once the equipment has been started in our assembly process, it will continue until complete. The equipment will be made ready for shipment, invoiced and stored.

We will store equipment for up to 60 days at no cost. After that period, a storage fee of 1% per month will apply. Storage fees will be invoiced on the actual ship date.

We are pleased to be able to offer this storage service, however our space is limited.

While the equipment is at our facility, it is protected, stored and covered by our insurance.

If you have any questions, please contact sales@absolutaire.com.

s:/sales/Policy - Invoicing & Storage Fees.doc



Submitted By:

Bidder: Chris Russell

Company: AbsolutAire, Inc.

Address: 5496 North Riverview Dr., Kalamazo, MI 49004

E-Mail Address: crussell @ absolutaire.com

Phone: 800-804-4000 **Fax** 269-382-5291

Authorized Signature: 

Date: 03/24/2015

Non-Collusion Affidavit

Stillwater Utilities Authority

STATE OF Michigan)
) ss
COUNTY OF Kalamazoo)

I, Adam Budnick, of lawful age, being first duly sworn, on oath says:

1. (S)He is the duly authorized agent of AbsolutAire, Inc the Supplier under the Contract which is attached to this statement, for the purpose of certifying the facts pertaining to the giving of things of value to government personnel in order to procure said Contract;

2. (S)He is fully aware of the facts and circumstances surrounding the making of the Contract to which this statement is attached and has been personally and directly involved in the proceedings leading to the procurement of said Contract; and

3. Neither the Supplier nor anyone subject to the Supplier's direction or control has paid, given or donated or agreed to pay, give or donate to any officer or employee of the State of Oklahoma or City of Stillwater any money or other thing of value, either directly or indirectly, in procuring the Contract to which this statement is attached.

AbsolutAire, Inc.
(Company Name)

Adam M. Budnick
VICE PRESIDENT

This instrument was subscribed, acknowledged, and sworn to before me this 23rd day of March, 2015, by Adam Budnick, the person signing above, as the above-named Supplier's duly authorized agent.

Deborah J. Crowe
Notary Public

My Commission Expires: 9-29-19
My Commission No.: _____

Business Relationships Affidavit

Stillwater Utilities Authority

STATE OF Michigan)

COUNTY OF Kalamazoo)

Adam Budnick, OF LAWFUL AGE, BEING FIRST DULY SWORN, ON OATH SAYS THAT (S) HE IS THE AGENT AUTHORIZED BY THE BIDDER TO SUBMIT THE ATTACHED BID. Affiant further states that the nature of any partnership, joint venture, or other business relationship presently in effect or which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any officer or director of the Bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationships hereinabove mentioned exist, affiant should so state.)

Adam M. Budnick
Signature of Authorized Agent

Subscribed and sworn to before me the 23rd day of March 2015.

Deborah J. Crowe
Notary Public

My Commission Expires: 9/29/19 Notary Number: _____

SECTION 239433 - DATA TO BE SUBMITTED WITH BID – OUTDOOR-AIR UNITS: continued

i.	Locked Rotor Current, Amperes	_____
j.	Design Efficiency, percent	_____
k.	Power Factor	_____
l.	Number of Poles	_____
B.	Auxiliary-Side Make-Up Air Units:	
1.	Fans:	
a.	Manufacturer	<u>Twin City Blower</u>
b.	Model Number	<u>EPF</u>
c.	Wheel Size	<u>36"</u>
d.	Type	<u>Airfoil</u>
2.	Air Filter:	
a.	Manufacturer	<u>Camfil</u>
b.	Model Number	<u>Aeropleat IV</u>
c.	MERV Rating	<u>8</u>
d.	Clean Pressure Drop, in wg	<u>.18</u>
e.	Recommended Dirty Filter Allowance, in wg	<u>.35</u>
3.	Housing	
a.	Length, in.	<u>177" Including outside air hood</u>
b.	Width, in.	<u>74.5" Including electrical control compartment</u>
c.	Height, in.	<u>130"</u>
4.	Motors	
a.	Manufacturer	<u>Maraton</u>
b.	Model Number	<u>GT1016</u>
c.	Frame Size	<u>213T</u>
d.	Nameplate Rating, bhp	_____
e.	Service Factor	_____
f.	Rated Speed, rpm	_____
g.	Rated Voltage	_____
h.	Full Load Current, Amperes	<u>9.3</u>
i.	Locked Rotor Current, Amperes	_____
j.	Design Efficiency, percent:	_____

1.03 SUPPLEMENTAL INFORMATION:

- A. Submit the following information on separate sheets with Bid:
1. Fan performance curves showing capacity and horsepower.
 2. Dimensioned outline drawings of each item of Equipment proposed.
 3. A functional description or schematic diagram of the control system.
 4. Weights of all pieces of Equipment.
 5. A list of major separate items which will be shipped to power plant Site.
 6. Description of proposed test procedure for each major item of Equipment.
 7. A list of recommended spare parts including a price for each part.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 239433

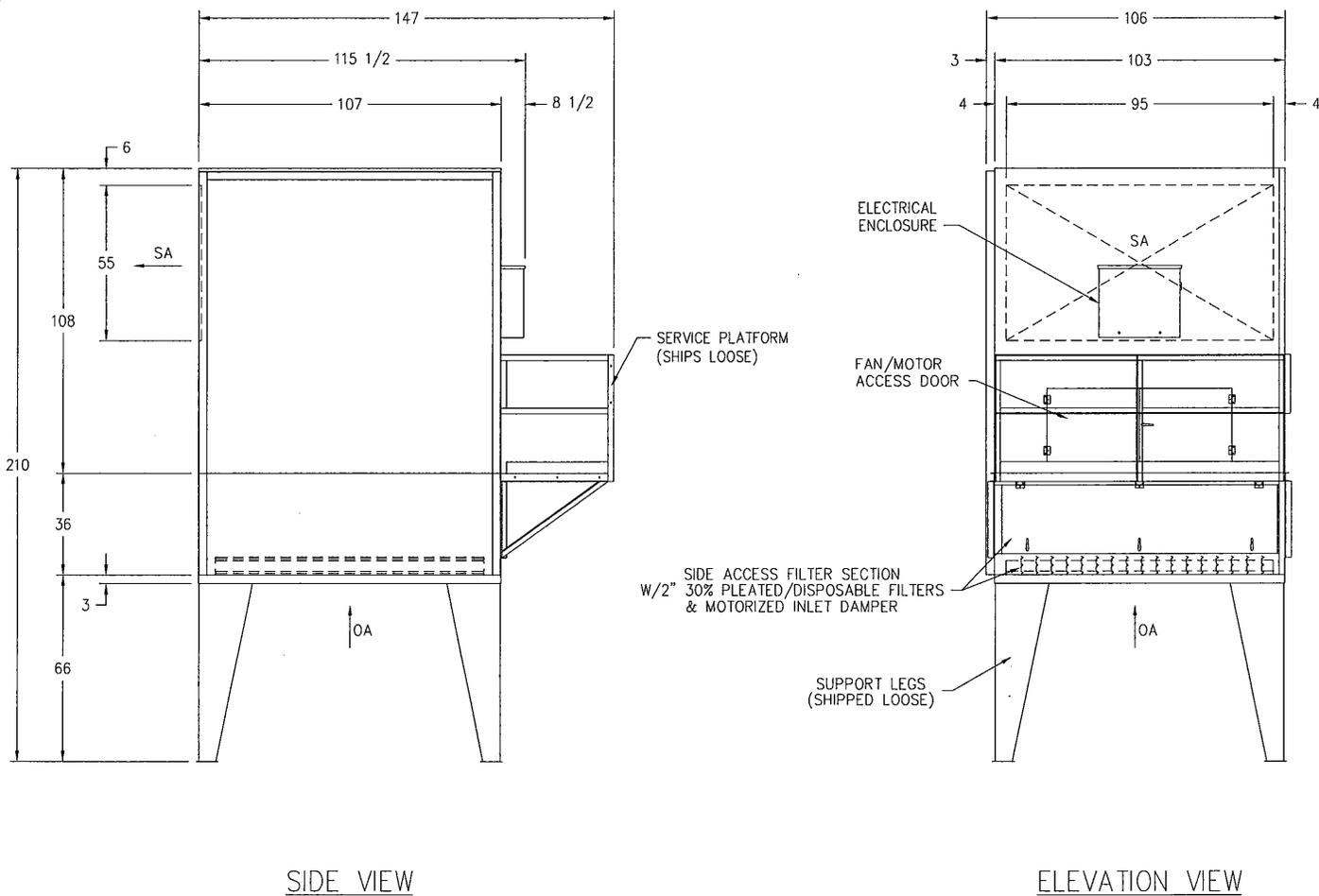
GENERAL NOTES

UNLESS OTHERWISE NOTED, ALL EXTERIOR SURFACES ARE TO BE ALUMINIZED STEEL WITH A PAINTED EXTERIOR. (16 GA. MIN.)

CONTRACTOR TO VERIFY ALL DIMENSIONS BEFORE FABRICATION

APPROXIMATE WEIGHT OF FAN BOX: 4,800 LBS.
 APPROXIMATE WEIGHT OF SIDE ACCESS FILTER SECTION: 1,125 LBS.
 APPROXIMATE WEIGHT OF SERVICE PLATFORM: 600 LBS.
 APPROXIMATE WEIGHT OF SUPPORT LEGS: 325 LBS.

TOTAL APPROXIMATE WEIGHT: 6,850 LBS.



SIDE VIEW

ELEVATION VIEW



5496 N. RIVERVIEW DR.
 KALAMAZOO, MI 49004

PROJECT NAME:		STILLWATER, OK POWER PLANT	
REF. NO./JOB NO.:	74559-1	MODEL:	FB366AF-UO TAG: <i>Generator Side</i>
DRAWN BY:	C. POTTS	DATE:	03-23-15 SCALE: NONE
CERTIFIED BY:		DRAWING NO.:	U:\HTR-SUBM\FB\74000\74559-1



Twin City Fan & Blower

A Twin City Fan Company

5959 Trenton Lane · Minneapolis, MN 55442-3238
Phone (763) 551-7600 · Fax (763) 551-7601 · www.tcf.com



Customer: Stillwater Electric Utility
Job Name:
Job ID: 74559

March 23, 2015
Page 1

Generator Side Units

Fan Description		Fan Performance	
Tag	Generator Side	CFM	70,000
Type	EPF	Operating SP (in.wg)	1.15
Size	660	Standard SP (in.wg)	1.192
Width	SWSI	RPM	474
Class	I	Tip Speed (fpm)	8,190
Wheel diameter (in.)	66	Oper. BHP	23.73
Drive method	60 Hz belt drive	Standard BHP	24.60
Percentage width	100%	Outlet area (sq. ft)	33.8
Percentage diameter	100%	Outlet Velocity (fpm)	2,069
		Temperature (°F)	70
		Altitude (ft)	1,000
		Density (lb/ft ³)	0.072
		Max RPM for Class	637
		Static Efficiency	53.33
		Total Efficiency	65.26

Sound

Sound Power Levels in dB re. 10⁻¹² Watts:

Octave Bands	1	2	3	4	5	6	7	8	LwA
Level at Inlet	97	98	87	82	80	73	66	61	87
Level at Outlet	96	96	91	88	86	79	73	66	91

Estimated sound pressure level in dBA (re: 0.0002 microbar) based on a single* ducted installation:

Distance in ft	1	3	5
dBA at Inlet	87	77	73
dBA at Outlet	91	81	77

*To estimate dBA level for ducted inlet and ducted outlet (into and out of the room) type installation, deduct 20 from the LwA value shown.

Using a directivity factor of 1.

Estimated Sound Pressure based on free field, spherical (Q = 1) radiation at the stated distance.

Definitions:

LwA The overall (single value) fan sound power level, 'A' weighted.

dBA The environment for each fan installation influences its measured sound value, therefore dBA levels cannot be guaranteed. Consult AMCA Publication 303 for further details.
A fan's dBA is influenced by nearby reflective surfaces.



Customer: Stillwater Electric Utility

Job ID: 74559

High Speed

Fan Tag: Generator Side

Model: 660 EPF

CFM: 70,000

SP: 1.15 in.wg

RPM: 474

BHP: 23.73

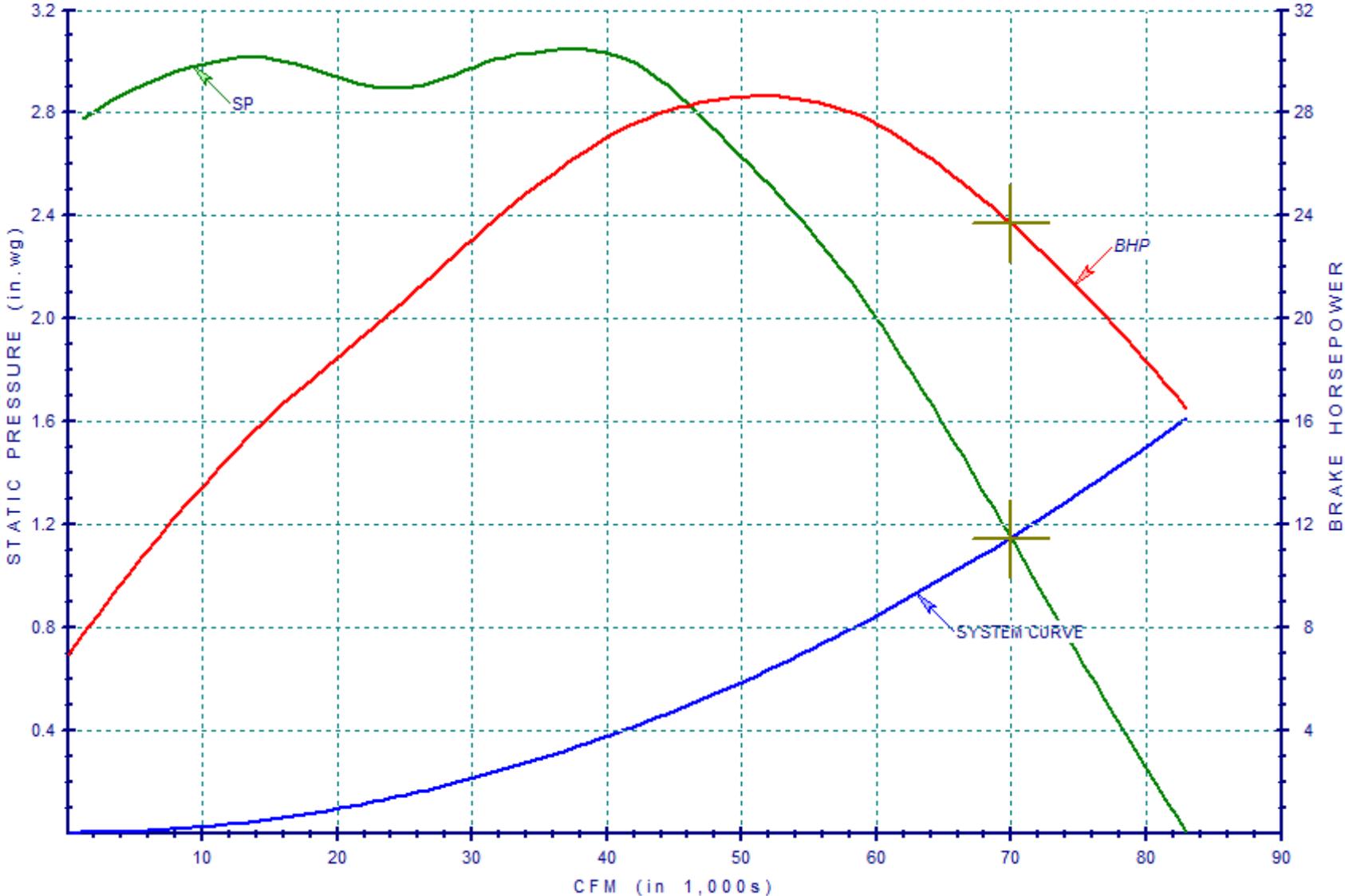
Outlet Velocity: 2,069

Density: 0.072

Corrected for:
Altitude 1,000

87

TWIN CITY FAN AND BLOWER PERFORMANCE CURVE



Sound Power Level		
Octave	In	Out
1	97	96
2	98	96
3	87	91
4	82	88
5	80	86
6	73	79
7	66	73
8	61	66

in db re 10⁻¹² watts

PROPRIETARY

REV. 04-12-13

GENERAL NOTES

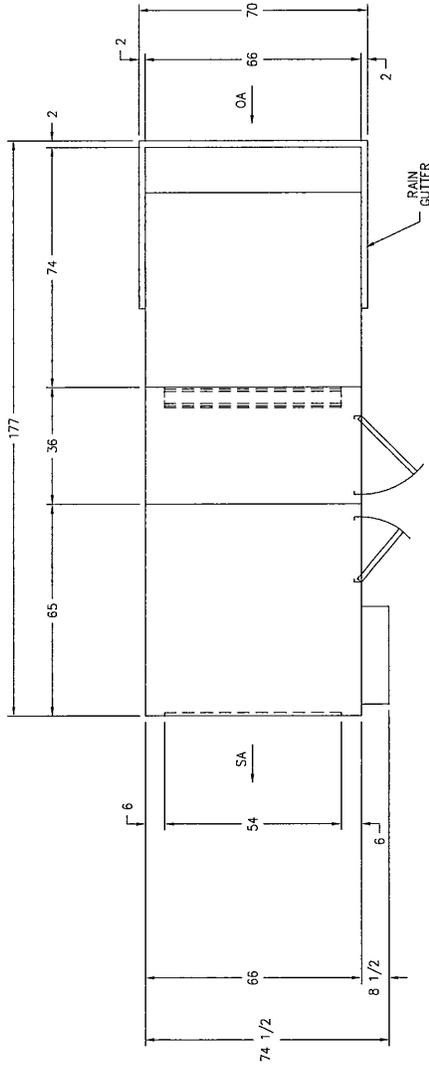
UNLESS OTHERWISE NOTED, ALL EXTERIOR SURFACES ARE TO BE ALUMINIZED STEEL WITH A PAINTED EXTERIOR. (16 GA. MIN.)

CONTRACTOR TO VERIFY ALL DIMENSIONS BEFORE FABRICATION

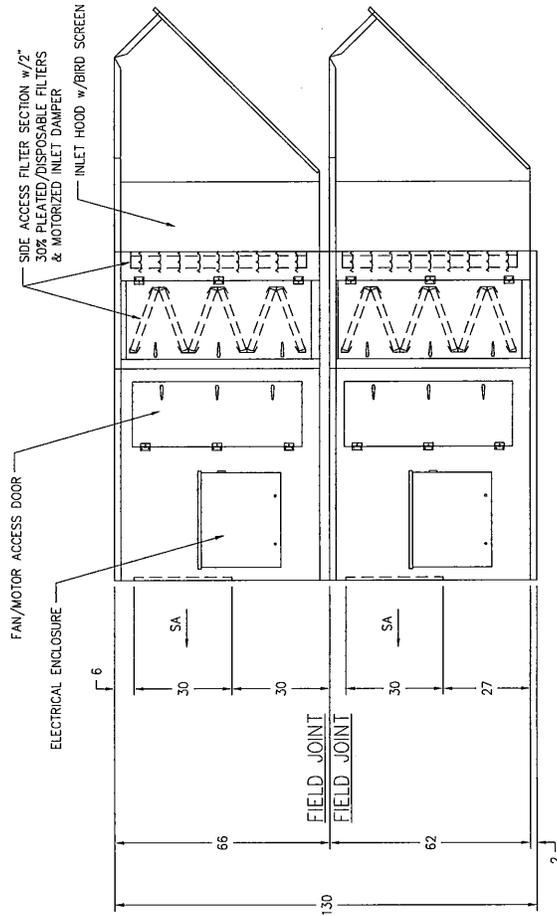
UNIT STRUCTURAL BASE DETAIL

66" W. O.D. X 101" L. O.D.
2" X 2" X 1/4" ANGLE (STRUCTURAL)

** PLEASE NOTE: THIS UNIT SHIPS IN (2) PIECES



PLAN VIEW



CONTROLS SIDE VIEW

APPROXIMATE WEIGHT OF BASE, FB336AF FANBOX: 1,800 LBS.
APPROXIMATE WEIGHT OF OA SIDE ACCESS FILTER SECTION: 325 LBS.
APPROXIMATE WEIGHT OF OA INLET HOOD: 430 LBS.

APPROXIMATE WEIGHT OF BASE, FB336AF FANBOX: 1,800 LBS.
APPROXIMATE WEIGHT OF OA SIDE ACCESS FILTER SECTION: 325 LBS.
APPROXIMATE WEIGHT OF OA INLET HOOD: 430 LBS.

TOTAL APPROXIMATE WEIGHT: 5,550 LBS.

PROJECT NAME: STILLWATER, OK POWER PLANT

REF. NO./JOB NO.: 27888

DRAWN BY: C. POTTS

CERTIFIED BY:

MODEL: FB336AF-HV

DATE: 03-08-13

DRAWING NO.: U:\HTR-SUBM\FANBOX\27888

TAG: MAU-P-1A, 2A, 3A

SCALE: NONE

* 5496 N. RIVERVIEW DR. * KALAMAZOO, MI 49004 *



Twin City Fan & Blower

A Twin City Fan Company

5959 Trenton Lane · Minneapolis, MN 55442-3238
Phone (763) 551-7600 · Fax (763) 551-7601 · www.tcf.com



Customer: Stillwater Electric Utility
Job Name:
Job ID: 74559

March 23, 2015
Page 1

Auxiliary Side Units

Fan Description		Fan Performance	
Tag	Auxillary Side	Total CFM	35,000
# fans per system	2	CFM/fan	17,500
Type	EPF	Operating SP (in.wg)	1.2
Size	365	Standard SP (in.wg)	1.244
Width	SWSI	RPM	751
Class	I	Tip Speed (fpm)	7,176
Wheel diameter (in.)	36.5	Oper. BHP/fan	5.29
Drive method	60 Hz belt drive	Standard BHP/fan	5.49
Percentage width	100%	Tot. Oper. BHP	10.59
Percentage diameter	100%	Tot. Standard BHP	10.98
		Outlet area (sq. ft)	10.35
		Outlet Velocity (fpm)	1,690
		Temperature (°F)	70
		Altitude (ft)	1,000
		Density (lb/ft ³)	0.072
		Max RPM for Class	1151
		Static Efficiency	62.35
		Total Efficiency	71.27

Modifiers

2 fans operating in system

Sound

Individual Sound Power Levels in dB re. 10⁻¹² Watts:

Octave Bands	1	2	3	4	5	6	7	8	LwA
Level at Inlet	87	91	88	75	72	68	60	56	83
Level at Outlet	86	86	85	80	78	74	67	61	83

Total Package Sound Power Levels in dB re. 10⁻¹² Watts:

Octave Bands	1	2	3	4	5	6	7	8	LwA
Level at Inlet	90	94	91	78	75	71	63	59	86
Level at Outlet	89	89	88	83	81	77	70	64	86

Individual fan estimated sound pressure level in dBA (re: 0.0002 microbar) based on a single* ducted installation:

Distance in ft	1	3	5
dBA at Inlet	83	73	69
dBA at Outlet	83	73	69

*To estimate dBA level for ducted inlet and ducted outlet (into and out of the room) type installation, deduct 20 from the LwA value shown.

Using a directivity factor of 1.

Estimated Sound Pressure based on free field, spherical (Q = 1) radiation at the stated distance.



Twin City Fan & Blower

A Twin City Fan Company

5959 Trenton Lane · Minneapolis, MN 55442-3238
Phone (763) 551-7600 · Fax (763) 551-7601 · www.tcf.com



Customer: Stillwater Electric Utility
Job Name:
Job ID: 74559

March 23, 2015
Page 2

Definitions:

- L_{WA} The overall (single value) fan sound power level, 'A' weighted.
- dBA The environment for each fan installation influences its measured sound value, therefore dBA levels cannot be guaranteed. Consult AMCA Publication 303 for further details.
A fan's dBA is influenced by nearby reflective surfaces.



Customer: Stillwater Electric Utility
 Job ID: 74559

Fan Tag: Auxillary Side
 Model: 365 EPF

Total CFM: - 35,000
 SP: _____ 1.2 in.wg
 RPM: _____ 751
 BHP: ____ 5.29 / fan
 Outlet Velocity: .1,690
 Density: ____ 0.072

Corrected for:
 2 fans operating in
 system
 Altitude 1,000

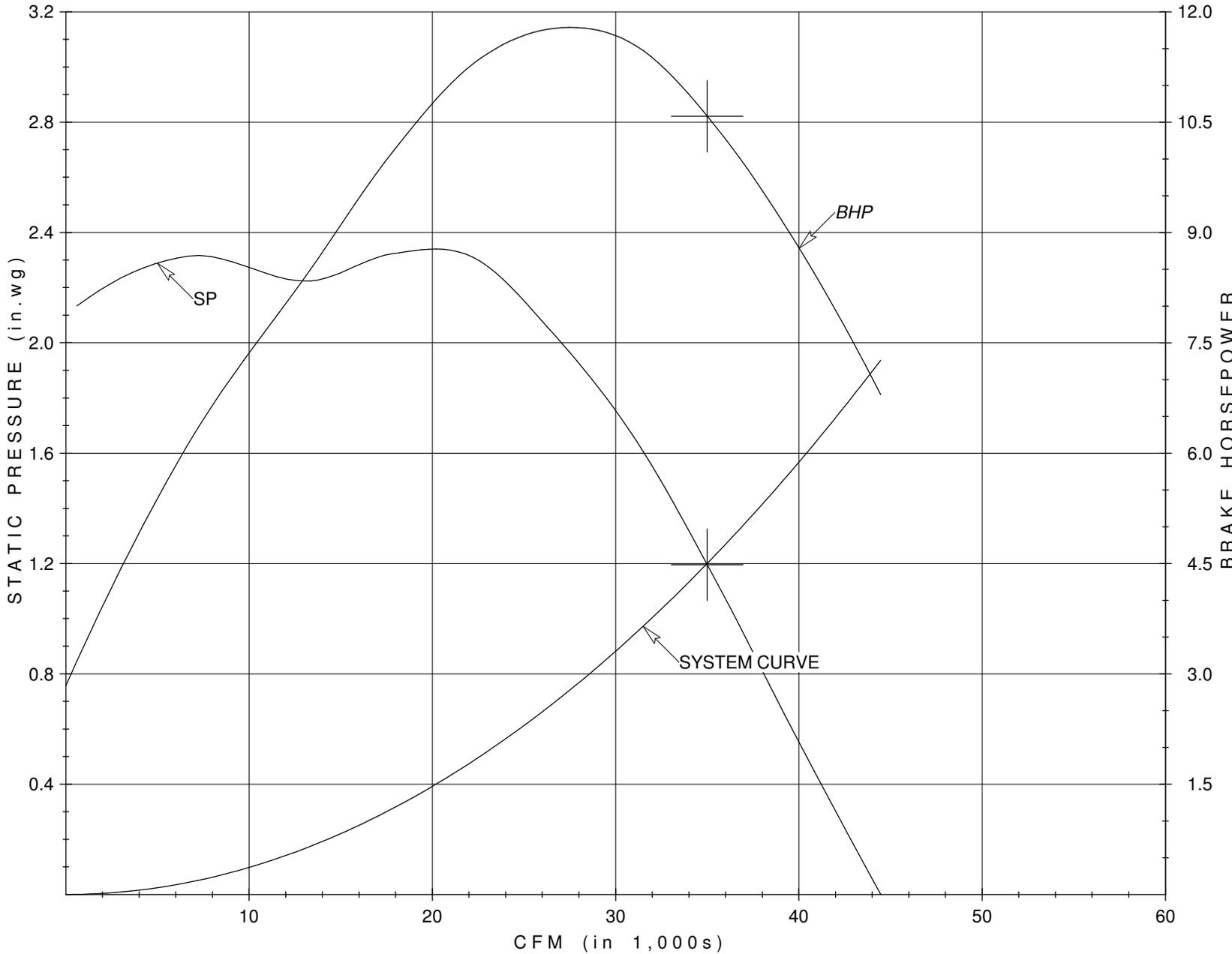
Total Package Sound Power Level		
Octave	In	Out
1	90	89
2	94	89
3	91	88
4	78	83
5	75	81
6	71	77
7	63	70
8	59	64

in db re 10⁻¹² watts

3/23/15
 Page: 1 of 1

86

TWIN CITY FAN AND BLOWER PERFORMANCE CURVE



INVITATION TO BID

The Stillwater Utilities Authority will receive sealed bids for the items below at the Office of the Deputy City Clerk until 3:00 P.M. (CST), Wednesday, March 25, 2015. At that time, bids will be publicly opened and read aloud at the Municipal Building, 723 S. Lewis St., Stillwater, OK 74074 for:

SUA Bid #16-14/15 C4440 – Ventilation Fans

Obtain copy of bid packet from Stillwater Electric Utility Administration Office at 411 E. Third, Stillwater, OK 74074 or call (405) 742-8333 or view at City of Stillwater website, stillwater.org/rfp_bid. All questions should be directed to Mark Sarceda, Mechanical Engineer/Energy Group, Burns & McDonnell Engineering Co., Inc., at (630) 724-3200, office, or (630) 724-3311, direct, or email msarceda@burnsmcd.com.



**BID PACKET
FOR
C4440 Ventilation Fans**

Stillwater Electric Utility

**A Division of
Stillwater Utilities Authority**

SUA Bid #16-14/15

February 18, 2015

**Bid Opening Date: March 25, 2015
3:00 P.M. (CST) at City Hall
723 S. Lewis
Stillwater, OK 74074**

Table of Contents

SUA Bid #16-14/15

C4440 – Ventilation Fans

Notice to Bidders 2

Instructions to Bidders..... 4

REFERENCES AND SUPPLEMENTAL INFORMATION..... 10

Summary Bid Form 11

Non-Collusion Affidavit 16

Bond and Insurance Supplement 17

Certificate of Non-Discrimination..... 20

Non-collusion Affidavit for Payment for Invoice Payment Over \$25,000 21

Contract..... 22

Business Relationships Affidavit..... 24

Performance Bond 25

Statutory Bond 27

Notice of No Bid 29

ATTACHMENT A – Commercial Terms & Conditions

ATTACHMENT B – Drawings & Technical Specifications

Notice to Bidders

SUA Bid #16-14/15

C4440 – Ventilation Fans

Acceptable Bidders: Established companies regularly engaged in the manufacture and sale of this equipment. See also *Evaluation Criteria* in the Instructions to Bidders.

Bid Bond: Not required.

Pre-Bid Conference: Not required.

For questions contact:

Burns & McDonnell Engineering Company, Inc.
Mark Sarceda / Mechanical Engineer / Energy Group
1431 Opus Place, Suite 400
Downers Grove, IL 60515
Direct: 630-724-3311

msarceda@burnsmcd.com

To obtain the BID contact:

Stillwater Electric Utility
411 E. Third
Stillwater, OK 74074
(405) 742-8230

Or

Visit the City of Stillwater website at http://stillwater.org/rfp_bid/

To view BID contact:

Deputy City Clerk
City of Stillwater
723 S. Lewis Street
Stillwater, OK 74074

Or

Visit the City of Stillwater website at http://stillwater.org/rfp_bid/

To submit a Bid: (Bids may NOT be submitted via email prior to bid opening)

Mail **two** paper copies and **one** electronic copy of Bid in a sealed envelope to:

Deputy City Clerk
City of Stillwater
723 S. Lewis Street
Stillwater, OK

Or

Deliver **two** paper copies and **one** electronic copy of Bid in a sealed envelope to:

Deputy City Clerk
City of Stillwater
723 S. Lewis Street
Stillwater, OK

The outside of Bid envelope shall be marked with:

1. Name of the Bidder
2. Bid title and Bid number
3. Date and time of the Bid opening

Successful Bidder must provide:

1. Executed Contract within Thirty (30) days of formal award of Contract by Trustees
2. Executed Performance Bond (on SUA authorized form), Executed Statutory Bond (on SUA authorized form), and Certificate of Public Liability and Worker's Compensation Insurance (certificate must demonstrate coverage in required amounts and endorsement covering the City of Stillwater/SUA per Bid/Contract requirements)

Due Date: Bids must be received at or before **3:00 p.m. (CST) on March 25, 2015**. Any Bid received more than ninety-six (96) hours, excluding Saturdays, Sundays, and holidays, before the time set for the opening of Bids or any Bid so received after the time set for opening of Bids, will not be considered and will be returned unopened to the Bidder.

Public Opening: Bids will be opened at City Hall, 723 S. Lewis Street, Stillwater, Oklahoma and read aloud at **3:00 p.m. (CST) on March 25, 2015**. If attending the Bid opening, please check with front desk for room assignment.

Evaluation/Award: Bids will be referred to Stillwater Electric Utility staff for review and evaluation. The Stillwater Utilities Authority (SUA) may award the Contract to the "lowest responsible Bidder" evaluated in accordance with the *Evaluation Criteria*; however, the SUA reserves the right to reject any or all Bids and to waive any technicalities in the Bidding process. This is an "all or nothing" Bid. The Contract will not be divided among multiple Bidders. No Bid may be altered, withdrawn, or resubmitted within sixty (60) days after the date set for the opening of Bids. Award is anticipated by the end of April, 2015.

Date: February 18, 2015

Elizabeth Chrz
Deputy City Clerk
City of Stillwater, Oklahoma

Instructions to Bidders

SUA Bid #16-14/15 C4440 – Ventilation Fans

1. Receipt and Opening of Bids

The Trustees of the Stillwater Utilities Authority (SUA) (or “Owner”), Stillwater, Oklahoma invites sealed Bids on the referenced Project.

Bids shall be submitted on the forms provided by the Stillwater Utilities Authority in the Bidding document packet. **The Summary Bid Form included in the bid submittal document shall have a tab attached for easy identification.**

Bidding forms shall be filled out accurately and completely (no blank spaces), and shall be submitted typewritten or legibly hand-written in black or blue ink. Prices for work or materials shall be stated both numerically and by writing out the numbers in long-hand (words); whenever a conflict occurs, the words shall govern. A Bid submitted by an individual shall include the name and post office address of the Bidder and shall be signed by the individual Bidder or his/her authorized representative. Firm or partnership Bids shall contain the name and post office mailing address of all firm/partnership members and shall be signed by an authorized representative. Company or corporation Bids shall contain the official company/corporation name, post office address, state of incorporation, and certification of domestication in the State of Oklahoma if chartered out-of-state; the Bid shall be signed by an authorized representative and properly attested. Bids submitted by an agent or other third party shall include a certified copy of the Power of Attorney.

Bidders shall fully complete and sign all affidavits and/or certifications required by federal and state entities and the City of Stillwater on the forms provided with the Bidding documents or as otherwise instructed herein and submit said completed documents with the Bid. Bids containing incomplete and/or unsigned affidavits/certifications will be rejected.

Bids shall be submitted in a sealed envelope. The outside of the envelope shall bear the name of the Bidder, Bid title and Bid number, and the date and time of the Bid opening, all clearly marked in capital letters. Any Bid not submitted in this manner will be rejected and returned to the Bidder. Bids shall be filed with the office of the Deputy City Clerk, City Hall, 723 South Lewis (P. O. Box 1449), Rm. 1113C, Stillwater, Oklahoma 74076, during normal business hours, 8:00 AM CDST to 5:00 PM CDST, Monday through Friday, excluding legal holidays. **Bids will be accepted by the Deputy City Clerk for this project until 3:00 PM, CST, Wednesday, March 25, 2015.** Bids received more than ninety-six (96) hours, excluding Saturdays, Sundays, and holidays, before the time set for opening of Bids, as well as Bids received after the time set for opening of Bids, will not be considered and shall be returned unopened.

A Bidder may modify a Bid by written amendment at any time prior to the scheduled closing time for receipt of Bids, provided such written amendment is received by the Deputy City Clerk prior to the posted Bid closing time. Such modification of the Bid shall be denominated as an add or deduct from the amount stated in the sealed Bid and shall be worded in such a way as not to reveal the amount of the sealed Bid.

A Bid shall be considered irregular for any of the following reasons: omission of material information; alteration of Bidding document form; submission of an addition or condition not requested; an unauthorized alternate Bid; or the Bid is not signed by the Bidder's authorized representative. However, the Stillwater Utilities Authority reserves the right to waive technicalities as to changes, alterations or reservations and make the award in the best interest of the SUA.

The SUA may reject any Bid not prepared and submitted in accordance with the provisions hereof and may reject any and all Bids at its sole discretion. Any Bid may be withdrawn prior to the scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No Bidder may alter or withdraw his Bid after the opening thereof.

All Bids will be referred to Stillwater Electric Utility (SEU) staff for evaluation.

A conditional Bid may not be accepted. A conditional Bid is one containing exceptions to or deviations from the Specifications or other part of this Bid document. If a Bidder cannot meet a specification, such inability shall be addressed as required in the Exceptions section of the *Summary Bid Form*.

Should any ambiguity exist within this Bid document, the Bidder shall request a clarification **before** submitting the Bid, within the time limit specified herein. The SUA will notify all Bidders by email of any ambiguity discovered before the Bid due date.

Bids will be publicly opened and read aloud on the date/time indicated on the Notice to Bidders. All Bids shall be valid for no less than sixty (60) days after the published Bid opening date or any extension thereof.

The SUA reserves the right to reject any or all Bids and to waive any technicalities in the *Specifications* and/or the Bidding process.

2. General Instructions

A pre-Bid conference **will not be held**.

All Bids shall provide for furnishing and delivering all Equipment, Materials and Services in accordance with the *Notice to Bidders* and more completely described in the *Specifications* and the *Commercial Terms and Conditions*.

Additional work, equipment, materials, appurtenances and/or accessories not specifically mentioned but deemed necessary by the Bidder to furnish a complete project, ready for use upon completion, shall be included in the Bid.

The Work shall conform to generally recognized standards of quality of materials and workmanship subject to the Specifications in full, and in compliance with any and all applicable federal and state safety regulations and requirements.

The *Specifications* shall be construed as the minimum standards acceptable. Where brand names are mentioned the term “or approved equal” shall apply. **Substitutions must be approved by SUA.** All “approved equals” must be submitted for consideration at least 10 days prior to the opening of Bids.

THE GUARANTEED DATES SPECIFIED IN THIS BID SOLICITATION ARE BASED ON EXECUTION AND DELIVERY OBLIGATIONS SET FORTH IN OTHER AGREEMENTS RELATED TO THE CONSTRUCTION OF THIS POWER GENERATION FACILITY. ACCORDINGLY, LIQUIDATED DAMAGES SHALL BE ASSESSED AGAINST THE SUPPLIER FOR FAILURE TO MEET THE DEADLINES AND MILESTONES SET FORTH IN THE CONTRACT (SEE ARTICLE 2.5 AND EXHIBIT 1 OF ATTACHMENT A – COMMERCIAL TERMS AND CONDITIONS). ALL BIDDERS SHOULD FACTOR THE ABILITY TO TIMELY MEET THESE DEADLINES AND MILESTONES INTO THEIR DECISION TO RESPOND TO THIS BID SOLICITATION.

Firm Bid prices are required.

The Total Bid Price shall include:

1. Delivery of the Materials and Equipment to the Project Site
2. Field testing on site by the Supplier with SUA approved personnel
3. All other requirements in these Bid documents

The Stillwater Utilities Authority (SUA) is a public trust exempt from taxation under the laws of the State of Oklahoma. Taxes payable for the sale, purchase, or use of materials or equipment should not be included in the Bid price. *However, any tariff, duty, impost, fee, or any similar assessment or tax imposed by a governmental entity that does not recognize SUA’s sovereign tax exempt status, should be included in the Bid as a separate item in the form of a schedule indicating the name and address of the governmental entity and the specific nature and amount of each such tariff, duty, impost, fee, or any similar assessment or tax thereof.*

The following items shall be filed with the Bid:

1. COMPLETED PROPOSAL (BID) FORM(S)
2. NON-COLLUSION AFFIDAVIT

3. BUSINESS RELATIONSHIP AFFIDAVIT

4. STATUTORY AND PERFORMANCE BONDS OR COMMITMENT LETTER(S) AS SET FORTH BELOW

Special Requirements regarding Bonds: Bidders shall be required to **submit with the Bid valid Statutory and Performance Bonds** in a penal sum equal to the dollar value of the Bid. A Bidder may alternatively submit a letter from a Surety stating (1) that the Bidder is qualified to be bonded in the amount of the Bid and (2) that Statutory and Performance Bonds valued at the Bid amount will be issued within Thirty (30) calendar days of the award of the Contract. Bonds must be issued by a Surety authorized to write Bonds in the State of Oklahoma and presently qualified by the United States Treasury ("Treasury List"). **Any Bid received without the required Statutory and Performance Bonds or commitment letter shall be considered incomplete and shall be disqualified. Additionally, if the successful Bidder is unable to produce the required Statutory and Performance Bonds within Thirty (30) calendar days of the award of Contract, said Bidder shall be considered in default and the second best Bidder shall be awarded the Contract.**

3. Qualification of Bidder

The SUA may make such investigation as deemed necessary to determine the ability of the Bidder to complete the Work. Such investigation may involve request(s) from SUA for disclosure(s) from Bidder regarding its business/corporate structure, organization, governance, ownership, financial condition, key project personnel, and current workload. The Bidder shall furnish all such information and data for this purpose as the SUA may request. The SUA reserves the right to reject any Bid if the evidence submitted by, or the investigation of, such a Bidder fails to satisfy the SUA that the Bidder is properly qualified and able to carry out the obligations of the Contract and to complete the Work contemplated therein.

4. Conditions of the Contract

Each Bidder must inform themselves fully of the conditions relating to the completion of the project described in the Specifications. Failure to do so will not relieve the Bidder of the obligation to complete the Work or otherwise carry out the provisions of the Contract.

Insofar as possible, the Successful Bidder, in completing the Work, must employ such methods necessary to prevent any interruption of, or interference with, the Work of any other Supplier or Contractor.

5. Addendum and Interpretation

No exception or deviation to the plans, Specifications or other Contract documents will be made to any Bidder orally. Every request for exceptions or deviations shall be in writing addressed to the person or persons listed in the *Notice to Bidders* as the appropriate official to answer questions. Any such request should be received by said official at least five (5) days prior to the date fixed for the opening of Bids, or it will not be considered.

Any and all exceptions or deviations and any supplemental instructions will be in the form of written addenda to the Specifications, which if issued, will be posted on the City of Stillwater website. All prospective Bidders will be notified of such postings via e-mail not later than three (3) days prior to the date fixed for the opening of Bids. Failure of any such Bidder to observe any such addendum or interpretation shall not relieve such Bidder from any obligation under its Bid as submitted. All addenda so issued shall become a part of the Contract documents.

6. Warranty Requirements

See Article 3 "Warranty" in *Commercial Terms and Conditions*.

7. Law and Regulations

The Bidder's attention is directed to the fact that all applicable state and federal laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over the Work shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

8. Method of Award; Evaluation Criteria

The SUA shall make an award under the competitive sealed Bidding procedures outlined in the *City of Stillwater's Purchasing Manual* on the basis of the lowest responsible Bid. Evaluation of Bidder's proposal will be in accordance with the *Evaluation Criteria* set forth in said manual. Additional factors to be used in determining the lowest responsible Bidder may include but are not limited to the following:

- a. The ability, capacity, and skill of the Bidder to perform the Contract or provide the service or item as per Specifications.
- b. Whether the Bidder can perform the Contract or service or provide the item within the time specified.
- c. Reputation and experience of the Bidder: The proposed type of ventilation fans shall have successfully been installed and operating in other industrial applications within the United States.
- d. Bidder's proposed factory of manufacture shall be ISO 9001:2008 certified.
- e. Quality of performance of previous Contracts or services or items by the Bidder.

- f. Quality, availability, and adaptability of the supplies or Contractual services to the use required.
- g. Ability of the Bidder to provide future maintenance and service from service technicians based in the continental United States for the use of the subject of the Contract.
- h. Number and scope of conditions and exceptions attached to the Bid response.

The SUA reserves the right to reject any and all Bids at its sole discretion.

When a Bid is submitted to the SUA, opened, evaluated and subsequently accepted by the SUA Trustees and a Contract and/or purchase order established, the Bid becomes a binding and legal Contract between the SUA and the Supplier. Additionally, no changes, additions or deletions will be allowed after the Bid is opened. The terms as submitted in the Bid shall be binding.

Payment will be made in accordance with the agreed Milestone Payment Schedule in Exhibit 2 of *Commercial Terms and Conditions* (Bidder to propose).

9. Obligation of the Bidder

Each Bidder shall be presumed to have read and to be thoroughly familiar with the Specifications and Contract documents (including all addenda) at the time of opening Bids. The failure or omission of any Bidder to examine any form, instrument, or document included in this Bid document (as initially released and amended) shall in no way relieve a Bidder from any obligation in respect to its Bid.

10. Other Considerations

The Successful Bidder shall provide within Thirty (30) Days of formal award of Contract by the SUA Trustees the following:

1. A fully executed Contract;
2. An executed Performance Bond (on SUA authorized form);
3. An executed Statutory Bond (on SUA authorized form);
4. Certificate of Public Liability and Worker's Compensation Insurance (certificate must demonstrate coverage in required amounts and endorsements per Bid/Contract requirements); and
5. An executed Non-Collusion Affidavit for Invoices over \$25,000.

Should the Successful Bidder fail to execute the Contract and/or furnish the required bonds, insurance, and affidavit as set forth above within Thirty (30) Days of the award of said Contract, said Bidder shall be considered to have abandoned the Bid and the amount of the certified check or other Surety required as security for such Bid shall be forfeited to the Owner as liquidated damages for failure or refusal to enter into the Contract. The Owner may thereupon award the Contract to any other Bidder.

STILLWATER UTILITIES AUTHORITY
SUA Bid #16-14/15
C4440 – Ventilation Fans

REFERENCES AND SUPPLEMENTAL INFORMATION

NOTE: *Bidder must return this completed form with Bid.*

Please respond to the following questions on the space provided or as a clearly identified separate attachment. Failure to respond or responding in an incomplete or evasive manner may be grounds for disqualification as a Bidder.

1. Provide contact information for a least five (5) former clients that have purchased ventilation fans which your company/corporation has manufactured and factory tested at the proposed factory of manufacture, which are currently in service and have been in service in the continental United States for at least the past year.

No.	Name	Company	Address	Telephone	Email
1					
2					
3					
4					
5					

Summary Bid Form
SUA Bid #16-14/15

C4440 – Ventilation Fans

February 18, 2015

Stillwater Electric Utility
 City of Stillwater
 A Division of Stillwater Utilities Authority
 P.O. Box 1449
 Stillwater, Oklahoma 74076

Note: Please type or use black or blue ink. The City of Stillwater (City) /Stillwater Utilities Authority (SUA) reserves the right to reject any and all Bids when such rejection is in the interest of the City/SUA.

Instructions: Having carefully examined the **BID #16-14/15** and all its attachments we hereby propose to furnish and deliver in compliance with your official notice, *Specifications*, and *Commercial Terms and Conditions*:

No.	Description	Fill in Cost
1.	Ventilation fans in manufactured housings with all controls, wiring, and accessories	\$
2.	Transportation (DDP jobsite, Stillwater OK)	\$
	Sub-Total	\$
3.	Requested Performance and Statutory Bonds	\$
	BIDDER'S TOTAL PRICE	\$
A1	Option: Recommended Spare Parts for Commissioning	\$

Stillwater Utilities Authority & City of Coffeyville

Joint Procurement Strategy

In order to create increased efficiencies and realize cost savings, the Stillwater Utilities Authority and the City of Coffeyville, Kansas are engaged in a joint procurement strategy to develop similar generation facilities. As part of this strategy the City of Coffeyville may execute a separate contract with the Successful Bidder under similar commercial terms and specifications as those stated in SUA Bid#16-14/15. The following variations will apply:

- Buyer: City of Coffeyville
- Project Location: Coffeyville, Kansas

Guaranteed Dates: 90 days after Exhibit 1 - Guaranteed Dates (exact dates to be specified after award)

Instruction: In compliance with SUA Bid #16-14/15 *Specifications and Commercial Terms and Conditions* and the Joint Procurement Strategy we hereby propose the following option pricing for Coffeyville:

No.	Description	Fill in Cost
C1.	Ventilation fans in manufactured housings with all controls, wiring, and accessories	\$
C2.	Transportation (DDP jobsite, Stillwater OK)	\$
	Sub-Total	\$
C3.	Requested Performance and Statutory Bonds	\$
	BIDDER'S TOTAL PRICE	\$
C4.	Option: Recommended Spare Parts for Commissioning	\$
C5.	Option: 50% of deduct for duplicate order	\$
	BIDDER'S OPTION TOTAL PRICE FOR COFFEYVILLE	\$

Please fill in deductive value (savings), if any, for duplicating the order. If savings are realized by duplicating the order, the savings will be split evenly between Stillwater Utilities Authority and the City of Coffeyville. Please provide 50% of the savings value in A2 below and in line item C5 above. If there are no savings, enter zero in A2 below and C5 above.

No.	Description	Fill in Deduct
A2.	Option: 50% of deduct for Stillwater Utilities Authority Item No. 1	\$

The aforementioned option prices C1 through C5 & A2 are valid for _____ Days after contract award.

Data required with Bid:

No.	Description	Bidder Action
1.	Guaranteed Dates (<i>Commercial Terms and Conditions</i> Exhibit 1)	Review and confirm dates
2.	Milestone Payment & Cancellation Schedule (<i>Commercial Terms and Conditions</i> Exhibit 3)	Provide
3.	Submittals Schedule (Specifications SECTION 013301, Appendix A)	Provide data requested "With Bid"
4.	Technical Data (Specification Section 239433)	Provide Data

Subject to the acceptance of this proposal and approval of the terms and conditions of the Contract documents, the Successful Bidder understands and agrees to start Work within _____ Days after award of Contract with notice to proceed being given by Owner.

State only exceptions below; do not include comments and/or clarifications, which may be shown by attachments to the proposal. If no exceptions, state "NONE"; provide additional pages if needed.

No.	Exceptions
1.	
2.	
3.	
4.	
5.	
6.	
7.	

Submitted By:

Bidder: _____

Company: _____

Address: _____

E-Mail Address: _____ @ _____

Phone: _____ Fax _____

Authorized Signature: _____

Date: _____

STILLWATER UTILITIES AUTHORITY
SUA Bid #16-14/15
C4440 – Ventilation Fans

Bond and Insurance Supplement

1. Coincident with the execution of Contract, the Successful Bidder shall furnish good and sufficient Surety company **Performance** and **Statutory Bond**.
 - a. The **Performance Bond** shall guaranty the faithful performance of all the covenants, stipulations and agreements of the Contract, including the guarantying or warranting of all Work and all material included in the Contract against defects in both workmanship and materials; any replacement because of defective materials and workmanship including freight, hauling and installation charges for the Warranty Period to be entirely at Supplier's expense.
 - b. The **Statutory Bond** shall guaranty payment of all bills and obligations arising from the execution of the Contract, which bills and obligations might or will in any manner become a claim against the Owner. All provisions of the bond shall be complete and in full accordance with Statutory requirements.
 - c. All bonds shall be executed with the proper sureties through a company licensed and duly qualified to operate in the State of Oklahoma, and approved by the Owner.
 - d. Bonds shall be signed by an agent resident with the State of Oklahoma who shall furnish evidence of his authority to bind the Surety as valid to the date of the bond. The date of the bond shall be the date of execution of the Contract. If at any time during the continuance of the Contract the Surety on the Company's bond becomes irresponsible, the Owner shall have the right to require additional and sufficient sureties which the Supplier shall furnish to the satisfaction of the Owner within ten (10) Days after notice to do so. In default thereof, the Contract may be suspended and all payments or money due the Supplier withheld.
 - e. All bonds shall be U. S. Treasury listed (Circular #570) as acceptable to the US Government. Acceptable bonds shall only be those supplied by "on shore" corporations.

2. Coincident with the execution of Contract, the Successful Bidder shall purchase and maintain such **Liability Insurance** as will protect it from claims set forth below which may arise out of or result from its operations under the Contract, whether such operations be by itself or by a sub-Contractor, Sub-Supplier or by anyone directly or indirectly employed by them, or by anyone for whose acts any of them may be liable:

- a. Claims under Workers' Compensation, disability, benefits and other similar employee benefits acts: For the duration of this Contract, Supplier shall maintain statutory **Workers' Compensation** and shall maintain **Employer's Liability Insurance** with minimum limits to one million dollars (\$1,000,000). Supplier shall require sub-Contractors to provide Workers' Compensation and Employer's Liability Insurance with the same minimum limits.
- b. Claims for damages because of bodily injury, occupational sickness or disease, or death of his Employees, and his claims insured by usual personal injury liability coverage: For the duration of this Contract, Supplier shall maintain statutory **Workers' Compensation** and shall maintain **Employer's Liability Insurance** with minimum of one million dollars (\$1,000,000). Supplier shall require sub-Contractors to provide Workers' Compensation and Employer's Liability Insurance with the same minimum limits.
- c. Claims for damages because of bodily injury, sickness or diseases or death of any person other than his employees, and claims insured by usual personal injury liability coverage: For the duration of this Contract, Supplier shall maintain occurrence-based **Comprehensive General Liability Insurance** with minimum bodily injury limits of five-hundred thousand dollars (\$500,000.00) for each person and one million dollars (\$1,000,000.00) for each occurrence. Supplier shall maintain property damage insurance with minimum limits of five hundred thousand dollars (\$500,000.00) for each occurrence and one million dollars (\$1,000,000.00) aggregate. The policy shall include Supplier's Protective Liability Insurance with the same minimum limits. Supplier shall require sub-Contractors to provide Comprehensive General Liability Insurance with the same minimum limits.
- d. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from: For the duration of this Contract, Supplier shall maintain **Comprehensive Liability Insurance** with minimum bodily injury limits of five hundred thousand dollars (\$500,000.00) for each person and one million dollars (\$1,000,000.00) for each occurrence. Supplier shall maintain property damage insurance with minimum limits of five hundred thousand dollars (\$500,000.00) for each occurrence and one million dollars (\$1,000,000.00) aggregate. The policy shall include Supplier's Protective Liability Insurance with the same minimum limits. Supplier shall require sub-Contractors to provide Comprehensive Liability Insurance with the same minimum limits.
- e. For the duration of this Contract, Supplier shall maintain **Comprehensive Automobile Liability Insurance** for all owned, non-owned, and hired vehicles with minimum limits for bodily injury of five hundred thousand dollars (\$500,000.00) for each person and one million dollars (\$1,000,000.00) for each occurrence and property damage minimum limits of five hundred thousand dollars (\$500,000.00). Supplier shall require sub-

Contractors to provide Comprehensive Automobile Liability Insurance with the same limits

- f. **Umbrella or Excess Liability:** Contractor shall purchase and maintain occurrence-based **Umbrella or Excess Liability Insurance** written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above in the amount of five million dollars (\$5,000,000). Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

Certificates of Insurance acceptable to the Owner shall be filed by Successful Bidder with the Owner prior to commencement of the Work. These certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least fifteen (15) days prior written notice has been given to the Owner. Copies of certificates of insurance shall be filed with the Owner prior to commencing Work. The required insurance must be written by a company licensed to do business in the state where the Work is located, at the time the policy is issued. In addition, the company must be acceptable to the Owner. The City of Stillwater/Stillwater Utilities Authority, its officers, employees, and agents, shall be named as an additional insured on all liability insurance policies in amounts equal to the liability limits for policies in amounts equal to the liability limits for political subdivisions set forth in Oklahoma Government Tort Claims Act, 51 O.S. § 151, et seq. Engineer Burns and McDonnell Engineering Company, Inc. shall be endorsed as an additional insured on CGL, Automotive and any Umbrella insurance to the policy limits. The insurance shall include a waiver of subrogation in favor of the additional insured.

**Non-collusion Affidavit for Payment
for Invoice Payment Over \$25,000
Stillwater Utilities Authority**

Please note: This form must be completed before payment can be issued for any payment over \$25,000. Bidders are requested to complete this form (with exception of invoice number and date), including notarization, as part of their Bid, as, this will help insure prompt payment should the Bidder be selected as the Successful Bidder.

Bidder Name: _____

Bidder Address: _____
City _____ State _____ Zip _____

DESCRIPTION:

Invoice Number: _____ Invoice Date: _____

Item/s purchased or service/s provided: _____

The undersigned person, of lawful age, being first duly sworn, on oath says that this invoice is true and correct and is authorized to submit the invoice pursuant to a Contract or purchase order. Affiant further states that the work, service/s or material/s as shown by this invoice have been supplied or completed in accordance with the plans, Specifications, orders, requests, or Contract furnished or executed by the affiant. Affiant further states that he/she has made no payment directly or indirectly to any elected official, officer or employee of the Stillwater Utilities Authority or money or any other thing of value to obtain payment of the invoice or procure the Contract or purchase order pursuant to which an invoice is submitted.

Signature of Supplier

Subscribed and sworn to before me this _____ day of _____ 20__ .

Notary Public (or officer having power to administer oaths)
My Commission Expires: _____ Notary Number: _____

Contract
(Example)

THIS CONTRACT AND AGREEMENT, made and entered into this _____ day of _____, 20_____, (the "Effective Date") by and between the Stillwater Utilities Authority, Stillwater, Oklahoma, and _____, hereinafter called the "Supplier",

WITNESSETH:

THAT WHEREAS, the Stillwater Utilities Authority has caused to be prepared in accordance with the law, certain plans, Specifications, and other documents for the Work hereinafter described, and has approved and adopted all of said Contract documents, and has caused solicitation for Bids to be given and advertised as required by law, and has received sealed Bids for the furnishing of all labor and materials for

**C4440 – Ventilation Fans
SUA Bid #16-14/15**

as outlined and set out in the Contract documents and in accordance with the terms and provisions of this Contract; and,

WHEREAS, the Supplier, in response to said solicitation for Bids; has submitted the Stillwater Utilities Authority in the manner and at the time specified, a sealed Bid in accordance with the terms of this Contract; and,

WHEREAS, the Stillwater Utilities Authority, in the manner provided by law, has publicly opened, examined and canvassed the Bids submitted and has determined and declared the above named Supplier to be the lowest and best responsible on the above described Project, and has duly awarded this Contract to said Supplier, for the sum named in the proposal to wit:

(\$ 000,000.00)

NOW THEREFORE, for and in consideration for the mutual agreements and covenants herein contained, the Parties to this Contract have agreed, and hereby agree as follows:

1. The Supplier shall, in a good and workmanlike manner, at his own cost and expense, furnish all labor, materials, tools, and equipment required to complete the Work in strict accordance with the Contract and the following Contract documents: Notice to Bidders, Instructions to Bidders, Bond and Insurance Supplement, References and Supplemental Information, Summary Bid Form, Non-Collusion Affidavit, Bid Bond Requirements, Certificate of Non-Discrimination, Non-Collusion Affidavit for Invoice Payment over \$25,000, Contract, Business Relationship Affidavit, Performance Bond, Statutory Bond, Commercial Terms and Conditions, Specifications, and addenda for SUA Bid #16-14/15 on file in the office of the Deputy City Clerk, City of Stillwater, Municipal Building, Stillwater, Oklahoma, and are made a part of this Contract as fully as if the same were herein set out at length.

2. On completion of agreed Work, but prior to the acceptance thereof by Stillwater Utilities Authority, it shall be the duty of a Stillwater Electric Utility representative to determine, by examination that said agreed Work has been completely and fully performed in accordance with the Contract documents. Upon completion and acceptance of such Work, any remaining amount due for that Work shall be paid to Supplier in accordance with Article 6 Payment of the Commercial Terms and Conditions.
3. Terms used in this Contract have the meaning defined in *Commercial Terms and Conditions* Article 1 Definitions.

IN WITNESS WHEREOF, the Parties hereto have caused this instrument to be executed, in three duplicate originals, the day and year first above written.

Signature Page (to be added upon determination of Parties)

Business Relationships Affidavit

Stillwater Utilities Authority

STATE OF _____)

COUNTY OF _____)

_____, OF LAWFUL AGE, BEING FIRST DULY SWORN, ON OATH SAYS THAT (S) HE IS THE AGENT AUTHORIZED BY THE BIDDER TO SUBMIT THE ATTACHED BID. Affiant further states that the nature of any partnership, joint venture, or other business relationship presently in effect or which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any officer or director of the Bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationships hereinabove mentioned exist, affiant should so state.)

Signature of Authorized Agent

Subscribed and sworn to before me the _____ day of _____ 20_____.

Notary Public

My Commission Expires: _____ Notary Number: _____

Performance Bond

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal,
and _____, as Surety, a
corporation organized and existing under the laws of the State of _____,
and duly authorized to do business in the State of Oklahoma, are held and firmly bound
unto the STILLWATER UTILITIES AUTHORITY, in the penal sum of

_____ Dollars (\$_____) lawful money of the
United States of America, such sum being equal to 100 % of the Contract Price for the
payment of which, well and truly to be made, we, and each of us, bind ourselves, our
successors, and assigns, jointly and severally, firmly by these presents.

Dated this _____ day of _____, 20_____.

The condition of this obligation is such that whereas, the above named Principal did, on
the _____ day of _____, 20_____, enter into a Contract with the
STILLWATER UTILITIES AUTHORITY for the construction/services of _____

All in compliance with the plans and Specifications therefore, made a part of said
Contract, and on file in the Office of the Deputy City Clerk of the City of Stillwater; and
said Contract is hereby made a part and parcel of this bond as if literally written herein.

NOW, THEREFORE, if said Principal shall, fully and faithfully execute the Work and
perform said Contract according to its terms and conditions, and covenants, and in exact
accordance with the Bid of said Principal, and according to certain plans and
Specifications heretofore made, adopted, and placed on file in the Office of the Deputy
City Clerk of the City of Stillwater, as set out in the Specifications herein, and shall
promptly pay, or cause to be paid, all labor, material and/or repairs and all Bids for labor

performed on said Work, whether by Subcontract or otherwise, and shall protect and save harmless the Stillwater Utilities Authority and all interested property owners against all claims, demands, causes of action, losses or damage, and expense to life or property suffered or sustained by any person, firm, or corporation by reason of negligence of the Principal or his or its agents, servants, or employees in the construction/services of said Work, or by or in consequences of any improper execution of the Work or act of omission or use of inferior materials by said Principal, or his or its agents, servants, or employees and shall protect and save the Stillwater Utilities Authority harmless from all suits and claims of infringement or alleged infringement of patent rights or processes, then this obligation shall be void; otherwise this obligation shall remain in full force and effect.

It is further expressly agreed and understood by the Parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, from the obligation of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officer, and the said Surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed by its Attorney-in-Fact, duly authorized so to do, the day and year first above written.

ATTEST:

Secretary

Surety

(Accompany this bond with Attorney-in-Facts Authority from the Surety Company certified to include the date of the bond.)

Statutory Bond

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principals
and _____ as Surety, a
corporation organized and existing under the laws of the State of _____,
And duly authorized to do business in the State of Oklahoma, are held and firmly bound
unto the STILLWATER UTILITIES AUTHORITY, Stillwater, Oklahoma, in the penal sum
of _____ Dollars
(\$ _____), in lawful money of the United States, such sum being equal
to 100 % of the Contract Price for the payment of which sum, well and truly to be made,
we and each of us, bind ourselves, our successors, and assigns, jointly and severally,
firmly by these presents:

Dated this _____ day of _____, 20_____.

THE CONDITION OF THIS OBLIGATION ARE SUCH THAT WHEREAS, the above
named Principal did, on the _____ day of _____, 20_____, enter
into a Contract with the STILLWATER UTILITIES AUTHORITY, Stillwater, Oklahoma, for

All in compliance with the plans and Specifications therefore, made a part of said
Contract and on file in the Office of the Deputy City Clerk of the City of Stillwater.

NOW, THEREFORE, if said Principal shall fail or neglect to pay all indebtedness
incurred by said Principal, Subcontractors, or Sub-Suppliers of said Principal who
perform Work in the performance of said Contract, for labor and materials furnished by
any Supplier and consumed in the performance of said Contract, and such repairs to and
rental of machinery and equipment as may be furnished by a Subcontractor or Sub-
Supplier to the person or persons Contracting with the SUA, within Fifteen (15) Days
after the same becomes due and payable, the person, firm or corporation entitled thereto
may sue and recover on this bond the amount so due and unpaid.

NOW, THEREFORE, it is expressly agreed and understood by the Parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them from the obligations of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed by its Attorney-in-Fact, duly authorized thereunto so to do, the day and year first above written.

ATTEST:

Secretary

Surety

(Accompany this bond with Attorney-in-Fact's Authority from the Surety Company certified to include the date of the bond.)

Notice of No Bid

This sheet is provided for the convenience of vendors submitting a no Bid response to solicitations. Bid number and company name must be indicated by vendor.

REASON FOR NO BID:

- 1. Cannot comply with Specifications
- 2. Cannot meet delivery requirements
- 3. Cannot identify the item(s)
- 4. Do not regularly manufacture or sell the type of item(s) involved
- 5. Other (Specify): _____
- We do We do not desire to be retained on the Bidder list for future procurements of the type of items(s) involved.

Name and address of firm (include zip code)	Signature
	Title

BID NO: SUA #16-14/15 _____

Deputy City Clerk
City of Stillwater
723 S. Lewis
Stillwater OK 74076

Ref. Bid No. SUA #16-14/15 _____

Attachment A

Commercial Terms and Conditions



ATTACHMENT A

COMMERCIAL TERMS & CONDITIONS

Table of Contents

Attachment A..... 1

1. DEFINITIONS..... 3

2. DELIVERY..... 5

3. WARRANTY 5

4. LIQUIDATED DAMAGES 6

5. INSPECTION AND TESTING..... 7

6. PAYMENT 7

7. SECURITY FOR PERFORMANCE..... 8

8. TAXES..... 8

9. SAFETY AND PROTECTION:..... 8

10. TERMINATION..... 9

11. CHANGES..... 10

12. INDEMNIFICATION..... 10

13. PERFORMANCE OBLIGATIONS 11

14. INSURANCE..... 11

15. OTHER REMEDIES 11

16. FORCE MAJEURE 13

17. MISCELLANEOUS 13

EXHIBIT 1 – GUARANTEED DATES..... 15

EXHIBIT 2 – MILESTONE PAYMENT & CANCELLATION SCHEDULE 16

EXHIBIT 3 – PARTIAL WAIVER OF LIEN AND RELEASE OF CLAIMS..... 17

EXHIBIT 4 – FINAL WAIVER OF LIEN AND RELEASE OF CLAIMS 18

1. DEFINITIONS

“Acceptance Date” means the first date by which all of the following have occurred: (a) Supplier has delivered all the Goods and paid all Liquidated Damages due to late delivery; (b) Owner has formally accepted all the Goods have met the Performance Guarantees.

“Alternate” means an amount proposed by Bidder as stated on the *Summary Bid Form* for certain Work activities that may be added to or deducted from the Bid amount if Owner decides to accept a corresponding change in the Work.

“Bid” means the formal offer of the Bidder submitted on the prescribed bid forms together with the required Bid security and all information submitted with the Bid that pertains to performance of the Work.

“Bidder(s)” means any person(s), firm(s), or corporation(s) submitting a Bid for the Work, or their duly authorized representatives.

“Bidder’s Total Price” means the total price in the Bid for the Work without Alternates.

“Change Order(s)” means any change(s) made to the Contract in accordance with Article 11 CHANGES.

“Closeout” means the contractual requirements that apply after Substantial Completion of the Work and before final payment, as described in SECTION 017801.

“Contract” means the contract and agreement made and entered on the Effective Date by and between the Owner and Supplier, including all appendices, attachments, exhibits, Change Orders and all amendments and modifications agreed to and signed by both Owner and Supplier.

“Contract Delivery Date” means the Day when Supplier shall deliver the Equipment as stipulated in the Contract.

“Contract Price” means the total price for the Work agreed between the Parties, as modified by Change Orders.

“Contract Time” means the period of time starting from the Effective Date that is allowed under the Contract for the Supplier to complete the Work.

“Day(s)” means (a) calendar day(s) of 24 hours measured from midnight to the next midnight.

“Deliverables” means the Submittals and other documents delivered to the Owner in performance of Work hereunder including, without limitation, design plans, models, drawings, prints, samples, transparencies, specifications, reports, manuscripts, working notes, documentation, manuals, photographs, negatives, tapes, discs, databases, software, and other information, data, and items embodied in any tangible form.

“Engineer” or “Resident Project Representative” or “CM Agent” means Burns & McDonnell Engineering Company, Inc., a Missouri Corporation, or its duly authorized representatives.

“Effective Date” means the date that the Parties entered into the Contract.

“Equipment” means a Product supplied by Supplier, with operational or nonoperational parts, whether motorized or manually operated, that may require service connections, such as wiring or piping.

“Guaranteed Dates” means the ‘No Later Than’ dates for delivery of the Equipment to the Site and for Substantial Completion as guaranteed by Supplier in Exhibit 1.

“Goods” means Submittals, supplies, Materials, Equipment, consumables, reports, documents, drawings, specifications and all other items that Supplier is required to furnish to complete this Contract.

“Liquidated Damages” means sums due from Supplier in lieu of actual damages in accordance with Article 4 LIQUIDATED DAMAGES.

“Materials” means Products that must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form parts of the Work.

“Owner” means the Stillwater Utilities Authority.

“Party” or “Parties” means the Owner or Supplier, or both together, as the context or the usage of such term(s) may require.

“Product(s)” means item(s) purchased by Supplier for incorporation in the Work, regardless of whether they were specifically purchased for the Project or taken from the previously purchased stock, and includes Material, Equipment, system, and other terms of similar intent.

“Project” means the total construction of which the Work to be provided under this Contract is a part.

“Project Site” or “Site” means the Project location as indicated in Specifications SECTION 011100, 1.02, B.

“Point of Delivery” means the Project Site.

“Repair Work” means the materials, labor, equipment and supervision required to refinish, redesign, repurchase, repair or replace non-conforming Goods or Work including, without limitation, the disassembling, removing, replacing and re-inspecting of any equipment or obstruction preventing such Work and re-performance, repair, replacement or testing such other part of the Work, the Site or work performed by others as shall be necessary to cause the applicable portion of the Work to conform to the Contract.

“Specifications” means those portions of the contract documents in Attachment B, consisting of written technical descriptions of the Work, and covering the Goods, workmanship, and certain administrative details applicable thereto.

“Submittals” means all shop drawings, product data, and samples which are prepared by Supplier, a Sub-Supplier, or manufacturer, and submitted by Supplier to Owner as a basis for approval of the use of Equipment and materials proposed for incorporation in the Work or needed to describe proper installation, operation and maintenance, or technical properties.

“Submittal Schedule” means the table in the Specifications SECTION 013301 Appendix A.

“Substantial Completion” means the event when (i) All Goods have been delivered to the Project Site and the Owner Acceptance Date has been established, (ii) the Equipment and Materials are operating safely and all commissioning and startup field services required by Supplier per contract have completed, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the performance guarantees have been met and Warranty Period has started, and (v) Supplier has delivered to Owner all operating instructions, maintenance manuals, and warranties.

“Sub-Supplier” means an individual, firm, or corporation having a direct contract with Supplier or with any other Sub-Supplier for the performance of a part of the Work, on or off the Site.

“Successful Bidder” means the Bidder selected by the Owner for award of the Contract.

“Supplier” means the Successful Bidder that has entered into the Contract with Owner.

“Warranty Period” means the period of time specified in Article 3 WARRANTY.

“Week” means a period of seven consecutive Days.

“Work” means any and all labor, supervision, services, Goods, consumables, valuations, inspections, engineering, delivery, testing, and all other activities performed by Supplier (or the subcontractors of Supplier at any tier) in connection with the execution and timely completion of Supplier’s obligations under this Contract, including incidental Work such as start-up, inspections, programming, installation, erection or assembly of the Goods.

2. DELIVERY

- a. Goods shall be delivered by Supplier DDP Incoterms[®] 2010 to the Project Site.
- b. Price shall include cost to deliver to the Project Site, including packing per good practice and transport insurance.
- c. Risk of loss shall pass to the Owner upon delivery of the Goods to the Project Site.
- d. Title to the Goods shall pass to the Owner upon the Owner’s acceptance of the Goods.
- e. Goods shall not be manufactured or delivered without prior approval of the required Submittals.

3. WARRANTY

- a. The Supplier warrants that the Goods shall be new, fit for the intended purpose and free of defects in design, workmanship and materials. Supplier also warrants to the Owner that for

elements of any Work for which this Contract does not establish express standards of quality and fitness, such Work shall be in accordance with good industry practices and standards for the specific application.

- b. Warranty Period shall be for a eighteen (18) month period starting on the Acceptance Date by the owner.
- c. If any Work fails to comply in any respect to the warranties set forth herein and Supplier has been given written notice of such noncompliance within the Warranty Period, Supplier shall, at its sole expense, promptly perform all Repair Work.
- d. Supplier shall be responsible for all costs to perform Repair Work including, without limitation, all freight and insurance charges. If Supplier does not commence correction of the Repair Work within two (2) Days following receipt of written notice from the Owner or if Supplier does not proceed diligently to complete the Repair Work, the Owner shall, at its sole discretion, have the right to perform some or all of the necessary Repair Work to remedy the defect, or have third parties perform the necessary Repair Work. In the event the Owner rejects the Goods and chooses to obtain replacement or substitute Goods or Work from someone other than Supplier, Supplier shall also be responsible to pay the Owner the increased costs, if any, between the Contract price for such Goods or Work and the cost to the Owner of obtaining the replacement or substitute Goods including, without limitation, costs incurred by the Owner to manufacture, produce or provide such Goods or Work; or engage other persons to manufacture, produce or provide such Goods or Work. The Owner shall be entitled to set off all costs incurred by the Owner related to such Repair Work from amounts owed to Supplier or to back charge and invoice Supplier for such cost.
- e. Supplier shall bear the risk of loss or damage for Work requiring Repair Work during the period of such Repair Work. If any Work must be removed from the Site, transportation charges associated with any Repair Work shall be borne by Supplier. Supplier shall revise any and all drawings and other documents, as appropriate; to reflect any changes or modifications made during Repair Work. Work required to be corrected, repaired or replaced shall be subject to the warranties of this Contract in the same manner and to the same extent as Work originally delivered under this Contract.
- f. The foregoing warranties shall survive the Owner's inspection, acceptance, use and subsequent dispossession or sale of the Work.

4. LIQUIDATED DAMAGES

- a. **TIME IS OF THE ESSENCE.** Supplier acknowledges that the time for performance of the Work is of the essence of this Agreement, and Supplier agrees to see to the performance of the Work, including the Work performed by Supplier's Sub-Suppliers so that the entire Project may be completed in accordance with the Contract Documents and Exhibit 1 Guaranteed Dates
- b. If Supplier fails to deliver the Submittals noted as "subject to LDs" in the Submittal Schedule within the time therein specified, or fails to meet the Guaranteed Dates, the parties agree that the Owner would be damaged. As it would be almost impossible to ascertain the actual damages precisely, Supplier agrees to pay Liquidated Damages in the amounts listed herein. Any sums payable under this Article are in the nature of Liquidated Damages and not a penalty. The payment of Liquidated Damages shall be the sole and exclusive remedy for the Owner for the specific performance failure to which the Liquidated Damages applies, except that the Owner shall have the right to terminate the Contract for cause if Supplier reaches the aggregate Liquidated Damages cap defined in 4.d. below.

Requirement	Liquidated Damages
Late Delivery – Submittals	\$250/Day per Submittal
Late Delivery - Equipment	\$1,000/Day

- c. Liquidated damages for Late Delivery – Submittals shall be limited to a maximum of 7.5% of the Contract Price.
- d. Aggregate total for all Liquidated Damages shall be limited to a maximum of 10% of the Contract Price.

5. INSPECTION AND TESTING

- a. The Owner reserves the right to review Supplier’s quality assurance and quality control procedures and to inspect and witness all Supplier’s operations and tests.
- b. Supplier shall notify the Owner at least thirty (30) Days in advance when portions of the Work are ready for inspection or testing in accordance with the Supplier’s inspection and test plan as approved by the Owner.
- c. Failure to inspect and accept or reject the Work shall not relieve the Supplier from responsibility for compliance with the Contract requirements nor impose liability on the Owner. The Owner reserves the right to reject Work that is unsatisfactory, faulty, or defective or does not conform to the requirements of the Contract.
- d. Supplier shall carry out factory tests of the Equipment in accordance with Supplier’s procedures for such tests and in accordance with the Specifications. Owner and its representatives including the Engineer shall have the right to witness such factory tests. Date and time of such tests shall be communicated to Owner no later than thirty (30) Days in advance. Supplier shall bear the cost of such tests, but Owner shall bear the cost for its representative to attend them.

6. PAYMENT

- a. Payments shall be made in accordance with the agreed Milestone Payment Schedule in Exhibit 2.
- b. The Owner may require as a condition of payment that the Supplier submit evidence satisfactory to the Owner that any and all claims of subcontractors, suppliers or other third parties that have performed services or provided supplies in connection with the Work included in any invoice have been paid or satisfactorily secured prior to making any partial payment, including but not limited to a Partial Waiver of Lien and Release of Claims as set forth in Exhibit 3 from Supplier and all Sub-Suppliers for whose work payment is sought waiving any lien rights for the amount requested in the invoice
- c. Ten percent retention shall be withheld from all invoice payments and shall be released upon Supplier’s completion of all Closeout requirements contained within the Contract documents, receipt by the Owner of a Final Waiver of Lien and Release of Claims as set forth in Exhibit 4.
- d. Payment shall be made within thirty (30) Days following receipt of a properly documented invoice; however, in no case shall payment be due prior to the date indicated in the milestone payment schedule, and in particular, final payment shall be no sooner than the Acceptance Date.
- e. All currency and payments shall be in U.S. dollars.

7. SECURITY FOR PERFORMANCE

Supplier shall furnish security in accordance with the Article 1 of the *Bond and Insurance Supplement*.

8. TAXES

The Stillwater Utilities Authority (SUA) is a public trust exempt from taxation under the laws of the State of Oklahoma. Taxes payable for the sale, purchase, or use of materials or equipment should not be included in the Bid price. However, any tariff, duty, impost, fee, or any similar assessment or tax imposed by a governmental entity that does not recognize SUA's sovereign tax exempt status, should be included in the Bid as a separate item in the form of a schedule indicating the name and address of the governmental entity and the specific nature and amount of each such tariff, duty, impost, fee, or any similar assessment or tax thereof.

9. SAFETY AND PROTECTION:

- a. Supplier shall take necessary safety precautions with respect to performance of the Work, shall comply with safety measures initiated by Owner and with applicable laws, ordinances, rules, regulations, and orders of public authorities for the safety of persons or property and with the requirements of the Owner's operations and safety procedures, and shall submit information to Owner which fulfills the requirements as indicated in the Stillwater Energy Center Site Specific Safety and Health Plan. Failure to comply with safety provisions outlined in the Stillwater Energy Center Site Specific Safety and Health Plan may result in back charges to Supplier or withholding of payment until safety violations or inadequacies are abated or corrected.
- b. Verbal notification shall immediately be corresponded to Owner of any workplace near miss, incident, accident, injury, illness, death, or related hospitalization of Supplier's employees or agents at the Site of the Project, and a written report shall be made to Owner within twenty-four (24) hours of the occurrence using the Incident/Accident Investigation Form contained in the Stillwater Energy Center Site Specific Safety and Health Plan.
- c. All Supplier employees shall attend Owner's Project orientation training and any site-specific training required by Owner, prior to the employees being allowed to work on the site. If Owner does not provide Project orientation training, Supplier shall provide such training that meets or exceeds the requirements outlined in the Project Orientation Training Report found in the Stillwater Energy Center Site Specific Safety and Health Plan, and the report shall be submitted to Owner. Supplier shall document the subject, date, time, and attendance for these safety meetings, with copies sent to Owner.
- d. Supplier shall be held responsible for its sub-Sub-Suppliers' compliance with the Stillwater Energy Center Site Specific Safety and Health Plan and all applicable rules, laws, regulations and policies, and this Agreement.
- e. The personal protective equipment (PPE) provisions outlined in the Stillwater Energy Center Site Specific Safety and Health Plan shall be enforced by Supplier. The following are minimum requirements for all personnel on the Project Site:
 - A. Safety Glasses ANSI Z-87.1
 - B. Safety Toe work boots with leather upper (no tennis shoe styles)
 - C. Hard Hat
 - D. Shirt with 4 inch minimum sleeves
 - E. Long Pants (no shorts)

- f. Supplier shall provide, or cause to be provided, to each worker on the Project Site, the proper safety equipment for the duties being performed by that worker and shall not permit any worker on the Project Site who fails or refuses to use the same. Owner shall have the right, but not the obligation, to order Supplier to remove the worker from the Project Site for failure to comply with safe job procedures/requirements.
- g. Supplier shall defend, indemnify, and hold harmless Owner and CM Agent from, and be responsible for all claims, damages, and the payment of all fines levied to Supplier or Owner or CM Agent related in any way to safety, health, fire, or environmental violations or deficiencies in the planning or execution of the work, caused in whole or in part by the conduct or failure to act by Supplier, Supplier's employees, or anyone for whom Supplier is responsible or may be liable.
- h. Owner may request and Supplier agrees to the removal from the Project of any Supplier's or its sub-Sub-Supplier's personnel, management, supervision, equipment, tools, or craft for noncompliance with the Stillwater Energy Center Site Specific Safety and Health Plan or non-correction of hazards. Owner's request for removal may also apply to any individual who consistently, in the opinion of Owner, exhibits an unsafe behavior attitude. Owner or CM Agent shall not be liable for any damages experienced by Supplier due to removal of Supplier's or its sub-Sub-Supplier's personnel, management, supervision, equipment, tools, or craft from the Site.
- i. Owner has the authority and may stop Work in progress when necessary to enforce safety requirements. Owner or CM Agent shall not be liable for any damages experienced by Supplier due to stoppage. No part of the time lost due to any such stop work order shall be made the subject of a claim for extension of time or increased costs by Supplier.
- j. In the event the Project Site, or any portion of the work at the Project Site, is stopped or shut down by Owner or any outside agency, caused in whole or in part due to any act, error, or omission of Supplier or its sub-Sub-Suppliers, including, but not limited to, those activities related to safety or health; Supplier shall be responsible for all impact costs and damages suffered by Owner due to such delay or disruption, in addition to the pass through of liquidated damages (if any) suffered by Owner as may be proportionately assessed to Supplier by Owner.
- k. Supplier shall institute and maintain a substance and alcohol abuse prevention program which meets or exceeds the requirements outlined in the Stillwater Energy Center Site Specific Safety and Health Plan.
- l. Supplier, its agents, employees, sub-Sub-Suppliers, and suppliers shall not take cell phones onto the Site without the express written permission of Owner's authorized representative.

10. TERMINATION

- a. Termination for Cause:
 - i. The Owner may terminate this Contract for cause, in whole or in part, by written notice to Supplier if Supplier: fails to deliver the Goods or to perform the Work within the time specified in this Contract; fails to tender conforming Goods; fails to obtain proper licenses, permits and registrations; fails to obtain and maintain required insurance coverage; fails to make progress so as to endanger timely performance of this Contract; fails to comply with the site safety requirements; violates any applicable laws; or fails to provide adequate assurances of performance.

- ii. If, after termination, it is determined that Supplier was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the Contract had been terminated for the convenience of the Owner.
 - iii. Upon issuance of a written notice of termination for cause, Supplier shall proceed as required by this paragraph and the Owner shall be entitled to the rights set forth herein. Supplier shall stop all Work hereunder unless otherwise specified in the notice of termination. The Owner shall not be obligated to make any further payments for the Work. If the Owner has revoked acceptance, then such Work shall be treated as having not been accepted. The Owner shall not be required to accept the tender of any Work that Owner has elected to terminate or cancel. The Owner may take possession of any specialty equipment or specialty tools necessary for completion of the Work. The Owner may complete the performance of this Contract by such means as the Owner selects or may engage any others to complete the performance of this Contract and Supplier shall be responsible for any costs in excess of the Contract value incurred by the Owner in so doing. Any amounts due Supplier for Work completed by Supplier prior to such cancellation shall be subject to offset against such additional costs incurred by the Owner in completing the Work and any other damages incurred by the Owner as a result of Supplier's default.
- b. Termination for Convenience.
- i. Upon at least three (3) Days written notice to Supplier specifying the extent to which the Contract is terminated, the Owner shall have the right to terminate this Contract or any portion thereof with respect to Goods not yet shipped or Work not yet performed, without liability and in addition to its other rights and remedies, at any time and for any reason.

11. CHANGES

- a. The Owner shall have the right, at any time, to make changes in the Contract that the Owner may deem desirable.
- b. Despite any pending dispute with respect to the Contract, Supplier shall proceed, upon written notice from the Owner with the performance of all Work or changes as directed by the Owner.
- c. If the Owner issues a directive that causes a material increase in Supplier's cost or time for performance, Supplier shall notify the Owner in writing within three (3) Days from the date of Supplier's receipt of the Owner's directive, and subject to such proper notice, an equitable adjustment in the price or time of performance shall be mutually agreed upon between the Owner and Supplier. Agreement to such adjustment shall constitute a waiver of all claims by Supplier arising out of or related to the change.

12. INDEMNIFICATION

- a. Bodily Injury/Property: Supplier agrees to defend, indemnify and hold the Owner and Burns & McDonnell and their respective officers, directors and employees harmless from and against all claims, demands, liabilities, losses, damages, suits, judgments, costs, expenses and reasonable attorney's fees (collectively, "Claims") including those arising, in any manner, out of or resulting from bodily injury, sickness, disease or death of any person or persons, or damage to or destruction of property, including any resulting loss of use arising from breach of Contract or any non-conforming Work, including but not limited to, latent defects or environmental liability, except to the extent that any such Claims are the result of the negligence of the Owner or any of its agents or employees.

- b. Intellectual Property: Supplier agrees to defend, indemnify and hold the Owner and Burns & McDonnell and their respective officers, directors and employees harmless from and against all Claims that the Work, in any manner, gives rise to the infringement of any United States patent, trademark, trade dress, copyright or other intellectual property right.
- c. Worker's Compensation: Supplier, for itself, its successors, assigns, hereby expressly agrees to waive any provision of any workers' compensation act or other similar law whereby Supplier could otherwise preclude its joinder by the Owner or Burns & McDonnell as an additional defendant, or avoid liability for damages, contribution, or indemnity in any action at law, or otherwise where Supplier's or its subcontractor's employee or employees, heirs, assigns, or anyone otherwise entitled to receive damages by reason of injury or death brings an action at law against the Owner or Burns & McDonnell.

13. PERFORMANCE OBLIGATIONS

- a. When performing Work at the Site, Supplier shall comply with safety measures and procedures required by the Owner and shall comply with all applicable laws, ordinances, rules, regulations and orders of public authorities for the safety of persons or property.
- b. Supplier acknowledges that the technical documents and information provided in the Contract including, without limitation, all drawings and specifications are sufficient for their intended purpose.
- c. No substitution or modification of any Goods or related component parts, materials, or manufacturing locations may be made without prior written consent of the Owner.
- d. Review and approval of shop drawings, samples, design and fabrication drawings, catalog data or other submittals from Supplier is for the purpose of determining general compliance with the Contract only and the Owner is not reviewing such documents to evaluate the means or methods of design or fabrication. Such review shall not transfer any liability to the Owner or others for the proper design, fabrication and installation of the Work and shall not release Supplier of its sole liability for the Work.
- e. All design drawings custom prepared specifically for this Project shall be sealed/stamped by a licensed professional engineer in accordance with the laws of the state where the Project is located. Said sealing/stamping is the responsibility of the Supplier. Drawings of products, materials, and equipment that are of standard structural designs by the manufacturer, fabricator, supplier, or Supplier need not contain the seal/stamp of a licensed professional engineer.

14. INSURANCE

Supplier shall furnish security in accordance with the Article 2 of the *Bond and Insurance Supplement*.

15. OTHER REMEDIES

- a. Setoff/Recoup: The Owner may set off or recoup any amount owed to Owner by Supplier against any amount owed to Supplier by Owner.
- b. Withhold Payment: The Owner may withhold payment to Supplier, in whole or in part, to the extent reasonably necessary to protect the Owner from loss on account of any breach including, without limitation, late delivery of the Goods (including Deliverables) or Work; a violation of the law by Supplier; non-conforming or defective Goods or Work not remedied; claims by a third party or evidence reasonably indicating the probable filing of claims (including, without limitation intellectual property claims, bodily injury claims, property damage claims and subcontractor payment claims); failure of Supplier to make payments to

- any Sub-Supplier; failure to purchase, at least, the minimum insurance required by this Contract; the supply of counterfeit Goods; any cost for which Supplier is responsible under this Contract; a lien or encumbrance filed against the Project that is not removed; a failure to comply with the site safety requirements; or a breach by Supplier of any warranty of this Contract. When the grounds for withholding payments are removed, payment of such withheld amounts shall be made. No interest shall be due or payable by the Owner on amounts withheld in good faith pursuant to this paragraph.
- c. Backcharge: The Owner may, at its sole discretion, backcharge and invoice to Supplier all costs it incurs arising from or related to Supplier's breach of this Contract including, without limitation, all costs to correct, repair or replace non-conforming Work not remedied by Supplier; all damage, cost or expense caused by non-conforming Work; all costs associated with lost work time, lost efficiency, idle equipment, additional overhead, and escalation; all costs associated replacing Goods that infringe a third party's intellectual property rights with non-infringing Goods; all costs related to obtaining and maintaining the insurance required by this Contract that the Supplier failed to obtain or maintain; all costs associated with removing any liens filed against the Project or related property; all fines and penalty's assessed that arise out of the Work; and all costs incurred by the Owner arising from a claim that the Work infringes a third party's intellectual property rights.
 - d. Late Delivery: If Supplier is unable to meet the required delivery schedules for any reason or if the Owner determines in reasonable judgment that Supplier is not adequately progressing the Work, then if Supplier should fail to offer a plan acceptable to the Owner to recover from such delay within five (5) Days after delivery of written notice from the Owner, the Owner may, at its sole discretion, terminate this Contract for cause; or direct Supplier to accelerate the progress of the Work including, without limitation, extending the work week, working additional shifts or overtime, and/or supplying additional manpower, equipment, facilities and other similar measures. Supplier shall be solely liable for the costs associated with such acceleration.
 - e. Intellectual Property Infringement: If any claim for infringement of intellectual property is brought against the Owner arising from the Work, Supplier shall, in order to avoid such claims, actions, or proceedings, promptly obtain a license (without additional cost to the Owner) to the intellectual property right that has been allegedly infringed; substitute at its own expense non-infringing Work; or to modify the manufacture or design of such infringing Work so the Work becomes non-infringing provided that such substitutions or modifications meet all the requirements of this Contract.
 - f. Latent Defects: Acceptance of all or part of the Work shall not deprive the Owner of the right to revoke acceptance and return any of the Goods or the right to make a claim for damages because of any non-conforming Work or later-discovered defects.
 - g. Properly Insure: If Supplier fails to obtain the insurance required by the Contract or fails to maintain coverage as required by the Contract such failure shall be a material breach and the Owner may, at its sole discretion, terminate the Contract for cause.
 - h. Not Exclusive. No remedy conferred upon or reserved to the Owner herein is intended to be exclusive of any other available remedy, but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Contract or existing at law or in equity.

16. FORCE MAJEURE

- a. In case of a force majeure event, the Party rendered wholly or partially unable to perform its obligations under this Contract will be excused from whatever performance is affected by the force majeure event to the extent so affected. The affected Party shall have an obligation to notify in writing the other Party within three (3) Days, and mitigate and work around the force majeure event to the extent commercially practicable. Supplier shall bear all of its own costs in connection with force majeure events it suffers.
- b. The following events shall not be considered force majeure:
 - i. strikes or labor disturbances involving the employees of Supplier or any of its Sub-Suppliers who are not performing Work at the Site (unless national in nature);
 - ii. price fluctuations with respect to labor or materials, supplies or components of equipment related to items to be supplied by Supplier;
 - iii. mere economic hardship; or
 - iv. fluctuations in currency exchange rates.

17. MISCELLANEOUS

- a. Claims: Except where expressly stated otherwise in this Contract, no claim for extra compensation or for additional time for performance of the Work shall be valid unless Supplier shall first have provided written notice of such claim to the Owner within three (3) Days of the start of the event giving rise to the claim. Such notice is a material consideration of this Contract and if Supplier fails to provide the Owner such notice within such time frame, Supplier's claim shall be deemed waived.
- b. Confidentiality: This Contract is confidential between the Owner and the Supplier, and the Supplier agrees that none of the information or details connected therewith shall be published or disclosed to any third party without the Owner's written permission, or otherwise provided by law.
- c. Limitations: In no event, whether based on Contract, indemnity, warranty, tort (including negligence), strict liability or otherwise shall the Owner be liable for consequential, special or indirect damages, including, without limitation, damages or losses in the nature of business interruption, loss of reputation, loss of or increased costs related to third party financing, loss of anticipated profits or anticipated revenue, or cost of capital.
- d. Assignment: Supplier shall not attempt to assign this Contract and any rights or obligations hereunder (by contract, acquisition, merger, operation of law or otherwise) in whole or in part, without the prior written consent of the Owner. Any attempt to assign any rights or obligations hereunder without appropriate consent shall be deemed void.
- e. Severability of Provisions: If any term, condition or provision of this Contract or the application thereof to any Party hereto be invalid or unenforceable at law, the offending word(s), sentence(s) or paragraph(s) shall be considered as stricken from this Contract and the remainder of this Contract, shall not be affected thereby, and each remaining term, condition and provision of this Contract shall be valid and be enforced to the fullest extent permitted by law.
- f. Survival: The obligations of the Parties hereunder which by their nature should survive the termination of this Contract or the completion of the Work hereunder, including, without limitation, those provisions of this Contract which provide for the protection against liability, shall survive and inure to the benefit of the Parties.
- g. Independent Contractor: Supplier is an independent contractor in the performance of the Work specified in this Contract. The Owner retains no control or direction over Supplier, its

-
- employees, and Sub-Suppliers or subcontractors or over the detail, manner, or methods of performance of the Work by Supplier, its employees, and sub-suppliers or subcontractors.
- h. Governing Law/Venue: The rights of all Parties hereunder and the construction of every provision hereof shall be governed by the laws of the State of Oklahoma, without giving effect to principles of conflicts of law. The Parties agree that any action arising out of this agreement or in connection with the Work shall be brought in the federal, state, or local court located in or otherwise having jurisdiction over Payne County in the State of Oklahoma and the parties hereby consent to personal jurisdiction in such courts and waive any objection based on jurisdiction or venue of any such action. Each Party waives its right to a jury trial in any court action arising among the Parties under this Contract or otherwise related to this Contract, whether made by claim, counterclaim, third party claim or otherwise.
 - i. No Waiver: Failure by the Owner to enforce any provision hereof, the Owner's failure or delay in exercising rights or remedies provided herein or by law, the Owner's approval of, acceptance of, or payment for the Work, or any part or combination thereof, shall neither relieve nor release Supplier from any of its obligations under this Contract, shall not be deemed a waiver of any rights of the Owner to insist upon strict performance hereof or of any of the Owner's rights or remedies under this Contract or by law, and shall not operate as a waiver of any of the provisions hereof.
 - j. Prior Dealings: No course of prior dealing or performance between the Owner and Supplier or usage of trade shall be relevant to supplement, explain, interpret, or modify any term, condition, or instruction used in this Contract.

EXHIBIT 1 – GUARANTEED DATES

ITEM	No Earlier Than* Delivery Date	No Later Than Delivery Date
Ventilation fans, controls, and wiring	November 15, 2015	December 15, 2015
All associated accessories and spare parts per contract.	November 15, 2015	December 15, 2015
Submittals – As Defined in 013301 Appendix A		

* Supplier may not deliver the Equipment, and Owner will not be obligated to accept delivery of the Equipment before these dates unless prior written approval is provided by Owner or CM Agent.



Stillwater Utilities Authority
Contract C4440 – Ventilation Fans
Commercial Terms & Conditions



EXHIBIT 2 – MILESTONE PAYMENT & CANCELLATION SCHEDULE

TO BE PROVIDED BY BIDDER



EXHIBIT 3 – PARTIAL WAIVER OF LIEN AND RELEASE OF CLAIMS

To: _____ and others, to the extent others have interests secured by the property of said Owner (the "Project") as identified below.

Supplier's name: _____

The Project: _____

Partial Payment Requested: \$ _____

Supplier, contingent upon the issuance, final clearance and payment of a valuable consideration of \$ _____, which is currently due and payable states that:

1. The payment amount set forth above constitutes payment in full for Supplier’s Work through the date of the last Work covered by the progress payment application for which payment is sought (“Payment Date”) on the Project excepting those claims previously made in writing to Owner and remaining unsettled as of the date of this Partial Waiver of Lien and Release of Claims.
2. Supplier represents that payment has been made to the extent of prior progress payments on the Project to all of the undersigned's sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers in connection with the performance of the Project. Supplier shall make further progress payments to its sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers out of this progress payment.

Partial Waiver and Release of Claims

NOW, THEREFORE, effective as of receipt of the payment referenced in this progress payment application, Supplier releases and waives, upon receipt of the progress payment, all claims for payment through the Payment Date, except those claims previously made in writing to Owner and remaining unsettled at the time of payment including any and all mechanic's lien rights against the Project.

Supplier: _____

By: _____

Title: _____

Date: _____



EXHIBIT 4 – FINAL WAIVER OF LIEN AND RELEASE OF CLAIMS

To: _____, and others, to the extent others have interests secured by the property of said Owner (the "Project") as identified below.

Supplier's name: _____

The Project: _____

Final Payment Requested: \$ _____

Supplier, contingent upon the issuance, final clearance and payment of a valuable consideration of \$_____, which is currently due and payable states that:

1. The payment amount set forth above constitutes payment in full for Supplier’s work on the Project excepting those claims previously made in writing to Owner and remaining unsettled at the time of final payment.
2. Supplier represents that payment has been made to the extent of prior progress payments on the Project to all of the undersigned's sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers in connection with the performance of the Project. Supplier shall make final payments to its sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers out of this final payment.

Final Waiver and Release of Claims

NOW, THEREFORE, effective as of receipt of the payment referenced in this Application, Supplier releases and waives, upon receipt of final payment, all claims for payment, except those claims previously made in writing to Owner and remaining unsettled at the time of final payment including any and all mechanic's lien rights against the Project.

Supplier:_____

By:_____

Title:_____

Date:_____

Stillwater Utilities Authority
Stillwater Energy Center
C4440 – Ventilation Fans
Burns & McDonnell Project No. 75644
Burns & McDonnell Engineering Company, Inc.
Oklahoma Certificate of Authorization No. CA-421

DOCUMENT 000005 - INDEX AND CERTIFICATION PAGE

SPECIFICATION INDEX

<u>DOCUMENT / DIVISION</u>	<u>DESCRIPTION</u>	<u>NUMBER OF PAGES</u>
23	HEATING, VENTILATING, AND AIR CONDITIONING	12

CERTIFICATION(S)

I hereby certify that this information in the document was assembled under my responsible charge. This report is not intended or represented to be suitable for reuse by others without specific verification or adaptation by the Engineer. This certification is made in accordance with the provisions of the statutes and rules of the Oklahoma State Board of Licensure for Professional Engineers and Land Surveyors.



Stillwater Utilities Authority
Stillwater Energy Center
C4440 – Ventilation Fans
Burns & McDonnell Project No. 75644
Burns & McDonnell Engineering Company, Inc.
Oklahoma Certificate of Authorization No. CA-421

DOCUMENT 000005 - INDEX AND CERTIFICATION PAGE

SPECIFICATION INDEX

<u>DOCUMENT / DIVISION</u>	<u>DESCRIPTION</u>	<u>NUMBER OF PAGES</u>
26	ELECTRICAL	7

CERTIFICATION(S)

I hereby certify that this information in the document was assembled under my responsible charge. This report is not intended or represented to be suitable for reuse by others without specific verification or adaptation by the Engineer. This certification is made in accordance with the provisions of the statutes and rules of the Oklahoma State Board of Licensure for Professional Engineers and Land Surveyors.



Attachment B

Technical Specifications & Drawings

**ATTACHMENT B
 SPECIFICATIONS & DRAWINGS**

TABLE OF CONTENTS

<u>Revision</u>	<u>SPECIFICATIONS</u>	<u>Number of Pages</u>
	DIVISION 1 – GENERAL REQUIREMENTS	
0	Section 011100 Summary of Work	5
0	Section 013210 Project Meetings, Schedules & Reports	3
0	Section 013301 Submittals	10
0	Appendix A Submittal Schedule	2
0	Appendix B Submittal Information Block	1
0	Appendix C Submittal Description	1
0	Appendix D Typical Instruction Book Cover or Operating Manual Cover and Spine Layout	1
0	Appendix E Vendor Submittal Reference Document	11
0	Section 016001 Equipment and Materials	3
0	Section 017501 Manufacturer’s Field Services	3
0	Section 017801 Contract Closeout	2
	DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING	
0	Section 237433 Dedicated Outdoor-Air Units	5
0	Section 237434 Duplex Dedicated Outdoor-Air Units	5
0	Section 239433 Data To Be Submitted With Bid – Outdoor-Air Units	2
	DIVISION 26 – ELECTRICAL	
0	Section 260002 Electrical Equipment – General Technical Requirements	3
0	Section 260551 Alternating Current Electric Motors	4

CONTRACT DRAWINGS

<u>Drawing No.</u>	<u>Rev</u>	<u>Drawing Title</u>
MH801	0	Power Block Building Auxiliary Side Make-Up Air Unit Details
MH802	0	Power Block Building Generator Side Make-Up Air Unit Details

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes basic identification of the Work covered in detail in the complete Contract.

1.02 PROJECT DESCRIPTION:

- A. The Project is a natural gas fired reciprocating engine power plant designed for 56 MW (nominal) net electric power output.
- B. The Project Site is located at 2000 E. Airport Road, Stillwater, Oklahoma 74074.
- C. Supplier is responsible for final design including Supplier's Equipment arrangement.

1.03 WORK COVERED BY CONTRACT:

- A. The Contract includes but is not limited to, engineering, designing, fabricating, factory testing, packaging, delivering, assembling, and field testing the following components of Work, which are listed for the Supplier's convenience in understanding the scope of Work:
 - 1. Furnish the following ventilation fans in manufactured housings with all controls, wiring, and accessories described herein.
 - a. MAU-P-1A
 - b. MAU-P-1B
 - c. MAU-P-2A
 - d. MAU-P-2B
 - e. MAU-P-3A
 - f. MAU-P-3B
- B. Equipment will be located outdoors. All Work shall be designed to meet the design data and Site Conditions as defined and stated herein. If located outdoors, Equipment shall meet the Outdoor Extreme Design Temperatures stated herein.
- C. The Supplier shall be responsible for furnishing all material, tools, equipment, labor, supervision, and any other incidental items or services necessary to perform all Work described herein.
- D. Supplier shall arrange and be responsible for transport of the Equipment to the Site for unloading by the installation contractor.

1.04 WORK BY OTHERS:

- A. Installation contractor will be responsible for unloading and setting the Equipment, installing foundations, furnishing all piping connections, and wiring all instruments and powered components. Installation contractor will be responsible for field-calibrating of all instruments and provide initial fills and tests all piping, instruments, and powered connections to the Equipment.

1.05 SPARE PARTS:

- A. Supplier shall include all spare parts and tools required for complete installation and commissioning of all supplied Equipment and Materials.

SECTION 011100 - SUMMARY OF WORK: continued

- B. Supplier shall provide a separately priced list of recommended spare parts for each piece of equipment.

1.06 CODES AND STANDARDS

- A. Design specifications and construction of the Project shall be in accordance with (1) applicable laws, regulations, codes and standards of the Federal Government and State of Oklahoma, including those set forth below and, (2) applicable local (including county and city) laws, regulations, codes and ordinances, including those set forth below. Publications from the following nationally recognized organizations are applicable to the engineering, design, manufacture, and testing of the Equipment included in the Specifications to the extent referenced in these Specifications. All references to publications are to the latest issue of each together with all latest addenda, amendments, or additions thereto as of the Effective Date. References shall be made in accordance with the abbreviations listed below. In the event that conflicts arise between the codes, standards of practice, specifications or manufacturer recommendations described herein and codes, laws, rules, decrees, regulations, standards, etc., of the locality where the equipment is to be installed, the more stringent code shall apply. Supplier shall provide a written position of any such conflict clarifications to Owner in writing.
- B. Federal Codes:

CAAA	Clean Air Act and Amendments
CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
NERC	North American Electric Reliability Corporation
Title 29	Code of Federal Regulations (CFR), Part 1910 Occupational Safety and Health Standards.

- C. Industry Codes:

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute 318-08
ACI	Building Code Requirements for Masonry Structures 530-05
AFPA	American Forest and Paper Association
AGA	American Gas Association
AIA	American Institute of Architects
AISC	American Institute for Steel Construction, ASD/LRFD (13th Ed.)
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCE	American Society of Civil Engineers 7-05
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ASNT	American Society of Nondestructive Testing

SECTION 011100 - SUMMARY OF WORK: continued

AWWA	American Water Works Association
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
DIN	German Standard (Deutsche Institute für Normung)
EJMA	Expansion Joint Manufacturer's Association
EN	European Standard
FCI	Fluid Control Institute
HEI	Heat Exchange Institute
HI	Hydraulic Institute
IAPWS	International Association for the Properties of Water and Steam
IBC	International Building Code 2009
IBC	Stillwater Local IRC IBC Amendments Ordinance No 3127
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IES	IES Lighting Handbook
ISA	International Society of Automation
ISO	International Standard Organization
MSS	Manufacturers Standardization Society
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
SMACNA	Sheet Metal and Air Conditioner Contractors National Association
SSPC	Steel Structures Painting Council
TEMA UFC	Thermal Insulation Manufacturers Association
UL	Underwriters Laboratories

D. County / City Codes:

Fire Marshall / AHJ	2009 International Fire Code
Building Code	Stillwater Local IRC IBC Amendments Ordinance No 3127

1.07 PROJECT SITE CONDITIONS:

A. The Project Site has the following Site Conditions:

1. Plant elevation is 930 feet above mean sea level.
2. Indoor Design Temperatures – Engine Halls, Mechanical Rooms
 - a. Maximum Dry Bulb 120°F
 - b. Minimum Dry Bulb 50°F
3. Outdoor Design Temperatures (2009 ASHRAE)
 - a. Maximum Dry Bulb (1%) 99.2°F
 - b. Mean Coincident Wet Bulb (1%) 75.3°F
 - c. Minimum Dry Bulb (99.6%) 13.6°F
4. Outdoor Extreme Design Temperatures (2009 ASHRAE)
 - a. Maximum Dry Bulb (n = 1 year) 104.2°F
 - b. Minimum Dry Bulb (n = 1 year) 5.4°F
 - c. Extreme Max Wet Bulb 88.2°F

SECTION 011100 - SUMMARY OF WORK: continued

- B. IBC Design Criteria:
1. Occupancy Category: III
 2. Wind loads – Section 1609
 - a. Basic wind speed: $V_{3S} = 90$ mph
 - b. Exposure category: C
 - c. Wind Importance Factor: $I_w = 1.15$
 - d. Minimum lateral pressure: $p_s = 10$ psf
 3. Seismic loads – Section 1613
 - a. Seismic Site Class: D
 - b. Seismic Importance Factor: $I_E = 1.25$
 - c. Component Importance Factor: $I_P = 1.0$
(per ASCE 7-05 Section 13.1)
 - d. Design Spectral Response Acceleration
 - (1) Short Period: $S_s = 0.193$
 - (2) 1 Second: $S_1 = 0.063$
 - (3) Max. considered short period: $S_{MS} = 0.309$
 - (4) Max. considered 1-second: $S_{M1} = 0.151$
 - (5) 5% damped design short period: $S_{DS} = 0.206$
 - (6) 5% damped design 1-second: $S_{D1} = 0.101$
 - (7) Long-Period Transition Period: $T_L = 12$ seconds
 - e. Seismic Design Category: B
 4. Snow loads – Section 1608:
 - a. Snow Importance Factor: $I_S = 1.1$
 - b. Ground snow load: $p_g = 10$ psf
 - c. Terrain Category: C
 5. Ice Loads
 - a. Ice thickness Importance Factor: $I_i = 1.25$
 - b. Wind Concurrent with ice Importance Factor
 $I_w = 1.0$
 - c. Nominal Ice Thickness: $t = 0.75''$
 - d. Concurrent wind speed $V_C = 40$ mph
- C. Precipitation
1. Minimum Annual: Unknown
 2. Average Annual: 37 inches
 3. Maximum Annual: Unknown
 4. Maximum 25-year 24 Hour Rain: 8 inches
 5. Maximum 24 Hour Snow: 13 inches
- D. Prevailing Wind Direction
1. Annual: South

1.08 SITE UTILITIES:

- A. Electrical:
1. AC Power: 480VAC, 3 phase, 60 Hz

SECTION 011100 - SUMMARY OF WORK: continued

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 011100

SECTION 013210 - PROJECT MEETINGS, SCHEDULES, AND REPORTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Project Meetings:
 - 1. Preliminary Conference.
 - 2. Engineering Coordination Meetings
- B. Schedules and Reports:
 - 1. Initial Coordination Submittals.
 - 2. Work Progress Schedule.
 - 3. Work Progress Reports.
- C. Related SECTIONS:
 - 1. Submittals: SECTION 013301.
 - 2. Equipment and Materials: SECTION 016001.

1.02 PROJECT MEETINGS:

- A. Preliminary Conference:
 - 1. Engineer will conduct a conference call within 10 Days after the Award Date, to review items stated in the agenda and to establish a working understanding between the parties as to their relationships during performance of the Work. The conference shall be attended by:
 - a. Supplier.
 - b. Owner.
 - c. Supplier's principal Sub-Suppliers, at discretion of Engineer.
 - d. Engineer
 - 2. Meeting Agenda:
 - a. Projected fabrication/construction schedules.
 - b. Project coordination.
 - c. Procedures and processing of:
 - d. Substitutions.
 - e. Submittals.
 - f. Change Orders.
 - g. Applications for Payment.
 - h. Procedures for testing.
 - 3. Location of Meeting: Conference Call
 - 4. Reporting: Within five (5) Days after the meeting, Engineer will prepare and distribute minutes of the meeting to each party represented.
- B. Engineering Coordination Meetings:
 - 1. Supplier shall schedule and conduct a conference call at least monthly for coordination during Supplier's equipment engineering and design phase of the Work. Meetings shall be attended by:
 - a. Supplier's representative(s) including engineering personnel.
 - b. Supplier's principal Sub-Suppliers, at Engineer's discretion.
 - c. Owner
 - d. Engineer.

SECTION 013210 - PROJECT MEETINGS, SCHEDULES, AND REPORTS: Continued

2. Meeting Agenda:
 - a. Review of action items.
 - b. Facility design interfaces.
 - c. Equipment and Material procurement status.
 - d. Engineering/fabrication/manufacturing schedules.
 - e. Requests for information (RFIs).
 3. Location of Meetings: Conference Call
 4. Reporting: Within five (5) days after the meeting, Supplier will prepare and distribute minutes of the meetings to each party represented.
- 1.03 SCHEDULES AND REPORTS:
- A. Initial Coordination Submittals: Within the time indicated in SECTION 013301 Appendix A, Supplier shall submit to Engineer:
 1. A preliminary Work progress schedule.
 2. A preliminary schedule of Submittals.
 - B. Work Progress Schedule:
 1. After submittal of preliminary Work progress schedule, submit to Engineer a detailed Work progress schedule and detailed manufacturing schedule for each piece of Equipment within the time indicated in SECTION 013301 Appendix A. Base the schedule on the preliminary Work progress schedule and incorporate review comments and other feedback.
 2. The schedule shall show the Work in a graphic format suitable for displaying scheduled and actual progress.
 - a. Prepare schedules as a horizontal bar chart with separate bar for each major portion of the Work or operation.
 - b. The schedule shall also show the Work broken down into major phases and key items with the dates Work is expected to begin and be completed. Sequence of listings shall be in the chronological order of the start of each item of Work.
 - c. Scale and spacing shall allow space for notations and revisions.
 - d. Sheet size: 8.5 x 11 or 11 x 17 inches.
 3. Provide sub-schedules to define critical portions of entire schedules.
 4. Coordinate Work progress schedule with Work progress reports and delivery schedule.
 5. Engineer will review and comment on Work progress schedule and, upon agreement between Engineer and Supplier on necessary changes:
 - a. Supplier shall print and distribute copies of the accepted schedule to Owner, Engineer, Sub-Suppliers, and other parties required to comply with scheduled dates.
 6. Supplier shall not change the accepted Work progress schedule without prior written concurrence of Engineer.
 7. Submit to Owner an updated schedule at least once a month. Schedule shall show actual progress and any proposed changes in the schedule of remaining Work.
 - C. Work Progress Reports:
 1. Submit monthly a report on actual Work progress. More frequent reports may be required should the Work fall behind the accepted schedule.

SECTION 013210 - PROJECT MEETINGS, SCHEDULES, AND REPORTS: continued

2. Work progress reports shall consist of marked copies of prints made from the accepted Work progress schedule, and a narrative report which shall include but not be limited to the following:
 - a. A description of current and anticipated delaying factors, if any.
 - b. Impact of possible delaying factors.
 - c. Proposed corrective actions.
3. A Work progress report shall accompany each application for partial payment. Work reported complete but not readily apparent to Owner must be substantiated with supporting data.
4. Should operations fall behind accepted schedule to an extent that Supplier's ability to meet the Guaranteed Delivery Dates appears doubtful to Owner, Owner shall so notify Supplier, and Supplier shall, at no change in Contract Price, take corrective action to get back on schedule, and submit an updated Work progress report to Owner.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 013210

SECTION 013301 - SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes definitions, descriptions, transmittal, and review of Submittals.
- B. Related SECTIONS:
 - 1. Contract Closeout: SECTION 017801.

1.02 GENERAL INFORMATION:

- A. Definitions:
 - 1. Shop Drawings, Product Data, and Samples are technical Submittals are defined below and are prepared by manufacturer or Supplier and submitted by Supplier to Engineer as a basis for review and approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each DIVISION of the Specifications.
 - a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
 - b. Product Data includes standard printed information on materials, Products, and systems; not custom-prepared for this Contract, other than the designation of selections from available choices.
 - c. Samples include both fabricated and unfabricated physical examples of Materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or for more detailed testing and analysis. Mockups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
 - 2. Informational Submittals are those technical reports, administrative Submittals, certificates and guarantees not defined as Shop Drawings, product data, or Samples.
 - a. Technical reports include laboratory reports, tests, technical procedures, technical records, and Supplier's design analysis.
 - b. Administrative Submittals are those nontechnical Submittals required by the Contract or deemed necessary for administrative records. These Submittals include maintenance agreements, bonds, photographs, physical work records, statements of applicability, copies of industry standards, Contract record data, schedules, security/protection/safety data, and similar type Submittals.
 - c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
 - 3. Refer to ARTICLES 1.03 and 1.04 of this PART for detailed lists of documents and specific requirements.
- B. Quality Requirements:
 - 1. Shop Drawings and Product Data shall be submitted in electronic format. Every line, character, and letter shall be clearly legible and of suitable quality for reproduction.

SECTION 013301 - SUBMITTALS: continued

2. Documents submitted to Owner and Engineer that do not conform to specified requirements shall be subject to rejection by Owner and Engineer, and upon request, Supplier shall resubmit conforming documents. Documents rejected due to illegibility or failure to comply with non-technical requirements will not satisfy schedule requirements. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Supplier's failure to initially satisfy the legibility quality requirements will not relieve Supplier from meeting the required schedule for Submittals.
 3. Supplier shall be notified of any Submittals rejected prior to review for legibility or formatting reasons by Engineer or Owner. No notification will be provided for Submittals which are not rejected.
- C. Language and Dimensions:
1. All words and dimensional units shall be in the English language.
 2. Metric dimensional unit equivalents may be stated in addition to the English units. However, English units of measurement shall prevail.
- D. Submittal Completeness:
1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.
 2. Where standard drawings are furnished which cover a number of variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks or X-outs to clearly indicate variations, optional equipment, or other items which do not apply to the Submittal and circle or box all selected variations, optional equipment, or other applicable selections. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Such annotation shall also include proper identification of the Submittal permanently attached to the drawing.
 3. Reproduction or copies of Contract drawings or portions thereof will not be accepted as complete fabrication or erection drawings, but will be acceptable when used by Supplier as a drawing upon which to indicate information on erection or to identify detail drawing references. Whenever the Contract drawings are revised to show that additional Supplier's information, Engineer's title block shall be replaced with Supplier's title block, and Engineer's professional seal shall be removed from the drawing.
- E. Form of Submittals:
1. Supplier shall have one contact person for submitting and retrieving documents.
 - a. This person will be responsible for making sure all documents are submitted properly.
 - b. This person will be receiving an email every week stating what needs to be resubmitted.
 - (1) All submittals with an action status of "B", "C", or "D" need to be resubmitted as described herein.
 2. Submittal Documents
 - a. Name of file must include:
 - (1) Specifications SECTION number in front of filename

SECTION 013301 - SUBMITTALS: continued

- (2) Must be short and specific to the file
 - b. Name of file must NOT include:
 - (1) Revision number/letter
 - (2) Date
 - (3) The word “Submittal”
 - c. All documents that are supplied by the Supplier must be .PDF formatted
 - d. A Submittal Block will be provided to Supplier as a .JPEG file.
 - e. The submittal block must be included on:
 - (1) Each individual PDF drawing. (one drawing per PDF file)
 - (2) The first page of each document that is NOT a drawing.
 - f. When submitting:
 - (1) See Appendix E for submittal instructions on the Webtools site.
 - (2) Send a transmittal letter by email to: 75644@burnsmcd.com, with cc: dpetersen@burnsmcd.com and msarceda@burnsmcd.com.
 - (3) On the transmittal letter:
 - 1) Include a description for each file
 - 2) State what revision the file is.
 - (4) State the project number (75644), project description, Contract number CXXXX (where ‘XXXX’ is to be replaced by the actual 4 digit number), and the number indicating the submittal number (1, 2, 3, etc.) within the e-mail
 - g. Return Submittal:
 - (1) Make sure the file name has stayed exactly the same as when you first submitted it.
 - (2) Pick up any of Engineer’s comments and make the necessary changes to the original document/drawing.
 - (3) If you are making a change or verifying information on any document, provide comment clouding on these items.
 - (4) If the Engineer has made comments and you need to add or delete pages from your original document:
 - (a) Place an “X” through the page to delete it
 - (b) Add additional pages to the end of the PDF.
- 3. Document Pick-Up
 - a. Supplier will receive an e-mail stating that your package is ready to be picked up.
 - b. Click on the Webtools link.
 - c. Download the package.
 - (1) Included in the package are:
 - (a) A return transmittal letter listing the document being returned and what action status they are given.
 - (b) Documents that are being returned with the submittal block filled out.
 - d. Pick-up or respond to all comments from the Engineer.
 - e. Resubmit any required documents as described above. Cloud all changes and increase the revision for all resubmitted documents.

1.03 TECHNICAL SUBMITTALS:

- A. Provide required Submittals as specified in Appendix A and in the Specifications. Additional information about Submittals listed in Appendix A is provided in Appendix C. All durations are Days.
- B. Schedule of Submittals:

SECTION 013301 - SUBMITTALS: continued

1. Prepare for Engineer's concurrence a schedule for submission of all Submittals specified or necessary for Engineer's approval of the use of Equipment and Materials proposed for incorporation in the Work or needed for proper installation, operation, or maintenance. Submit the schedule with the Work progress schedule. Schedule submission of all Submittals to permit review, fabrication, and delivery in time to not cause delay in the Work of Supplier or its Sub-Suppliers or any other contractors as described herein.
 2. In establishing schedule for Submittals, allow 14 Days in Engineer's office for reviewing original submittals and 14 Days in Engineer's office for reviewing resubmittals. For submittals exceeding 20 drawings, Engineer and Owner may request additional time for review within 2 days of submittal receipt.
 3. Submittals requiring revision shall be resubmitted within 14 Days after receipt of Engineer's review notations.
 4. The schedule shall indicate the anticipated dates of original submission for each item and Engineer's approval thereof, and shall be based upon at least one resubmission of each item.
 5. Schedule all Submittals required for submission within the time specified for each in Appendix A.
 6. Resubmit Submittals the number of times required for Engineer's action stamp to read either A, F, or G as described below. However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining approval of Submittals, will not be grounds for extension of the Contract Time provided Engineer completes its reviews within the times specified. Supplier shall not commence production of any part of the Equipment and Materials affected thereby until such Submittal has been reviewed and approved by Engineer.
- C. Transmittal of Submittals:
1. All Submittals (shop drawings, product data, and samples) for Equipment and Materials furnished by manufacturers and Supplier shall be submitted to Engineer by Supplier.
 2. Transmit all Submittals to Engineer for approval as follows:
 - a. Include Submittal Information Block:
 - (1) Electronic files of Submittal Information Blocks will be provided to Supplier for use on electronic Submittals.
 - (2) An example of the Submittal Information Block is included as Appendix B to this Section.
 - b. Mark each Submittal by Project name and number, Contract title and number, and the applicable Specifications SECTION and Article numbers.
 - c. Check and include Supplier's approval for Submittals of Supplier and manufacturers prior to transmitting them to Engineer. Supplier's approval shall constitute a representation to Owner and Engineer that Supplier has determined and verified all design criteria, quantities, dimensions, materials, catalog numbers, compliance with applicable laws and regulations, and similar data, or Supplier assumes full responsibility for doing so, and that Supplier has coordinated each Submittal with the requirements of the Work and the Contract.

SECTION 013301 - SUBMITTALS: continued

- d. At the time of each submission, call to the attention of Engineer in the transmittal letter any deviations from the requirements of the Contract.
 - e. Make all modifications noted or indicated by Engineer and return revised Submittals until approved. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by Engineer on previous Submittals. Previously approved Submittals transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.
 - f. Resubmitted files shall be indicated on the transmittal letter by a later date and revision number than the previous submissions.
 - g. Following completion of the Work and prior to final payment, furnish record documents and approved Samples and Shop Drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. Furnish additional copies for insertion in Equipment instruction books and operating manuals as required. All such copies shall be clearly marked "PROJECT RECORD."
 - (1) Submit a final record copy of a master field drawing list which shall indicate the final revision status of each drawing on the list.
3. Quantity Requirements:
- a. Except as otherwise specified in Appendix A, transmit all Shop Drawings in the following quantities:
 - (1) Initial Submittal:
 - (a) Per Appendix A, this Section.
 - (2) Resubmittals:
 - (a) Per Appendix A, this Section.
 - (3) Submittal for final distribution:
 - (a) Paper - One copy to Owner, One copy to Engineer.
 - (b) Electronic - One CD-ROM or flash drive copy to Engineer in native format. Drawings shall be provided as AutoCAD 2012 or later files.
 - (4) As-constructed documents:
 - (a) Paper - One copy to Owner, one copy to Engineer.
 - (b) Electronic - Three CD-ROM or flash drive copies to Engineer in native format. Drawings shall be provided as AutoCAD 2012 or later files.
 - b. Transmit Submittals of product data as indicated for Shop Drawings above.
 - c. Transmit Submittals of Material Samples, color charts, and similar items as follows:
 - (1) Initial Submittal – Two to Engineer. One to Owner.
 - (2) Resubmittal – Two to Engineer. One to Owner.

SECTION 013301 - SUBMITTALS: continued

- (3) Upon approval, Sample(s) will not be returned to Supplier.
 - d. Except as otherwise specified in Appendix A, transmit Submittals of Equipment instruction books and operating manuals as follows:
 - (1) Initial Submittal:
 - (a) Paper - No copies to Engineer. One copy to Owner. Only Engineer's comments will be returned to Supplier.
 - (b) Electronic - One copy to Engineer. One copy to Owner.
 - (2) Resubmittals:
 - (a) Paper - No copies to Engineer. One copy to Owner. Only Engineer's comments will be returned to Supplier.
 - (b) Electronic - One copy to Engineer. One copy to Owner.
 - (3) Submittal for Final Distribution:
 - (a) Four paper copies to Owner upon Engineer's written authorization.
 - (b) One CD-ROM or flash drive copy to Engineer as PDF files and Two CD-ROM or flash drive copies to Owner.
 - e. All Submittals provided in PDF format shall contain searchable text.
 - f. When all Submittals have been updated to "as-constructed" conditions, transmit to Engineer three copies and Owner five copies each of manuals on CD-ROM.
 - g. Owner may copy and use for internal operations and staff training purposes any and all document Submittals required by this Contract and approved for final distribution, whether or not such documents are copyrighted, at no additional cost to Owner. If permission to copy any such Submittal for the purposes stated is withheld from Owner by manufacturer or Supplier, the Supplier shall provide to Owner 50 copies plus the number of copies required by Supplier at each final distribution issue.
 4. Supplier's erection drawings and other Submittals required for installation of Equipment furnished under this Contract for installation under other contracts will be transmitted electronically to installing contractor by Engineer in the final distribution of such Submittals.
 5. Information to Manufacturer's District Office: Supplier shall arrange for manufacturers and suppliers of Equipment or Materials to furnish copies of all agreements, drawings, specifications, operating instructions, correspondence, and other matters associated with this Contract to the manufacturer's district office servicing Owner. Insofar as practicable, all business matters relative to Equipment and Materials included in this Contract shall be conducted through such local district offices.

D. Engineer's Review:

 1. Engineer will review and take appropriate action on Submittals in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if items of Equipment and Materials covered by the Submittals are compatible with the design concept and conform to information given in the Contract.

SECTION 013301 - SUBMITTALS: continued

2. Such review and approval will not extend to design data reflected in Submittals which is peculiarly within the special expertise of Supplier. Review and approval of a component item as such will not indicate approval of the assembly in which the item functions.
 3. Engineer's review and approval of Shop Drawings, product data, or Samples will not relieve Supplier of responsibility for any deviation from requirements of the Contract Documents unless Supplier has in writing called Engineer's attention to such deviation at the time of submission, and Engineer has given written concurrence in and approval of the specific deviation. Approval by Engineer shall not relieve Supplier from responsibility for errors or omissions in Submittals.
- E. Submittal Action Stamp:
1. Engineer's review action stamp, appropriately completed, will appear on all Submittals of Supplier when returned by Engineer. Review status designations listed on Engineer's action stamp are defined as follows:

A - SUBMITTAL APPROVED Signifies Equipment or Material represented by the Submittal conforms to the design concept and complies with the intent of the Contract and is approved for incorporation in the Work. Supplier is to proceed with fabrication or procurement of the items and with related Work. Copies of the Submittal are to be transmitted to Engineer for final distribution.

B - SUBMITTAL APPROVED AS NOTED (RESUBMIT) Signifies Equipment or Material represented by the Submittal conforms to the design concept and complies with the intent of the Contract and is approved for incorporation in the Work in accordance with Engineer's notations. Supplier is to proceed with fabrication or procurement of the items and with related Work in accordance with Engineer's notations and is to submit a revised Submittal responsive to notations marked on the returned Submittal or written in the letter of transmittal.

C - SUBMITTAL RETURNED FOR REVISION (RESUBMIT) Signifies Equipment or Material represented by the Submittal appears to conform with the design concept and comply with the intent of the Contract but information is either insufficient in detail or contains discrepancies which prevent Engineer from completing its review. Supplier is to resubmit revised information responsive to Engineer's annotations on the returned Submittal or written in the letter of transmittal. Fabrication or procurement of items represented by the Submittal and related Work is not to proceed until the Submittal is approved.

D - SUBMITTAL NOT APPROVED (SUBMIT ANEW) Signifies Equipment or Material represented by the Submittal does not conform to the design concept or comply with the intent of the Contract and is disapproved for use in the Work. Supplier is to provide Submittals responsive to the Contract.

E - PRELIMINARY SUBMITTAL Signifies Submittals of such preliminary nature that a determination of conformance with the design concept or compliance with the intent of the Contract must be deferred until additional information is furnished. Supplier is to submit such additional information to permit layout and related activities to proceed.

SECTION 013301 - SUBMITTALS: continued

F - FOR REFERENCE, NO APPROVAL REQUIRED Signifies Submittals which are for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, bulletins and similar data, all of which are useful to Engineer or Owner in design, operation, or maintenance, but which by their nature do not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract. Engineer reviews such Submittals for general content but not for basic details.

G - DISTRIBUTION COPY (PREVIOUSLY APPROVED) Signifies Submittals which have been previously approved and are being distributed to Supplier, Owner, and others for coordination and construction purposes.

F. Instruction Books and Operating Manuals:

1. In addition to electronic Submittals specified above, Equipment instruction books and operating manuals prepared by the manufacturer shall include the following:
 - a. Index and tabs.
 - b. Instructions for installation, start-up, operation, inspection, maintenance, parts lists and recommended spare parts, and data sheets showing model numbers.
 - c. Applicable drawings.
 - d. Warranties and guarantees.
 - e. Name and address of nearest manufacturer-authorized service facility.
 - f. All additional data specified.
2. Each hard copy of the manuals shall be assembled and bound in black three-ring binders designed for rough usage. Binders shall be as specified below.
 - a. Front covers and spine of the manuals shall be permanently marked with white lettering indicating Owner's name, plant name, unit number, name of equipment, volume number if applicable, contract number, name of Supplier, Supplier's address, and year of manufacture. See Appendix D of this SECTION for more details.

Manufacturer	ViaTech Publishing Solutions or approved equal 424 North Cedarbrook Avenue Springfield, Missouri 65802 1-800-888-0823
Binder type	Swing Hinge C78 Split Prong
Construction	Stiff binder board
Covering	Supported vinyl skytogen liner
Material and color	Black imitation leather (Material Code NV899)
Font	News Gothic Condensed
Imprinting	Foil stamp in accordance with Appendix D of this section. Imprinting color is to be white.

SECTION 013301 - SUBMITTALS: continued

Capacities available Split prong swing hinge 2 inch or 3 inch as required.

- b. Binder capacities shall not exceed 3 inches, nor shall material included exceed the designed binder capacity. If material to be bound exceeds capacity rating, multiple volumes shall be furnished. Binder capacity should not be more than approximately ½- inch greater than the thickness of the material within the binder.
- c. Submit mockup of cover and spine for Engineer's review.

G. Samples:

- 1. Office Samples shall be of sufficient size and quantity to clearly illustrate the following:
 - a. Functional characteristics of the product, with integrally related parts and attachment devices.
 - b. Full range of color, texture, and pattern.
 - c. Material, manufacturer, pertinent catalog number, and intended use.

1.04 INFORMATIONAL SUBMITTALS:

A. Informational Submittals are comprised of technical reports, administrative Submittals, and guarantees which relate to the Work, but do not require Engineer approval prior to proceeding with the Work. Informational Submittals include:

- 1. Test reports.
- 2. Certification on Materials:
 - a. Steel mill tests.
- 3. Shipping and/or packing lists.
- 4. Job progress schedules.
- 5. Equipment and Material delivery schedules.
- 6. Warranties and guarantees.
- 7. Welder qualification records.
- 8. Welding procedures qualification tests.
- 9. X-ray and radiograph reports.
- 10. Hydrostatic testing.

B. Transmittal of Informational Submittals:

- 1. All informational Submittals furnished by manufacturers and suppliers shall be submitted to Engineer by Supplier unless otherwise specified.
 - a. Identify each informational Submittal by Project name and number, Contract title and number, and the Specifications SECTION and Article numbers marked thereon or in the letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
 - b. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from the requirements of the Contract.

SECTION 013301 - SUBMITTALS: continued

2. Quantity Requirements:
 - a. Technical reports and administrative Submittals except as otherwise specified:
 - (1) Paper: One copy each to Engineer and Owner.
 - (2) Electronic: One copy each to Engineer and Owner.
 3. Test Reports:
 - a. Responsibilities of Supplier, Owner, and Engineer regarding tests and inspections of Equipment, Materials, and completed Work are set forth elsewhere in this Contract.
 - b. The party specified responsible for testing or inspection shall in each case, unless otherwise specified, arrange for the testing laboratory or reporting agency to distribute one electronic copy of the test reports to Owner, Engineer, and Supplier.
- C. Engineer's Review:
1. Engineer will review informational Submittals for indications of Work or Material deficiencies.
 2. Engineer will respond to Supplier on those informational Submittals which indicate Work or Material deficiency.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 013301

**APPENDIX A
SUBMITTAL SCHEDULE**

LEGEND: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order

ID	Description	Subj. To LD's	With Proposal (for bid evaluation and award)	For Approval (required prior to fabrication)	For Information / Certification / Construction (conformed including Owner's and Engineer's comments)
1	Notice of Shipment				E – 30 days prior to shipment
2	Recommended Installation & Commissioning Spare Parts		E		
3	Recommended Two-Year Maintenance Spare Parts		E		
4	Preliminary Manufacturing Schedule for each piece of equipment				E – 10 days ARO
5	Schedule of Submittals		E	E – 7 days ARO	
6	Detailed Manufacturing Schedule with milestones				E – 10 days ARO
7	Detailed drawing list with submittal dates				E – 30 days ARO
8	Detailed Work Progress Schedule			E – 14 days ARO	
9	Installation Manuals (include a list of items proposed to be shipped loose)			E – 60 days prior to Contract Delivery Date	P (4), E – 30 days prior to Contract Delivery Date
10	Operating Manuals			E – 60 days prior to Contract Delivery Date	P (4), E – 30 days prior to Contract Delivery Date
11	Packing Lists		E		P (1) – With each shipment
12	Bills of Materials			E – 60 days ARO	
13	Unloading, Handling & Storage Requirements and Procedures				P (1), E – With Notice of Shipment
14	Material Safety Data Sheets (if applicable)				P (4), E – With Notice of Shipment and with each Shipment
15	General Arrangement and Outline Drawings with Dimensions, Weights, Fluid Quantity, materials of construction, recommended maintenance clearances, surface preparation and painting information		E	E – 14 days ARO	E – 30 days ARO
16	Anchor bolt size and arrangement			E – 14 days ARO	E – 30 days ARO
17	Nameplate Drawing				E – 30 days ARO
18	Electrical Schematic			E – 14 days ARO	E – 30 days ARO
19	Interconnection Wiring Diagrams			E – 14 days ARO	E – 30 days ARO
20	Control Panel Front View & Internal Wiring Diagram			E – 14 days ARO	E – 30 days ARO

**APPENDIX A
SUBMITTAL SCHEDULE**

LEGEND: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order

ID	Description	Subj. To LD's	With Proposal (for bid evaluation and award)	For Approval (required prior to fabrication)	For Information / Certification / Construction (conformed including Owner's and Engineer's comments)
21	System I/O List		E	E – 14 days ARO	E – 30 days ARO
22	Control Logic Diagrams and Interface details for Owner's PLC		E	E – 30 days ARO	E – 30 days ARO
23	All Other Drawings				E – 30 days ARO

APPENDIX B

SUBMITTAL INFORMATION BLOCK

Supplier to fill in all blanks
without preprinted information

For the use of Engineer

<p>Project Supplier Identification</p> <p>Supplier: _____</p> <p>Project Name: _____</p> <p>Project No.: _____</p> <p>Contract Title: _____</p> <p>Contract No.: _____</p> <p>Spec. Section No.: _____</p> <p>Supplier's Approval: Submission of this document shall represent contractor's approval as specified in the Contract. Supplier remains liable for accuracy of Submittals as provided in the Contract.</p>	<p>Date Engineer Received</p> <hr/> <p>Engineer's Action (See Contract Documents)</p> <table><tr><td>Initials & Date</td><td>Initials & Date</td></tr><tr><td>A _____</td><td>E _____</td></tr><tr><td>B _____</td><td>F _____</td></tr><tr><td>C _____</td><td>G _____</td></tr><tr><td>D _____</td><td></td></tr></table>	Initials & Date	Initials & Date	A _____	E _____	B _____	F _____	C _____	G _____	D _____	
Initials & Date	Initials & Date										
A _____	E _____										
B _____	F _____										
C _____	G _____										
D _____											

1. Use this decal on all shop drawings, whether prepared by Supplier or Sub-Supplier. Place as near as possible to the drawing title in the lower right corner.
2. Affix the gummed edge paper information blocks to all "product data" type Submittals immediately inside the front cover.

APPENDIX C

SUBMITTAL DESCRIPTION

System I/O list

- Tabulation of all inputs and outputs associated with a PLC or DCS to be used to control the supplied system.

Electrical Schematic

- Detailed schematics showing each and every light, switch, controller, relay, timer, etc., associated with a systems control circuit
- All voltage and current ratings
- Special wiring requirements (coax, high temp., etc.)

Control Panel Front View & Internal Wiring Diagram

- Physical diagrams of all supplied control panels (internal and external)
- All light and switches including color
- All wiring internal to the panel
- All Tagging/Labeling
- Panel NEMA rating

Electrical Load List

- Tabulation of all motors (load in hp)
- Tabulation of all variable speed drives (load in kW)
- Tabulation of all 120V vital ac loads (load in kW)
- Tabulation including hp, voltage, and number of phases

Electrical Equipment Layout

- Physical drawing showing the location of each of the electrical interface points and elevation of equipment in respect to the plant elevation
- Location of each device that requires Owner's cable to be run to it

Equipment Installation Details

- Drawings showing how to install all devices that require field installation
- Details including support/mounting devices
- Instrument installation details including tubing installation from root valve to the instrument including tubing size, slope, valve manifold, etc.

Interconnection Wiring Diagrams

- Overall system diagram showing 100% of the field wiring required
- Interface of each device or panel being supplied in the system
- Voltage and current ratings

Control Logic Diagrams

- Normal start/stop sequence
- Alarm development
- Identification of all time delays
- Auto stop/start sequence
- Identification of digital control
- Identification of analog control

P&ID's

- System diagrams of all system piping
- Identification of all instruments, pressure switches, limit switches, temperature elements, etc.
- Identification of interface (PLC, DCS, or hard wired interlocks) for each device
- Identification of valves, pumps, etc.
- Identification of all pipe size, materials, and schedule

General Arrangement Drawings

- Dimension and location (plan and elevation) of all equipment including locating dimensions in respect to the plant columns and elevation of equipment in respect to the plant elevation
- Identification of all pull space requirements
- Identification of all access/maintenance requirements

Foundation Details

- Foundation details/outlines depicting overall dimensions, pad and blockout requirements, anchor bolt locations and details, and any

additional information necessary to establish the foundation arrangement

- Either actual or "not-to-exceed" foundation design loads, and their points of application, for all applicable load cases and/or combinations (i.e., dead load, live load, wind, seismic, dynamic, etc.)
- Identification of loading directions, magnitudes, and any other permanent data required for the foundation design

Structural and Miscellaneous Steel

- Certified shop drawings and erection diagrams for all structural steel and miscellaneous steel
- Documents prepared in accordance with the AISC specification for the design, fabrication, and erection of structural steel for buildings

Outline Drawings

- Outline dimensional drawing
- Location of all interface connections (plan and elevation)
- Recommended/required mounting details clearly depicting bolting location, size, material, and projection requirements, or sufficient data such that the Engineer can establish such requirements (for dynamic equipment or machinery data include operating speeds, rotating masses, centers-of-gravity, eccentricities, etc.)
- Weight and center of gravity
- Type of interface connection (e.g., 150 lb. RF flange, welded, weld end preparation, wall thickness or schedule, etc.)
- Allowable loads for all nozzles
- Removal space/maintenance requirements
- Special rigging requirements
- Thermal movements of all nozzles (if applicable)

Piping Information

- Physical drawing showing the routing of all vendor supplied pipe
- Location of pumps, valves, traps, strainers, instrument connections, etc. on the piping drawing
- Location of all Owner/Vendor interface points (plan and elevation) for large and small pipe
- Drawing including locating dimensions in respect to the plant columns and elevation or centerline of equipment
- Allowable loads and movements for all interface points
- Support locations and details
- Identification of pipe sizes, materials, valves, pumps, insulation, etc.
- Field weld locations
- Wall/floor penetration requirements
- Pipe movements in excess of 1 inch
- Design/service conditions (temperature/pressure)

O & M Manuals

- Description of equipment
- Theory of operation
- Troubleshooting
- Equipment drawings
- Installation instructions
- Maintenance instructions
- Sub-supplier component list

APPENDIX D

TYPICAL INSTRUCTION BOOK COVER

NAME OF EQUIPMENT	Owner's Name	36
Owner's Name	Owner's Facility or Plant Name	24
Owner's Facility Name	INSTRUCTION BOOK FOR NAME OF EQUIPMENT VOLUME NUMBER*	36 36 36 36
CONTRACT NUMBER XXXX	CONTRACT NUMBER XXXX	24
VOLUME NUMBER*	SUPPLIER'S NAME SUPPLIER 'S ADDRESS SUPPLIER'S ORDER NUMBER	24 24 24
	Equipment Tag Number(s)	24
(Spine)	(Cover)	

NOTES:

1. All lettering shall be a block style font such as Arial.
2. All spine lettering shall be 14 point.
3. Cover lettering shall be point sizes indicated in column to right of cover illustration.
4. *Volume number required only if instructions are contained in more than one volume

Appendix E

Vendor Submittal Reference Document



Overview:

The following procedure is for vendors, suppliers, or contractors who will be issuing submittals to Burns & McDonnell (BMcD). If you have questions about uploading submittals, please email or call your BMcD contact.

It is a step by step guide on:

- Login options
 - Logging in
 - Resetting the Password
 - Forgotten Passwords
- Preparing and Delivering a Submittal
 - Creating a Submittal
 - Notification of Receipt
- Picking up a Reviewed or Rejected Submittal
 - Notification of Completed/Rejected Documents
 - Download of Completed/Rejected Documents

Appendix E

Vendor Submittal Reference Document



Logging In:

Log into BMcD WebTools at <http://webtools.burnsmcd.com> using the username and password sent to you by Burns and McDonnell's IT support group.

Note: Accounts are user specific. Do not share the username and password. Others who wish to access the system should request a separate account.

Previously you were not able to change the password you received, but now it can be reset after using the initial password from BMcD. After changing the password it cannot be changed again for 24 hours. Previously used passwords cannot be used again. The Domain is BMCDEXT and should preface your username.

To Login:

The Domain is BMCDEXTand should be typed in before the user name. **Example: BMCdext\[user ID]** so the information would be **BMcDEXT\ext_jdoe**.

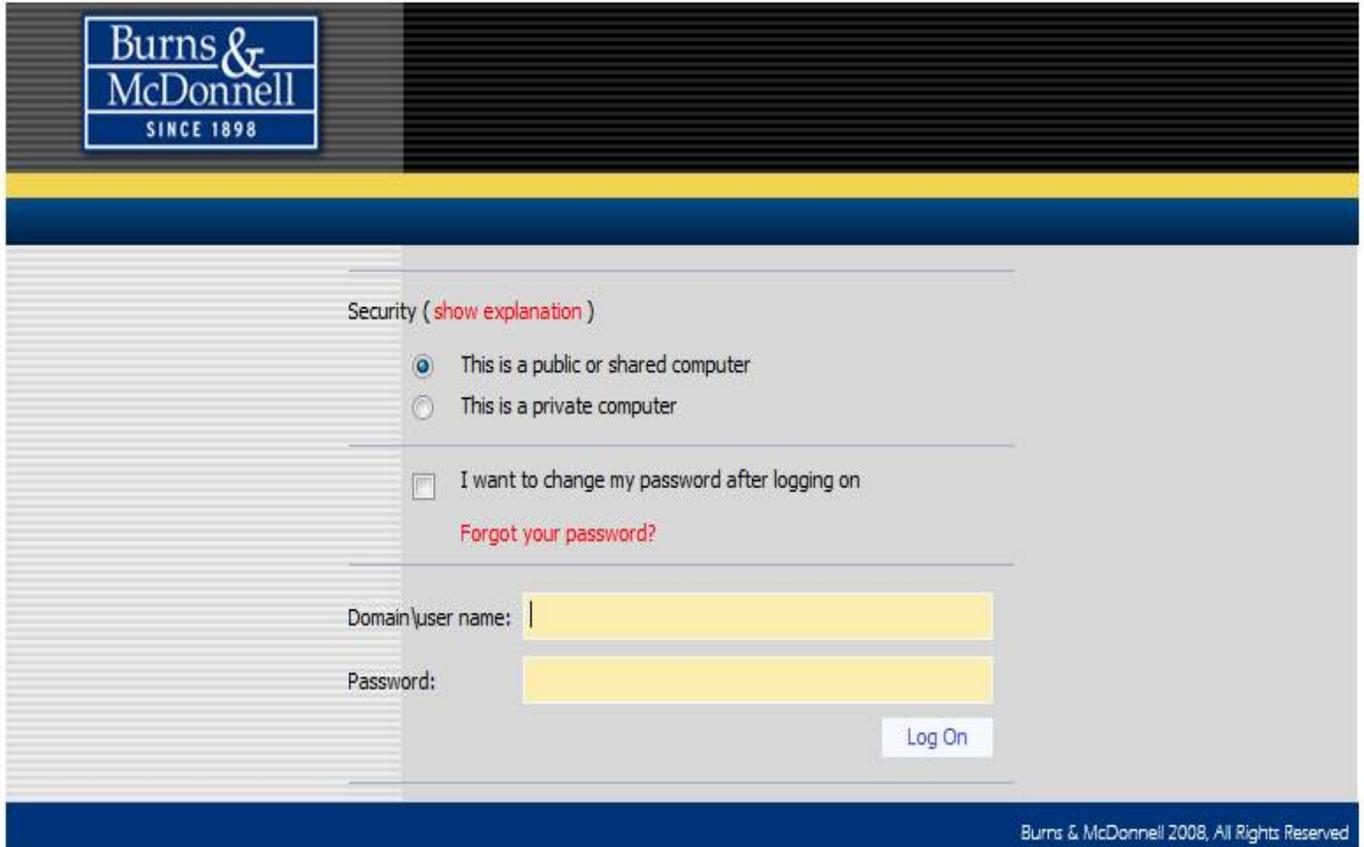
- a. You may change your password by checking the box for I want to change my password after logging on.
- b. If you forgot your password you can have a new password sent to you by clicking the "Forgot your password?"

Appendix E

Vendor Submittal Reference Document



Login Screen:



Burns & McDonnell
SINCE 1898

Security ([show explanation](#))

This is a public or shared computer

This is a private computer

I want to change my password after logging on

[Forgot your password?](#)

Domain\user name:

Password:

Log On

Burns & McDonnell 2008, All Rights Reserved

Appendix E Vendor Submittal Reference Document



Set New Password screen:

The screenshot shows a web interface for setting a new password. At the top left is the Burns & McDonnell logo. Below it, there are three input fields: 'Old password:', 'New password:', and 'Confirm new password:'. Each field has a yellow rectangular input area. Below the input fields are two buttons: 'Change Password' and 'Continue'. The bottom right corner of the screen displays the text 'Burns & McDonnell 2008, All Rights Reserved'.

- The new password must meet BMcD password requirements:
- The password has to be at least eight characters long.
- The password must contain characters from at least three of the following categories:
 - English uppercase characters (A - Z)
 - English lowercase characters (a - z)
 - Base 10 digits (0 - 9)
 - Non-alphanumeric (For example: !, \$, #, or %)
 - The password cannot contain three or more characters from the user's account name.

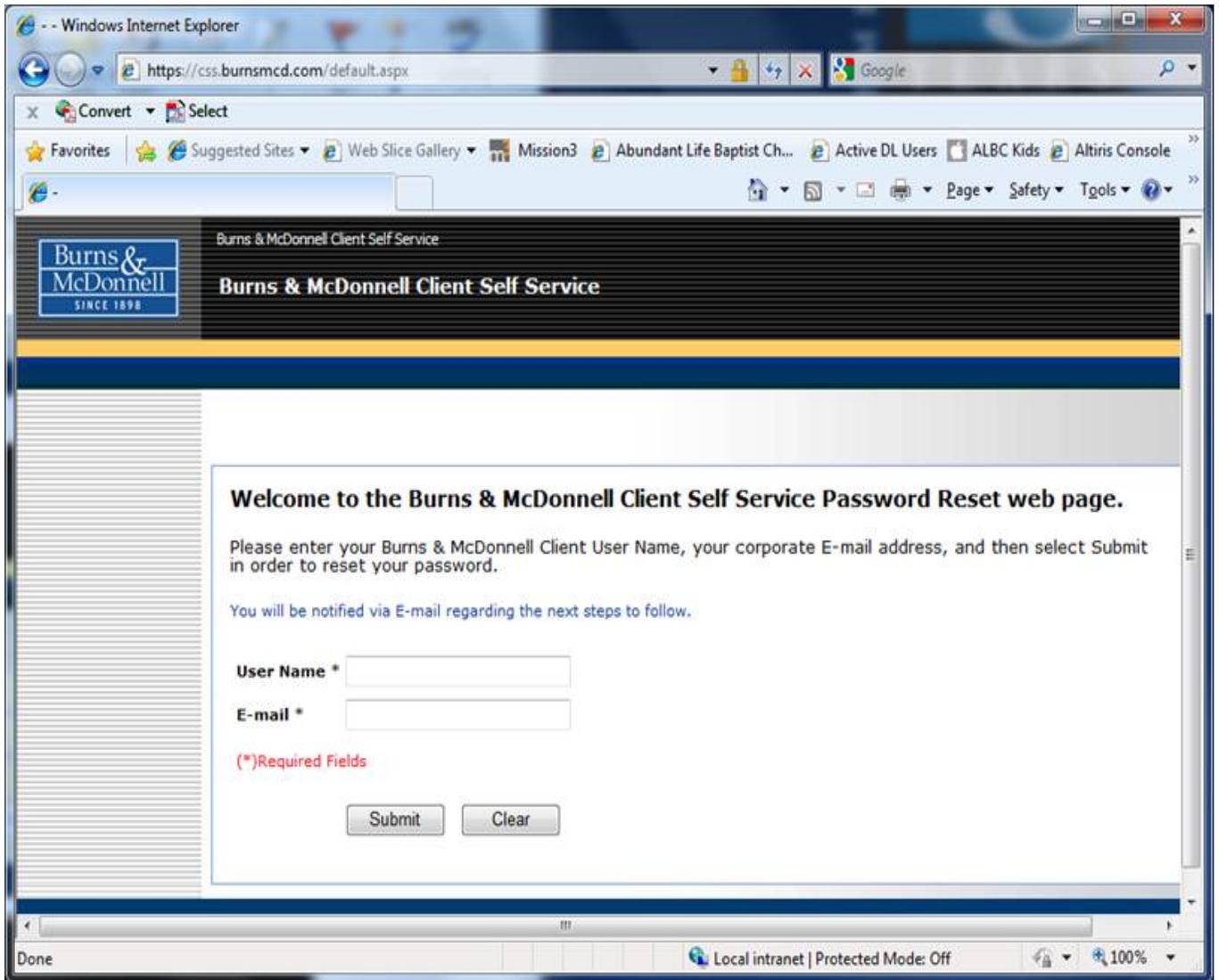
Appendix E

Vendor Submittal Reference Document



If you forgot your password you can have a new password sent to you by clicking the “Forgot your password”. If so, the following screen will appear for requesting a new password.

Request New Password screen:



Appendix E

Vendor Submittal Reference Document



Creating a Submittal:

If your password does not need to be changed, use your current User ID and Password to log into WebTools.

Your username and password information will be automatically populated into the BMCD Login screen.

- To create a submittal click in the Project/Program text box and fill in with the appropriate project name or program number, then click Create Submittal. If a reminder of the appropriate project number is needed, log in to WebTools and view the available project number folders. By clicking on the “Documents” folder the list of available project number will be seen. Descriptions of those projects will be given on the right hand window pane. After the proper project number is verified, log back out to return to the Create Submittal option.

Note: When creating a Submittal, the Repository information is not needed.

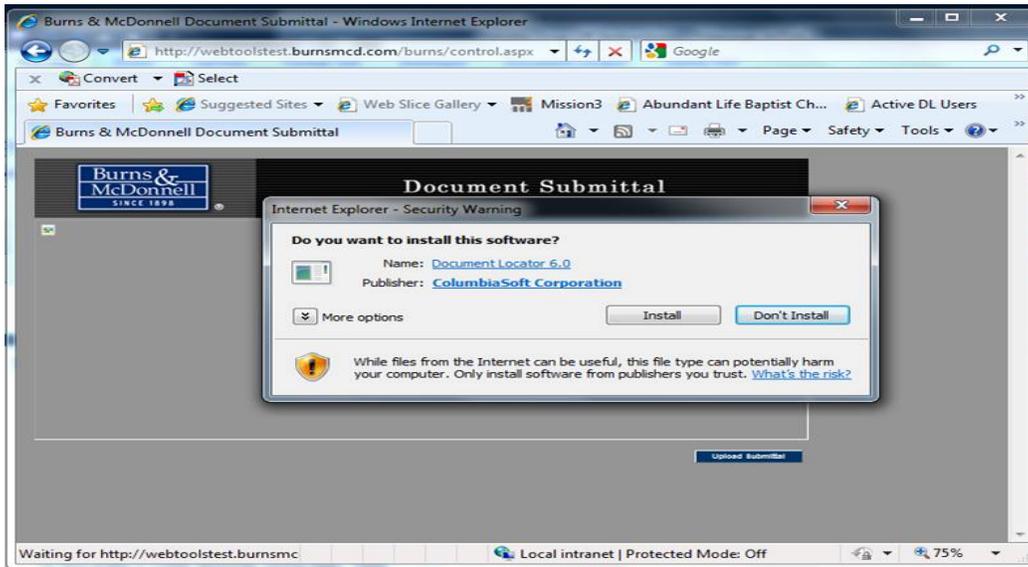
If the number is incorrectly entered the following error message will be displayed. Check the number, if you believe you received this message in error you will need to contact your BMCD Document Control contact.

Appendix E

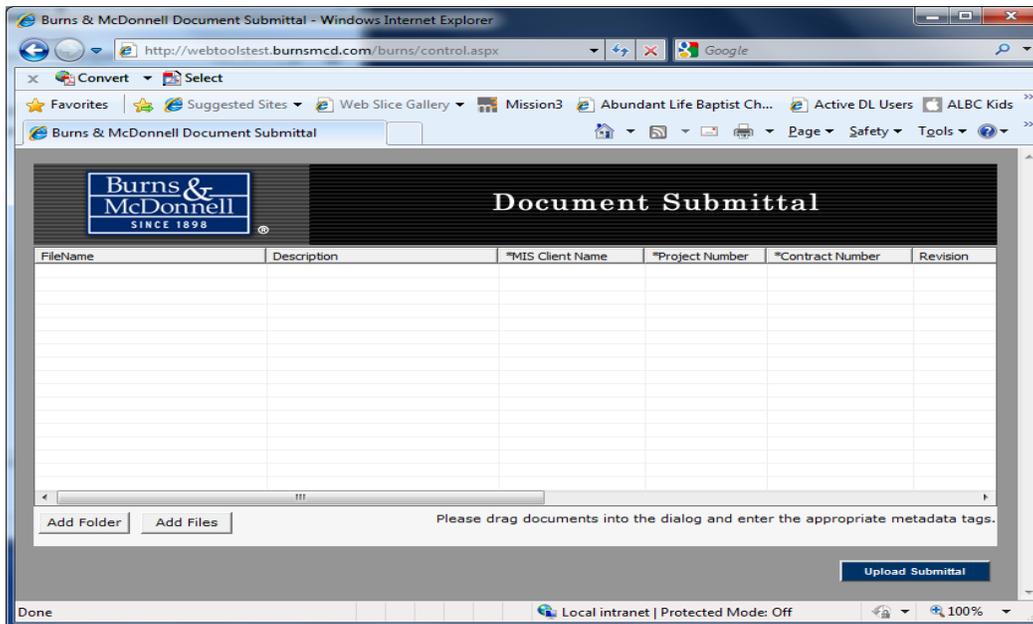
Vendor Submittal Reference Document



- If this is the first time you are visiting the Submittal screen then you will be prompted to load the ActiveX Add-On that will allow you to drag and drop documents into the screen. Click on Install to load the ActiveX Add-On.
Note: Some companies prohibit the install of an ActiveX Add-On. If this is the case for your system administrators please contact your BMCD representative.



- After installing the Active X component, the window is now ready for files to be drag and dropped directly into the grid part of the window.

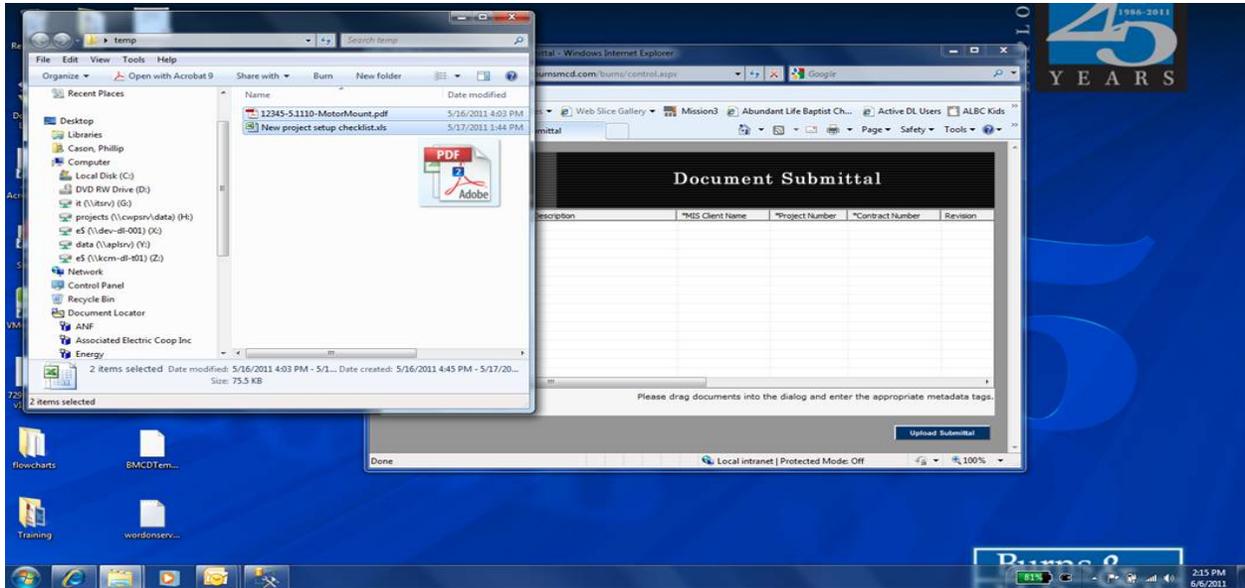


Appendix E

Vendor Submittal Reference Document



2. Select the files from your system and drag them into the window.



One of two options may be used in the Create Submittal window:

- Drag and drop a File
- Use the Add Folder or Add Files buttons in the Document Submittal window.

A vendor transmittal number will be assigned to the Submittal upon receipt. If preferred, a transmittal may be created and added to the list of files as a separate document. Please check with your project team for specific submittal needs.

- The Filename, client name, and project number will be pre-populated in the Create Submittal window. Before dragging the files into the window make sure they follow the file naming requirements.
- **Filename** should be the same as the Drawing Name or Document Number.

Do not include the following in the filenames:

- a. Revision
- b. Dates
- c. Transmittal Information

Note: If the document is being resubmitted then the filename must match EXACTLY with the previous submittal name.

Valid filename examples: A07-9877-8-1.pdf, M-114-1-par.pdf, A-347-wps.pdf, 18555-18 ASME calcs.pdf, Terminal Point List.pdf

Appendix E

Vendor Submittal Reference Document



- **Description** is required and should relate to the **document title** from the title block of the drawing.
Valid description include: General Arrangements, Weld Procedures, Code Calcs, Terminal Point List, Wiring Diagram – Analyzer.
 - **Revision** should be the actual revision from the document title block. If the document does not have a revision enter a dash/hyphen (-).
 - Items with an * in the column name are required. Items that do not include the * may still be required by your project. Please fill in as much detail as possible unless directed otherwise by your BMCD Document Control contact.
- Note: Columns in the window may be resized as needed. If a drop down list is supplied then only those values may be selected. To narrow a list of items or if a value is known, it may be typed or the copy/paste option may be used into the drop down.**

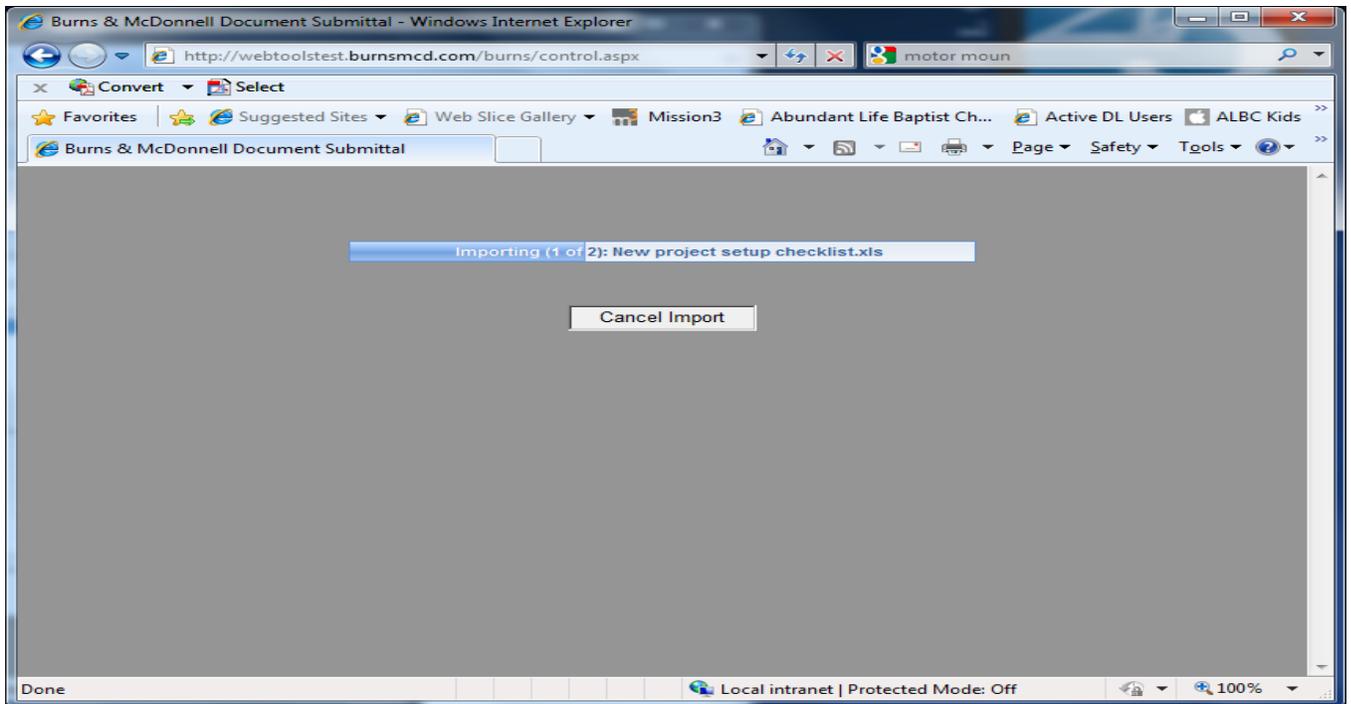
Description	*MIS Client Name	*Project Number	*Contract Number	Revision	*Subm
setup checklist.xls	BurnsMcD Training	12345	5.1110	A	
10-MotorMount.pdf	BurnsMcD Training	12345	5.1110	A	

Appendix E

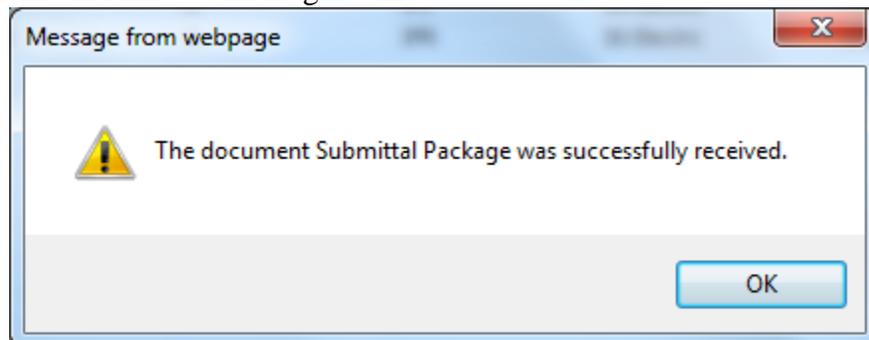
Vendor Submittal Reference Document



3. Click on the Upload Submittal and the files will begin to load.



4. When complete you will be prompted that the Package was successfully received. Click OK and you will be returned to the Login Window.



Notification of Receipt:

Within a few minutes you will receive an email notice that will include a link to a transmittal receipt. If there is a correction made to the submittal you may receive an additional notice that will include a link to the updated transmittal receipt.

Appendix E

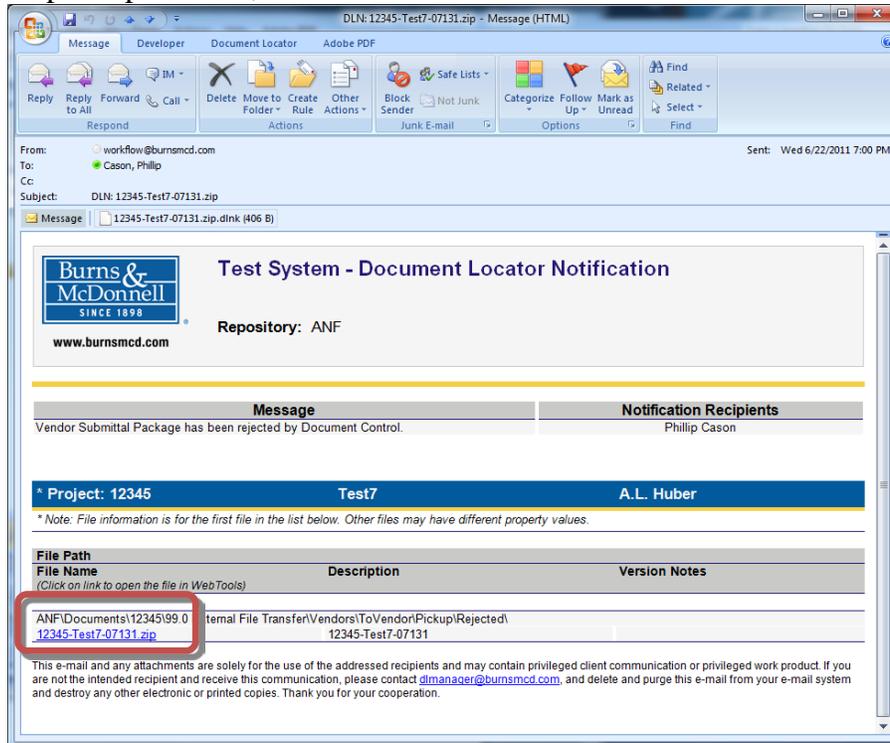
Vendor Submittal Reference Document



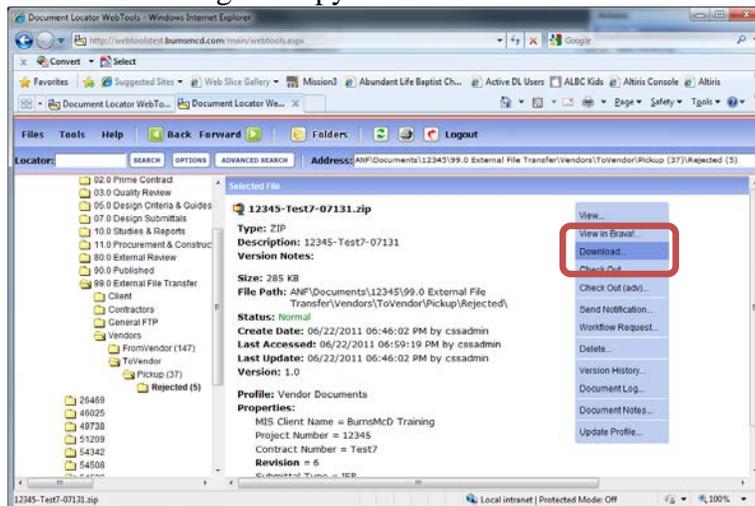
Picking up a Reviewed Submittal

If your Submittal is being return after a review or is rejected, you will receive an email from the system with a link to a zip file consisting of the files.

1. To pick up the files, Click the File link.



2. After logging into WebTools you will be directed to the document for pickup. Click on Download to get a copy of the file.



3. Select a location on your hard drive to save the file and click ok.

SECTION 016001 - EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes general requirements for transportation and handling, delivery, storage, and protection of Supplier-furnished Equipment and Materials.
- B. Related SECTIONS:
 - 1. Submittals: SECTION 013301.

1.02 DEFINITIONS:

- A. Terms used in this SECTION are not intended to negate the meaning of other terms used in the Contract , including such terms as "systems," "structures," "finishes," "accessories," "furnishings," "special construction," and similar terms. Such terms are self-explanatory and have recognized meanings in the construction industry.

1.03 QUALITY ASSURANCE:

- A. Equipment and Material incorporated into the Work:
 - 1. Conform to the Specifications and applicable codes, standards, and requirements of regulatory agencies.
 - 2. Provide Products that comply with the requirements of the Contract, undamaged and, unless otherwise indicated, new and unused at the time of installation. Provide Products that are complete with all accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for the intended use and effect.
 - a. Standard Products: Where they are available and comply with the Specifications, provide standard Products of types that have been produced and used successfully in similar situations on other projects.
 - b. Continued Availability: Where, because of the nature of its application, Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard Products for which the manufacturer has published assurances that the products and its parts are likely to be available to Owner at a later date.
 - 3. Comply with size, make, type, and quality specified, or as specifically approved in writing by Owner.
 - 4. Manufactured and Fabricated Products:
 - a. Design, fabricate, and assemble in accordance with the applicable standard trade, engineering, and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
 - c. Two or more items of the same kind shall be identical, by the same manufacturer.
 - d. Equipment and Material shall be suitable for service conditions intended.
 - e. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing by Owner.

SECTION 016001 - EQUIPMENT AND MATERIALS: Continued

5. Do not use Material or Equipment for any purpose other than that for which it is designed or is specified.
- B. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
 1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated Equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer including address and telephone number.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
- C. Electronic Equipment Compliance:
 1. Supplier warrants that all equipment, devices, items, systems, software, hardware, or firmware provided shall properly, appropriately, and consistently function and accurately process date and time data (including without limitation: calculating, comparing, and sequencing). This warranty supersedes anything in the Contract which might be construed inconsistently. This warranty is applicable whether the equipment, device, item, system, software, hardware, or firmware is specified with or without reference to a manufacturer's name, make, or model number.

1.04 TRANSPORTATION AND HANDLING:

- A. Shipment Preparation:
 1. Supplier shall prepare Equipment and Materials for shipment in a manner to facilitate unloading and handling, and to protect against damage or unnecessary exposure in transit and storage. Provisions for protection shall include the following:
 - a. Crates or other suitable packaging materials.
 - b. Covers and other means to prevent corrosion, moisture damage, mechanical injury, and accumulation of dirt in motors, electrical equipment, and machinery.
 - c. Suitable rust-preventive compound on exposed machined surfaces and unpainted iron and steel.
 - d. Grease packing or oil lubrication in all bearings and similar items.
- B. Marking: Tag or mark each item of Equipment and Material as identified in the delivery schedule or on Submittals and include complete packing lists and bills of material with each shipment. Each piece of every item need not be marked separately provided that all pieces of each item are packed or bundled together, and the packages or bundles are properly tagged or marked.

SECTION 016001 - EQUIPMENT AND MATERIALS: continued

- C. Bills of Material: Supplier shall mail bills of material to Engineer prior to delivery of each shipment and shall include bills of material with each shipment.
- D. Delivery:
 - 1. Furnish Engineer all requirements for unloading and handling of Equipment and Materials upon delivery sufficiently in advance to allow installing contractor sufficient preparation time. Include type and capacity of unloading equipment required as applicable.
 - 2. Deliver Equipment and Materials in an undamaged condition, in original containers or packaging, with identifying labels intact and legible.
 - 3. Mark partial deliveries of component parts to identify the Equipment or Material, to permit easy accumulation of parts, and to facilitate assembly.
- E. Receipt and Unloading:
 - 1. Deliver all Equipment and Materials complete with packing lists and bills of material. Installing contractor will furnish receipts to shipper upon delivery.
 - 2. Installing contractor will receive, check, unload, inventory, accept, and store all Equipment and Materials delivered to the Point of Delivery in accordance with proper notice. Installing contractor will report any damage to prior to or during unloading and notify Owner's site representative of any shortage at time of delivery. Owner's site representative will verify such reports and so notify Supplier.

1.05 STORAGE AND PROTECTION:

- A. Storage Requirements:
 - 1. Furnish Engineer all requirements for storage and protection of all Equipment and Materials with notice of shipment, to allow installing contractor sufficient preparation time.
 - 2. Installing contractor will furnish all facilities needed for storage of Equipment at the Project Site.
 - 3. Installing contractor will assume responsibility for and protect all Equipment in accordance with Supplier's recommendations.

PART 2 - PRODUCTS - Specified in applicable Sections.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 016001

SECTION 017501 - MANUFACTURER'S FIELD SERVICES

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes requirements of manufacturers of Equipment and Materials for Field Services as defined and specified herein to be performed at the Project Site in regards to erection, start-up, and testing of Equipment and Materials.

1.02 SERVICES REQUIRED:

- A. Services with Equipment and Materials furnished under this Contract:
 1. Furnish the services of qualified, competent field representative and necessary assistants for Equipment and Materials furnished under this Contract, as required to perform all manufacturers' Field Services called for in the Specifications. Field representative shall be certified by the manufacturer of the specified product or system as having the necessary knowledge and experience to perform the required functions.
 2. Where such service is specified, installing contractor will not perform any work related to the installation or operation of Equipment or Materials furnished under this Contract without direct observation and guidance of the Supplier's or manufacturer's field personnel unless Owner concurs otherwise.
 3. Supplier shall arrange to have the Supplier's or manufacturer's field personnel perform the following:
 - a. Supervise the initial start-up, operational check, and any required adjustments of Equipment.
 - b. Instruct Owner's designated personnel in proper operation and maintenance of all Equipment and Materials as required by Owner.
 4. Supplier shall arrange for field personnel to report to the Site at times designated by Owner's site representative, advise Owner's site representative of arrival at the Site, and furnish Owner's site representative a written report covering all Work done at least once each week and when completed.
 5. Field representative shall be acceptable to Owner and Owner's site representative and shall not be changed during the installation operations without Owner's consent unless field representative proves unsatisfactory to Owner and Owner's site representative.
 6. Field representative shall represent Supplier at the Site, and all instructions given to him shall be as binding as if given to Supplier.
 7. Direct responsibility for planning, supervising, and executing the installation work of Equipment will remain with installing contractor.
 8. All start-up, adjustments, and testing of Equipment will be performed in the presence of Owner and Supplier's field representative, unless otherwise agreed, and such operations will be in accordance with Supplier's instructions.
 9. It shall be the duty of Supplier's field representative during the progress of start-up and testing, and such other times as may be required by Owner's site representative, to instruct Owner's designated personnel in the proper operation and maintenance of the

SECTION 017501 - MANUFACTURER'S FIELD SERVICES: continued

Equipment. Such instruction shall terminate only when both the Supplier's field representative and Owner are satisfied that the Owner's personnel are properly instructed.

PART 2 - PRODUCTS: Specified in applicable Sections.

PART 3 - EXECUTION

3.01 OPERATION AND TESTING:

- A. Duties of the field representative during erection or installation shall include:
 - 1. Instructing and guiding the installing contractor concerning proper methods and procedures on all technical phases of installation.
 - 2. Inspecting and indicating approval or disapproval of each phase of the Work as it progresses.
 - 3. Reporting his observations in writing to the installing contractor, with copies to Owner, at least once each week unless otherwise agreed.
 - 4. Determining when Equipment is ready for start-up and operational checks.
- B. Placing Equipment in operation:
 - 1. Installing contractor will place all Equipment and Materials furnished by this Contract into successful operation according to instructions of the Supplier or manufacturer, or field representative, including making of all required adjustments, tests, operation checks, and the following as applicable:
 - a. Cleaning, sounding, blowing-out, flushing of lubricating oil and water systems and other pipelines.
 - b. Lubrication supplied by Supplier unless specified to be furnished by Owner or others.
 - c. Tests of lubrication system safety interlocks and system performance.
 - d. Final alignment checks and measurements made under observation of Owner or Owner's site representative. Alignment checks shall include opening connections if required to ensure there are no abnormal stresses on Equipment from pipes, ducts, or other attachments. Alignment shall be within tolerances specified by the manufacturer, and measurements shall be recorded and furnished to Owner's site representative.
 - e. Motor rotation checks before connecting couplings.
 - f. Inspection of sleeve bearings for adequate contact.
 - g. Checking of anchor-bolt tensions, grout, and shims. Anchor bolts shall be tightened with calibrated torque wrenches using care not to over stress bolts.
 - 2. After "run-in" and acceptance of alignment, major Equipment shall be affixed in place using standard tapered dowels with jack-out nuts at head end to facilitate removal.
 - 3. All above operations shall be recorded on forms either furnished by Owner or by Supplier and approved by Owner and Owner's site representative.

SECTION 017501 - MANUFACTURER'S FIELD SERVICES: continued

4. Provide all necessary field representatives and assistants as part of the Work to accomplish the above operations until such time as individual items, systems, Equipment, or sections of the plant are acceptable for operation by Owner.
 5. With advice of Supplier, installing contractor will provide the required utilities for placing Equipment in operation, and Owner's personnel may assist or witness.
- C. Performance Tests:
1. Equipment and Materials Furnished under this Contract:
 - a. Owner may conduct acceptance tests after installation to determine if the Equipment and Materials installed as part of the Work perform in accordance with the Contract and as guaranteed. Final acceptance of Equipment and Materials will be based on acceptable results of such tests.
 - b. No tests will be conducted on Equipment or Materials for which manufacturer's Field Services are specified unless manufacturer's field representative is present and declares in writing that the Equipment and Materials are ready for such test.
 - c. Supplier will be notified by Owner's site representative so that Supplier can have a representative, or manufacturer's representative, present during any tests of Equipment or Materials furnished by this Contract for which manufacturer's Field Services are not specified.
 - d. The tests will be made as set forth in the Contract unless the interested parties mutually agree upon some other manner of testing.

END OF SECTION 017501

SECTION 017801 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY:

- A. Related Work Specified Elsewhere:
 - 1. Prerequisites for final acceptance and payment: Attachment A Commercial Terms & Conditions.
 - 2. Submittals: SECTION 013301.
 - 3. Manufacturer's Field Services: SECTION 017501.
 - 4. Warranties: Attachment A Commercial Terms & Conditions.

1.02 REQUIREMENTS FOR FINAL PAYMENT:

- A. Unless otherwise required elsewhere by this Contract, the following shall be furnished to Owner prior to application for final payment.
 - 1. Field Services.
 - 2. Maintenance and operating instructions.
 - 3. Guarantees.
 - 4. Certifications of inspection.
 - 5. "Record Document" Submittals.
 - 6. Other documents as required by the Contract.
 - 7. Spare parts.

1.03 PROJECT RECORD DOCUMENTS:

- A. General: Maintain at the Supplier's facilities one record copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Approved Shop Drawings, Product Data, and Samples.
- B. Recording:
 - 1. Label each document "PROJECT RECORD" in neat, large, printed letters.
 - 2. Record information concurrently with fabrication or Field Services progress.
 - 3. Record Drawings: Legibly mark to record actual construction:
 - a. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
 - b. Field changes of dimension and detail.
 - c. Changes made by Change Order or other modifications to the Contract. Note related Change Order numbers where applicable.
 - d. Details not on original drawings included in the Contract.
 - 4. Record Specifications and Addenda: Legibly mark each Section to record:
 - a. Manufacturer, trade name, catalog number, and supplier of each product and item of Equipment actually furnished, particularly optional and substitute items.
 - b. Changes to the Contract made by addendum, Change Order, or other modifications.
 - c. Related Submittals.

SECTION 017801 - CONTRACT CLOSEOUT: Continued

5. Record Product Data: Maintain one copy of each product data Submittal, and mark-up significant variations in actual Work in comparison with submitted information.
 - a. Include both variations in product as delivered to Point of Delivery, and variations from manufacturer's instructions and recommendations for installation.
 - b. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily observed. Note related Change Orders and mark-up of record drawings and specifications.
 6. Miscellaneous Record Submittals: Refer to other SECTIONS of these Specifications for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work.
 7. Instruction Books and Operating Manuals: Specified in SECTION 013301.
 8. Electronic Documentation:
 - a. Provide electronic versions of record documents showing "as-constructed" conditions, master field drawing list showing final revisions, instruction books, and operating manuals on CD-ROM or flash drive in searchable Adobe PDF and AutoCAD 2012 or later.
- C. Delivery:
1. Deliver Record Documents to Owner.
 2. Accompany submittal with transmittal letter in duplicate, containing:
 - a. Date.
 - b. Contract title and number.
 - c. Supplier's name, address, and telephone number.
 - d. Number and title of each Record Document.
 - e. Signature of Supplier's authorized representative.

1.04 WARRANTIES AND BONDS:

- A. Specified in Attachment A Commercial Terms & Conditions.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 017801

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract and DIVISION 01 Specification Sections, apply to this Section.

1.02 SUMMARY:

- A. Section includes 3 Generator-Side Make-Up Air Units, each factory-packaged and capable of supplying 100% outdoor air.
- B. Refer to Equipment Schedule on drawings if applicable.

1.03 REFERENCES:

- A. Applicable Standards (Latest Edition):
 1. Air Movement and Control Association International, Inc. (AMCA):
 - a. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating (ANSI).
 2. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):
 - a. ASCE/SEI 7 - Minimum Design Loads for Buildings and Other Structures.
 3. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - a. ASHRAE 52.1 - Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter (ANSI).
 - b. ASHRAE 52.2 - Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size (ANSI).
 - c. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality (ANSI).
 4. ASTM International (ASTM):
 - a. ASTM C534 - Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 - b. ASTM C916 - Specification for Adhesives for Duct Thermal Insulation.
 - c. ASTM C1071 - Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
 5. Code of Federal Regulations (CRF):
 - a. 40 CFR, Part 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
 6. International Electrotechnical Commission (IEC):
 - a. IEC 60947-4-1 (Amendment 2) - Part 4: Contactors and Motor Starters: Section 1, "Electromechanical Contactors and Motor Starters."
 7. National Electrical Manufacturers Association (NEMA):
 - a. NEMA 250 - Enclosures for Electrical Equipment (1,000V Maximum).
 - b. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V Maximum).
 8. NFPA:
 - a. NFPA 70 - National Electrical Code.
 - b. NFPA 90A - Installation of Air-Conditioning and Ventilating Systems.
 9. Underwriters Laboratories, Inc. (UL):
 - a. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

1.04 ACTION SUBMITTALS:

- A. Product Data: For each type of product. Include rated capacities, operating characteristics, fan curves, sound power data, filter data (if applicable), and furnished specialties and accessories.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.
 - 4. Provide equipment sequence of operation and recommended spare part list.

1.05 CLOSEOUT SUBMITTALS:

- A. Operation and Maintenance Data: Include emergency, operation, and maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS:

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and equipment tag number.
 - 1. Fan Belts: One set for each type of belt-driven fan.
 - 2. Filters: One set of each type per unit.

1.07 QUALITY ASSURANCE:

- A. Perform all manufacturer's standard tests for the equipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. AbsolutAire, Inc.
- B. Aerovent
- C. Cambridge Engineering.
- D. Hartzell Manufacturing.
- E. Rapid Engineering, LLC.

2.02 PERFORMANCE REQUIREMENTS:

- A. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Generator-Side Ventilators, MAU-P-1B through MAU-P-3B:
 - 1. Capacities and Characteristics: SEE SCHEDULE.

2.03 CABINET:

- A. Construction: Single wall.
- B. Exterior Casing Material: 16-gauge aluminized steel with painted exterior.
 - 1. Color to be chosen by Owner.
- C. Lifting and Handling Provisions: Factory-installed removable lifting lugs.
- D. Base Perimeter: 3 x 3 x ¼" welded structural steel.
- E. Support: Galvanized steel formed legs for mounting on pad (shipped loose for nut & bolt field installation).
- F. Access for Inspection, Cleaning, and Maintenance:
 - 1. Service Doors: Hinged access doors with gaskets. Material and construction of doors shall match material and construction of cabinet in which doors are installed.

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

- G. Roof: Fully sealed and weather-proofed, sloped to drain water.
- H. Floor: Not intended for walking on by service personnel.
- I. Cabinet Insulation: Not required.

2.04 SUPPLY FAN:

- A. Plenum Fan Type: Single-width single-inlet (SWSI) backward-inclined airfoil plenum type.
 - 1. Fan Wheel Material: Painted steel.
 - 2. Fan Wheel Drive and Arrangement: Class 2, AMCA Arrangement 3.
 - 3. Fan inlet cone: Precision formed painted steel or aluminum.
 - 4. Fan Bearings: Spherical roller pillow block or flange block type with minimum L-10 100,000 hour bearing life. Fan bearing lubrication lines extended to cabinet exterior. Factory filled, purged, attached and labeled with lubrication schedule.
 - 5. Fan Balance: Factory precision balance fan at or below 0.08 inch/s (2.0 mm/s) at design speed with filters installed.
- B. Service Factor for Belt Drive Applications: V-belt drive with matching fan pulley and adjustable motor sheaves and belt assembly with minimum 1.4 service factor.

2.05 FILTERS:

- A. Extended-Surface, Disposable Panel Filters:
 - 1. Comply with NFPA 90A.
 - 2. Factory-fabricated, dry, extended-surface type.
 - 3. Thickness: 2 inches (50 mm).
 - 4. Minimum Arrestance: 90, according to ASHRAE 52.1.
 - 5. Minimum MERV: 8, according to ASHRAE 52.2.
 - 6. Media: Fibrous material formed into deep-V-shaped pleats and held by self-supporting wire grid.
- B. Mounting Frames:
 - 1. Extended surface filters v-bank arranged, removable from hinged access door.

2.06 ELECTRICAL POWER CONNECTIONS:

- A. General Electrical Power Connection Requirements: Factory-installed and wired switches, motor controllers, transformers, and other necessary electrical devices shall provide a single-point field power connection to unit.
- B. Unit Electrical Enclosure: NEMA 250, Type 4, mounted at unit with hinged access door. To include all electrical components, such as fused disconnect switch, 120-volt and 24-volt transformers, control circuit fuse, and a full number coded terminal strip. The control enclosure shall be lighted with a minimum 15 watt LED or CFL bulb, able to operate with the main disconnect switch in the off or on position.
- C. VFD cabinet shall be furnished separate from the fan assembly for mounting in a remote location.
- D. Factory-Mounted, overcurrent protection for each motor.
- E. Controls: Factory wire unit-mounted controls where indicated.
- F. Control Relays: Auxiliary and adjustable time-delay relays.

2.07 MOTORS:

- A. Acceptable Manufacturers:
 - 1. Baldor
 - 2. TECO
 - 3. WEG

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

- B. Insulation: Class F
- C. Service Factor: 1.15
- D. Provide with Aegis motor shaft grounding ring.

2.08 CONTROLS:

- A. Control Wiring: Factory wire connection for controls power supply.
- B. Control Devices: Sensors, transmitters, relays, switches, detectors, operators, actuators, and valves shall be manufacturer's standard items to accomplish indicated control functions.
- C. Remote Mounted Status Panel:
 - 1. Hand/Off/Auto Controls: Control operational mode.
 - 2. Status Lights:
 - a. Filter dirty.
 - b. Fan operating.
 - 3. Wiring to the VFD, Relief Damper, Fire Alarm Panel, and plant control system from the unit control panel is field provided by Others.
- D. Control Dampers:
 - 1. Damper Location: Factory installed inside unit for ease of blade axle and bushing service.
 - 2. Damper Type: Parallel blade, low leak with blade & edge seals.
 - 3. Damper Rating: Rated for close-off pressure equal to the fan shutoff pressure.
 - 4. Blade Configuration: Unless otherwise indicated, use parallel blade configuration for two-position control and equipment isolation service.
 - 5. Damper Frame Material: Galvanized steel.
 - 6. Blade Material & Type: Formed 16 gauge galvanized steel.
 - 7. Maximum Blade Width: 6 inches (150 mm).
 - 8. Maximum Blade Length: 48 inches (1200 mm).
 - 9. Blade Seals: Replaceable, continuous perimeter vinyl seals and jambs with stainless-steel compression-type seals.
- E. Damper Operators:
 - 1. Factory-installed electric operator for each damper assembly, direct shaft mounted.
 - 2. Operator capable of shutoff against fan pressure and able to operate the damper with sufficient reserve power to achieve smooth modulating action and proper speed of response at the velocity and pressure conditions to which the damper is subjected.
 - 3. Maximum Operating Time: Open or close damper 90 degrees in 30 seconds.
 - 4. Adjustable Stops: For both maximum and minimum positions.
 - 5. Position Indicator and Graduated Scale: Factory installed on each actuator with words "OPEN" and "CLOSED," or similar identification, at travel limits.
 - 6. Spring-return operator to fail-safe closed.
 - 7. Operator Type: Direct coupled, designed for minimum 60,000 full-stroke cycles at rated torque.
 - 8. Position feedback Signal: For remote monitoring of damper position.
 - 9. Coupling: V-bolt and V-shaped, toothed cradle.
 - 10. Circuitry: Electronic overload or digital rotation-sensing circuitry.
- F. Fan Control: Provide N-switch to ensure unit isolation dampers are fully open before starting fan. N-switch shall also ensure that fan does not run unless dampers are fully open.
- G. Fan Speed Control: Standalone control module for link between unit controls temperature signal. VFD speed shall automatically adjust to control to temperature setpoint. Temperature sensors will be wired by others.
 - 1. Hardware interface or additional sensors for the following:
 - a. Room temperature.

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

- b. Constant and variable motor loads.
- c. Variable-frequency-controller operation.
- d. As required to implement the sequence of operation.

PART 3 - EXECUTION

3.01 STARTUP SERVICE:

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify operation of remote panel including failure modes. Inspect the following:
 - a. Alarms.
 - 3. Verify that clearances have been provided for servicing.
 - 4. Verify that controls are connected and operable.
 - 5. Verify that filters are installed.
 - 6. Adjust fan belts to proper alignment and tension.
 - 7. Start unit.
- B. After startup, verify bearing lubrication, and adjust belt tension.
- C. Remove and replace components that do not properly operate and repeat startup procedures as specified above.
- D. Prepare written report of the results of startup services.

3.02 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 237433

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract and DIVISION 01 Specification Sections, apply to this Section.

1.02 SUMMARY:

- A. Section includes 3 Auxiliary-Side Make-Up Air Units, each factory-packaged and capable of supplying 100% outdoor air.
- B. Refer to Equipment Schedule on drawings if applicable.

1.03 REFERENCES:

- A. Applicable Standards (Latest Edition):
 - 1. Air Movement and Control Association International, Inc. (AMCA):
 - a. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating (ANSI).
 - 2. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):
 - a. ASCE/SEI 7 - Minimum Design Loads for Buildings and Other Structures.
 - 3. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - a. ASHRAE 52.1 - Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter (ANSI).
 - b. ASHRAE 52.2 - Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size (ANSI).
 - c. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality (ANSI).
 - 4. ASTM International (ASTM):
 - a. ASTM C534 - Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 - b. ASTM C916 - Specification for Adhesives for Duct Thermal Insulation.
 - c. ASTM C1071 - Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
 - 5. Code of Federal Regulations (CRF):
 - a. 40 CFR, Part 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 6. International Electrotechnical Commission (IEC):
 - a. IEC 60947-4-1 (Amendment 2) - Part 4: Contactors and Motor Starters: Section 1, "Electromechanical Contactors and Motor Starters."
 - 7. National Electrical Manufacturers Association (NEMA):
 - a. NEMA 250 - Enclosures for Electrical Equipment (1,000V Maximum).
 - b. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V Maximum).
 - 8. NFPA:
 - a. NFPA 70 - National Electrical Code.
 - b. NFPA 90A - Installation of Air-Conditioning and Ventilating Systems.
 - 9. Underwriters Laboratories, Inc. (UL):
 - a. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

1.04 SUBMITTALS:

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- A. Product Data: For each type of product. Include rated capacities, operating characteristics, fan curves, sound power data, filter data (if applicable), and furnished specialties and accessories.
 - B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.
 - 4. Provide equipment sequence of operation and recommended spare part list.
- 1.05 CLOSEOUT SUBMITTALS:
- A. Operation and Maintenance Data: Include emergency, operation, and maintenance manuals.
- 1.06 MAINTENANCE MATERIAL SUBMITTALS:
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and equipment tag number.
 - 1. Fan Belts: One set for each type of belt-driven fan.
 - 2. Filters: One set of each type per unit.
- 1.07 QUALITY ASSURANCE
- A. Perform all manufacturer's standard tests for the equipment.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS:
- A. AbsolutAire, Inc.
 - B. Aerovent
 - C. Cambridge Engineering.
 - D. Hartzell Manufacturing.
 - E. Rapid Engineering, LLC.
- 2.02 PERFORMANCE REQUIREMENTS:
- A. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - B. Auxiliary-Side Ventilators, MAU-P-1A through MAU-P-3A:
 - 1. Capacities and Characteristics: SEE SCHEDULE.
- 2.03 CABINET:
- A. Construction: Single wall.
 - B. Exterior Casing Material: 18-gauge aluminized steel with painted exterior.
 - 1. Color to be chosen by Owner from manufacturer's standard colors.
 - C. Lifting and Handling Provisions: Factory-installed removable lifting lugs.
 - D. Base Perimeter: 2 x 2 x ¼" welded structural steel.
 - E. Access for Inspection, Cleaning, and Maintenance:
 - 1. Service Doors: Hinged access doors with gaskets and door hold open devices. Material and construction of doors shall match material and construction of cabinet.
 - F. Roof: Fully sealed and weather-proofed. Internally supported to support weight of filter unit mounted on top.
 - G. Floor: Not intended for walking on by service personnel.

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- H. Cabinet Insulation: Not required.
 - I. Cabinet configuration:
 - 1. Join two fan housings horizontally to form a single unit.
 - 2. Joined units are to have a single electrical panel.
- 2.04 SUPPLY FAN:
- A. Fan Type: double-width double-inlet (DWDI) forward curved or single-width single-inlet (SWSI) backward-inclined airfoil plenum type
 - 1. Fan Wheel Material: Steel, mounted on solid-steel shaft.
 - 2. Bearings: Pillow-block bearings rated L₁₀ life of 100,000 hours and shall include extended grease lines to the cabinet exterior, labeled with greasing intervals.
 - B. Service Factor for Belt Drive Applications: V-belt drive with matching fan pulley and adjustable motor sheaves and belt assembly with minimum 1.4 service factor.
- 2.05 OUTDOOR-AIR INTAKE HOOD:
- A. Type: Manufacturer's standard hood or louver.
 - B. Materials: Match base cabinet.
 - C. Configuration: Designed to inhibit wind-driven rain and snow from entering unit.
- 2.06 FILTERS:
- A. Extended-Surface, Disposable Panel Filters:
 - 1. Comply with NFPA 90A.
 - 2. Factory-fabricated, dry, extended-surface type.
 - 3. Thickness: 2 inches (50 mm).
 - 4. Minimum Arrestance: 90, according to ASHRAE 52.1.
 - 5. Minimum MERV: 8, according to ASHRAE 52.2.
 - 6. Media: Fibrous material formed into deep-V-shaped pleats and held by self-supporting wire grid.
 - B. Mounting Frames:
 - 1. Removable from hinged access door.
- 2.07 ELECTRICAL POWER CONNECTIONS:
- A. General Electrical Power Connection Requirements: Factory-installed and wired switches, motor controllers, transformers, and other necessary electrical devices shall provide a single-point field power connection to unit.
 - B. Unit Electrical Enclosure: NEMA 250, Type 4, mounted at unit with hinged access door. To include all electrical components, such as fused disconnect switch, 120-volt and 24-volt transformers, control circuit fuse, and a full number coded terminal strip. The control enclosure shall be lighted with a minimum 15 watt LED or CFL bulb, able to operate with the main disconnect switch in the off or on position.
 - C. Factory-Mounted, overcurrent protection for each motor.
 - D. Controls: Remote-mounted control panel field-wired by Others.
 - E. Control Relays: Auxiliary and adjustable time-delay relays.
- 2.08 MOTORS:
- A. Acceptable Manufacturers:
 - 1. Baldor
 - 2. TECO
 - 3. WEG

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- B. Insulation: Class F
- C. Service Factor: 1.15
- D. Non-overloading across entire fan curve.

2.09 CONTROLS:

- A. Control Wiring: Factory wire connection for controls power supply.
- B. Control Devices: Sensors, transmitters, relays, switches, detectors, operators, actuators, and valves shall be manufacturer's standard items to accomplish indicated control functions.
- C. Unit-Mounted Status Panel:
 - 1. Hand/Off/Auto Controls: Control operational mode.
 - 2. Status Lights:
 - a. Filter dirty.
 - b. Fan operating.
 - 3. Wiring to the Starter, Relief Damper, Fire Alarm Panel, and plant control system from the unit control panel is field provided by Others.
- D. Control Dampers:
 - 1. Damper Location: Factory installed inside unit for ease of blade axle and bushing service.
 - 2. Damper Type: Parallel blade, low leak with blade & edge seals.
 - 3. Damper Rating: Rated for close-off pressure equal to the fan shutoff pressure.
 - 4. Blade Configuration: Unless otherwise indicated, use parallel blade configuration for two-position control and equipment isolation service.
 - 5. Damper Frame Material: Galvanized steel.
 - 6. Blade Material & Type: Formed 16 gauge galvanized steel.
 - 7. Maximum Blade Width: 6 inches (150 mm).
 - 8. Maximum Blade Length: 48 inches (1200 mm).
 - 9. Blade Seals: Replaceable, continuous perimeter vinyl seals and jambs with stainless-steel compression-type seals.
- E. Damper Operators:
 - 1. Factory-installed electric operator for each damper assembly, direct shaft mounted.
 - 2. Operator capable of shutoff against fan pressure and able to operate the damper with sufficient reserve power to achieve smooth modulating action and proper speed of response at the velocity and pressure conditions to which the damper is subjected.
 - 3. Maximum Operating Time: Open or close damper 90 degrees in 30 seconds.
 - 4. Adjustable Stops: For both maximum and minimum positions.
 - 5. Position Indicator and Graduated Scale: Factory installed on each actuator with words "OPEN" and "CLOSED," or similar identification, at travel limits.
 - 6. Spring-return operator to fail-safe closed.
 - 7. Operator Type: Direct coupled, designed for minimum 60,000 full-stroke cycles at rated torque.
 - 8. Position feedback Signal: For remote monitoring of damper position.
 - 9. Coupling: V-bolt and V-shaped, toothed cradle.
 - 10. Circuitry: Electronic overload or digital rotation-sensing circuitry.
- F. Fan Control: Provide N-switch to ensure unit isolation dampers are fully open before starting fan. N-switch shall also ensure that fan does not run unless dampers are fully open.
- G. Fan Speed Control: Standalone control module for link between unit controls temperature signal. Fans shall run based on adjustable temperature setpoint with adjustable deadband. Temperature sensors will be wired by others. Fans shall operate in a lead-lag configuration.
 - 1. Hardware interface or additional sensors for the following:
 - a. Room temperature.

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- b. Monitoring:
 - (1) On-off status
 - (2) Common trouble alarm
 - (3) As required to implement the sequence of operation.

PART 3 - EXECUTION

3.01 STARTUP SERVICE:

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify operation of remote panel including failure modes. Inspect the following:
 - a. Alarms.
 - 3. Verify that clearances have been provided for servicing.
 - 4. Verify that controls are connected and operable.
 - 5. Verify that filters are installed.
 - 6. Adjust fan belts to proper alignment and tension.
 - 7. Start unit.
- B. After startup, verify bearing lubrication, and adjust belt tension.
- C. Remove and replace components that do not properly operate and repeat startup procedures as specified above.
- D. Prepare written report of the results of startup services.

3.02 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 237433

SECTION 239433 - DATA TO BE SUBMITTED WITH BID – OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.01 PERFORMANCE GUARANTEES:

- A. Each Generator-Side Make-Up Air Unit shall be guaranteed for the following:
 - 1. Discharge capacity at design conditions, cfm _____
 - 2. Discharge pressure at design conditions, in wg _____
 - 3. Brake horsepower required at design point _____
- B. Each Auxiliary-Side Make-Up Air Unit shall be guaranteed for the following:
 - 1. Discharge capacity at design conditions, cfm _____
 - 2. Discharge pressure at design conditiond, in wg _____
 - 3. Brake horsepower required at design point _____

1.02 DESCRIPTION OF EQUIPMENT:

- A. Generator-Side Make-Up Air Units:
 - 1. Fan:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Wheel Size _____
 - d. Type _____
 - 2. Air Filter:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. MERV Rating _____
 - d. Clean Pressure Drop, in wg _____
 - e. Recommended Dirty Filter Allowance, in wg _____
 - 3. Housing
 - a. Length, in. _____
 - b. Width, in. _____
 - c. Height, in. _____
 - 4. Motors
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Frame Size _____
 - d. Nameplate Rating, bhp _____
 - e. Service Factor _____
 - f. Rated Speed, rpm _____
 - g. Rated Voltage _____
 - h. Full Load Current, Amperes _____
 - i. Locked Rotor Current, Amperes _____
 - j. Design Efficiency, percent: _____
 - 5. Variable Frequency Drives:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Frame Size _____
 - d. Nameplate Rating, bhp _____
 - e. Service Factor _____
 - f. Maximum Speed, rpm _____
 - g. Rated Voltage _____
 - h. Full Load Current, Amperes _____

SECTION 239433 - DATA TO BE SUBMITTED WITH BID – OUTDOOR-AIR UNITS: continued

- i. Locked Rotor Current, Amperes _____
- j. Design Efficiency, percent _____
- k. Power Factor _____
- l. Number of Poles _____
- B. Auxiliary-Side Make-Up Air Units:
 - 1. Fans:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Wheel Size _____
 - d. Type _____
 - 2. Air Filter:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. MERV Rating _____
 - d. Clean Pressure Drop, in wg _____
 - e. Recommended Dirty Filter Allowance, in wg _____
 - 3. Housing
 - a. Length, in. _____
 - b. Width, in. _____
 - c. Height, in. _____
 - 4. Motors
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Frame Size _____
 - d. Nameplate Rating, bhp _____
 - e. Service Factor _____
 - f. Rated Speed, rpm _____
 - g. Rated Voltage _____
 - h. Full Load Current, Amperes _____
 - i. Locked Rotor Current, Amperes _____
 - j. Design Efficiency, percent: _____

1.03 SUPPLEMENTAL INFORMATION:

- A. Submit the following information on separate sheets with Bid:
 - 1. Fan performance curves showing capacity and horsepower.
 - 2. Dimensioned outline drawings of each item of Equipment proposed.
 - 3. A functional description or schematic diagram of the control system.
 - 4. Weights of all pieces of Equipment.
 - 5. A list of major separate items which will be shipped to power plant Site.
 - 6. Description of proposed test procedure for each major item of Equipment.
 - 7. A list of recommended spare parts including a price for each part.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 239433

DIVISION 26 - ELECTRICAL

SECTION 260002 - ELECTRICAL EQUIPMENT - GENERAL TECHNICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. The electrical Equipment supplied under this Contract will be used in conjunction with Owner's new natural gas fired reciprocating engine plant.
- B. Furnish new Equipment with all auxiliary items except those specified as furnished by Owner, required for complete Equipment systems as specified. This shall include all materials required for complete field assembly, installation, and operation.
- C. Furnish to coordinate completely in physical arrangement, and physical and electrical connections to Equipment and structures furnished by Owner.
- D. Related Work Specified Elsewhere:
 - 1. Heating, Ventilating, and Air Conditioning: DIVISION 23.

1.02 REFERENCES:

- A. Applicable Codes and Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. A6 - General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bar for Structural uses.
 - b. A36 - Structural Steel.
 - c. A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged-Steel Shapes, Plates, Bars, and Strip.
 - d. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - e. A283 - Low and Intermediate Tensile-Strength Carbon-Steel Plates, Shapes and Bars.
 - f. A325 - High-Strength Bolts for Structural Steel Joints.
 - g. B187 - Copper Bus Bar, Rod and Shapes.
 - h. B236 - Aluminum Bars for Electrical Purposes (Bus Bars).
 - i. B317 - Extruded Aluminum-Alloy Bars, Rods, Pipe, and Structural Shapes for Electrical Purposes.

1.03 DELIVERY :

- A. Ship Equipment as completely assembled as possible, within construction limitations at Owner's Site. Factory-install all component Equipment specified. Ship Equipment assemblies with all components completely installed, other than normal draw-out type components such as removable breaker elements.
- B. Tag and package all maintenance equipment, spare parts, and special tools separately. Identify on bill of lading as "Owner's Spare Parts."

1.04 EQUIPMENT QUALIFICATION:

- A. All Equipment and Material designs furnished shall be identical to equipment and material designs having an acceptable history of domestic service for a period of not less than three years at comparable temperature, voltage, and design stress levels.
- B. Equipment and Material designs with less than three years of actual service will be considered from established manufacturers, but shall be furnished only if accepted by Engineer and Owner prior to award of Contract.

SECTION 260002 - ELECTRICAL EQUIPMENT - GENERAL TECHNICAL REQUIREMENTS:
continued

- C. All major Equipment furnished shall be manufactured at Supplier's own plants, unless otherwise approved by Engineer. Minor auxiliary items not manufactured by Supplier shall be supplied by manufacturers approved by Engineer.

1.05 JOB CONDITIONS:

- A. See conditions as stated in SECTION 011100.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS:

- A. Furnish Materials suitable for their application, and for the mechanical and electrical stresses to which they will be subjected.
- B. Furnish all current-carrying parts of high-conductivity copper unless specified otherwise.
- C. Silverplate or tinplate all primary current connections and joints. Plating shall be done after all drilling and cutting operations are completed.
- D. Provide space, cutouts, drilling, and blank plates for future equipment and for equipment installed by others where specifically indicated.
- E. Engraved laminated plastic nameplates shall be as follows:
 - 1. Fabricated from laminated matte finish white plastic with black core. Size of nameplates:
 - a. 1-1/2 inches high and 6 inches long for "Master" nameplates, with 3/8-inch letters.
 - b. 1 inch high and 2 to 3 inches nominal length for individual device nameplates with 3/16-inch letters.
 - 2. Engrave designations as required later by the Engineer.
 - 3. Attach nameplates by permanent adhesive or screws. Double-sided tape is not acceptable.
- F. Wiring:
 - 1. Furnish all wiring integral to all Equipment, including wiring across shipping splits and, where specifically indicated, wiring for future equipment and for equipment installed by others. Factory install all wiring integral to each shipping group, one end of all wiring across shipping splits, and one end of all wiring for future equipment and for equipment installed by others.
 - 2. Make all internal wiring connections at Equipment terminals or terminal blocks; splices in wiring will not be acceptable.
 - 3. Terminate all points requiring external wiring connections, all points requiring field connection to wiring leads from other shipping sections, and all spare contacts on control switches, auxiliary switches, and lockout relays at numbered points on terminal blocks located in the Equipment control compartments.
 - 4. Connect all wiring as indicated on approved Contractor's schematic and connection drawings.
 - 5. Group terminal blocks for external connection to conveniently receive the Owner's cables. Locate terminal blocks for connections across shipping splits adjacent to the split. Terminal blocks for external connection on draw-out breakers shall be fully accessible with the removable breaker element in either the "connected" or "test" position.
 - 6. No more than two wires shall be terminated at any one terminal block stud or screw.
 - 7. Use stranded, tinned copper switchboard wire, insulated for 600VAC, 90°C copper temperature, Type SIS, as follows for internal wiring:

SECTION 260002 - ELECTRICAL EQUIPMENT - GENERAL TECHNICAL REQUIREMENTS:
continued

<u>Type of Circuit</u>	<u>Minimum Wire Size</u>
Indicating light or annunciator	12 AWG
Transducer outputs	12 AWG (shielded)
Power supply branch circuit	12 AWG

8. Install internal wiring in horizontal and vertical wiring troughs or neatly dressed wire bundles for easy accessibility to interior wiring.
 9. Label all wires at equipment studs and terminal blocks with slip-on wire sleeves stamped to indicate wire number or destination terminal number as indicated on approved connection drawings.
 10. Connect all internal grounds to the Equipment internal ground bus.
 11. Terminate all internal wiring individually with pre-insulated ring-tongue-type compression terminals on stud or screw-type terminals.
- G. Terminal Blocks:
1. All terminal blocks shall be heavy duty, rated not less than 30 amperes, 600 volts.
 2. Identify each terminal on each block with a permanent designation.
 3. Mount terminal blocks vertically in rows with provisions for supporting external control cables entering from the top or bottom.

2.02 ELECTRONIC EQUIPMENT COMPLIANCE:

- A. Supplier warrants that all equipment, devices, items, systems, software, hardware, or firmware provided shall properly, appropriately, and consistently function and accurately process date and time data (including without limitation: calculating, comparing, and sequencing). This warranty supersedes anything in the Specifications or other Contract Documents which might be construed inconsistently. This warranty is applicable whether the equipment, device, item, system, software, hardware, or firmware is specified with or without reference to a manufacturer's name, make, or model number.

PART 3 - EXECUTION

- A. Owner and Engineer shall be allowed to visit the plant at any point throughout the manufacturing of the Equipment to verify schedule progress without a Contract Price increase after award of the Contract.

END OF SECTION 260002

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes alternating current electric motors required to drive the equipment furnished under this Contract.
- B. Except as otherwise specified in the driven equipment Divisions, all alternating current motors other than valve and gate motor operators (and special application motors shall be as specified in this SECTION.
- C. Related Work Specified Elsewhere:
 - 1. Dedicated Outdoor-Air Units: SECTION 237433.
 - 2. Duplex Dedicated Outdoor-Air Units: SECTION 237434.

1.02 REFERENCES:

- A. Design, fabricate, assemble, and test equipment and materials to conform to the following codes and standards:
- B. American Bearing Manufacturers Association (ABMA):
 - 1. 9 – Load Ratings and Fatigue Life for Ball Bearings.
 - 2. 11 – Load Ratings and Fatigue Life for Roller Bearings.
- C. Institute of Electrical and Electronics Engineers (IEEE):
 - 1. C50.41 Polyphase Induction Motors for Power Generating Stations.
 - 2. 43 - Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
 - 3. 112 - Standard Test Procedure for Polyphase Induction Motors and Generators.
 - 4. 429 - Recommended Practice for Thermal Evaluation of Sealed Insulation Systems for AC Electric Machinery Employing Form-Wound, Pre-Insulated Stator Coils for Machines 6900V and below.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. MG 1 - Motors and Generators.
 - 2. MG 2 - Safety Standard for Construction, and Guide for Selection, Installation, and Use of Electric Motors and Generators.
- E. Underwriters Laboratories, Inc. (UL):
 - 1. 1004 - Standard for Electric Motors.

1.03 SUBMITTALS:

- A. Submit as specified in SECTION 013300.
 - 1. Submittals required include, but are not limited to, the following items:
 - 2. Outline drawing for each group of identical motors.
 - 3. Nameplate data for each group of identical motors rated 460 volts and below, including the following data:
 - 4. Manufacturer's name and serial number.
 - 5. Manufacturer's type and frame designation.
 - 6. Horsepower output.
 - 7. Time rating.
 - 8. Maximum ambient temperature for which motor is designed.
 - 9. Insulation system designation.
 - 10. Temperature rise and method of measurement.
 - 11. RPM at rated load.
 - 12. Frequency.
 - 13. Number of phases.

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS: continued

14. Rated-load amperes.
 15. Voltage.
 16. Code letter for locked-rotor kVA.
 17. Design letter for polyphase integral-horsepower motors.
 18. Nominal efficiency for motors rated 1 through 199 horsepower.
 19. Service factor.
 20. For motors equipped with thermal protectors, the words "thermally protected."
 21. For motors to be installed for inverter service, the words "inverter duty."
- B. Additional data for each group of identical motors rated above 100 horsepower:
1. Acceleration time with connected load.
 2. Allowable locked rotor time.
 3. Starting capabilities.
 4. Thermal limit curve, superimposed on time-current curves during acceleration of the driven equipment at rated voltage and at minimum specified starting voltage.
 5. Torque and speed curves.
 6. Perform the following factory tests on each motor rated 460 volts and below in conformance with NEMA MG 1 and IEEE 112:
 - a. No-load current and speed at normal voltage and frequency.
 - b. High potential test.
 - c. Other standard factory tests.
 7. For each 460-volt motor rated 200 horsepower and larger, certificate of completion of factory tests.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Motors rated 460 volts and below shall be as manufactured by one or more of the following:
1. General Electric Company.
 2. WEG Electric.
 3. Siemens.
 4. U.S. Electrical Motors.
 5. ABB Baldor.
 6. TECO-Westinghouse.
 7. Engineer-approved equal.

2.02 GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS:

- A. Motors shall be continuous-duty (unless otherwise specified) powerhouse type suitable for a powerhouse environment where moderately abrasive conductive dusts and high humidity are present.
- B. Motors shall be self-ventilated.
- C. Motors shall be designed for full voltage starting.
- D. Motors shall be suitable for operation at an altitude specified in SECTION 011100.
- E. Indoor motors shall be suitable for continuous operation at an ambient temperature specified in SECTION 011100 unless otherwise specified.
- F. All motors shall have squirrel-cage rotors.
- G. The nameplate horsepower rating of each motor at 1.0 service factor shall equal or exceed the horsepower required to drive the connected equipment under the design conditions specified and within normal operating ranges. For each motor furnished, the nameplate horsepower

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS: continued

rating multiplied by the service factor shall equal or exceed the horsepower required to drive the connected equipment under any operating condition.

2.03 MOTORS RATED 1/2-HORSEPOWER AND SMALLER:

- A. Rated 115 volts, single phase, 60 hertz.
- B. Service factor of 1.0.
- C. The torque characteristics of each motor at all voltages from 90 to 110% rated voltage shall be as required to accelerate the motor and driven equipment to full speed without damage to the motor or the driven equipment.
- D. All windings shall be copper. Aluminum windings will not be accepted.
- E. Insulation shall be Class B or Class F, with Class B temperature rise in accordance with NEMA MG 1.
- F. Enclosures shall be fabricated of steel.
- G. Horizontal motors shall be mounted on a common baseplate with the driven equipment.
- H. Manual reset thermal overload protection shall be furnished integral to each motor.
- I. Enclosures shall be totally enclosed non-ventilated.
- J. Enclosures for indoor service shall be totally enclosed non-ventilated.
- K. Enclosures for outdoor service shall be totally enclosed non-ventilated, dust ignition-proof, with an external surface temperature limiting device wired into the motor power leads.

2.04 MOTORS RATED 3/4- THROUGH 200 HORSEPOWER:

- A. Rated 460 volts, 3 phase, 60 hertz.
- B. Service factor of 1.15 for all enclosures except for explosion-proof or dust ignition-proof enclosures which shall have a service factor of 1.0.
- C. Enclosures shall be fabricated of cast iron or steel.
- D. Enclosures shall be totally enclosed non-ventilated or totally enclosed fan cooled.
- E. Enclosures for outdoor service shall be totally enclosed non-ventilated or totally enclosed fan cooled.
- F. Bearings shall be antifriction type, and shall have an ABMA L-10 rating life of not less than 80,000 hours at rated speed, and under the radial and/or thrust loadings encountered within normal operating ranges. The thrust loading corresponding to an ABMA L-10 rating life of 5,000 hours at rated speed shall not be exceeded under any operating condition of the motor or the driven equipment.
- G. Bearings shall be insulated when required to allow for inverter duty operation or to prevent bearing or shaft damage due to stray shaft currents.
- H. Each horizontal motor shall be mounted on a common baseplate with the driven equipment, or shall be furnished with separate sole plates and sub-sole plates to permit removal of the motor without disturbing the alignment of the driven equipment.
- I. Furnish space heaters for all outdoor motors rated 25 horsepower and above. Space heaters shall be rated 120 volts, single phase, 60 hertz.
- J. Additional requirements for motors rated 3/4- through 200 horsepower:
 - 1. The torque characteristics of each motor at all voltages from 90 to 110% rated voltage shall be as required to accelerate the motor and driven equipment to full speed without damage to the motor or the driven equipment.
 - 2. Insulation shall be Class F, with Class B temperature rise at rated horsepower in accordance with NEMA MG 1 unless specified elsewhere.
 - 3. Where combined motor and driven equipment sound levels are specified for items of equipment, systems, or areas, motor sound levels shall be coordinated with driven equipment sound levels to meet the overall sound levels specified. The motor "A"

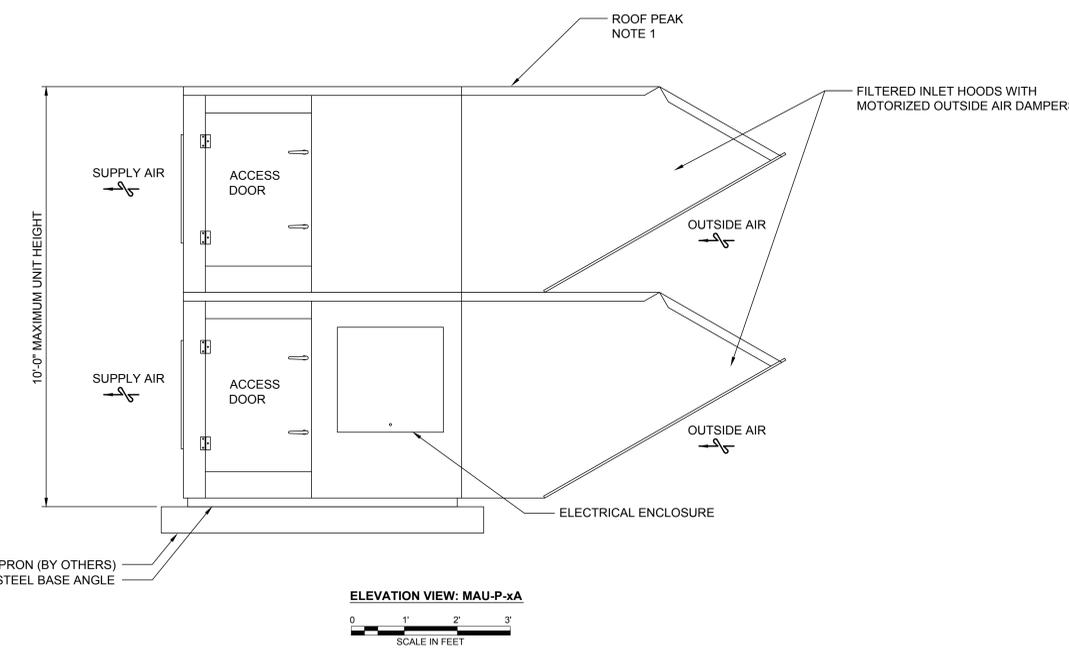
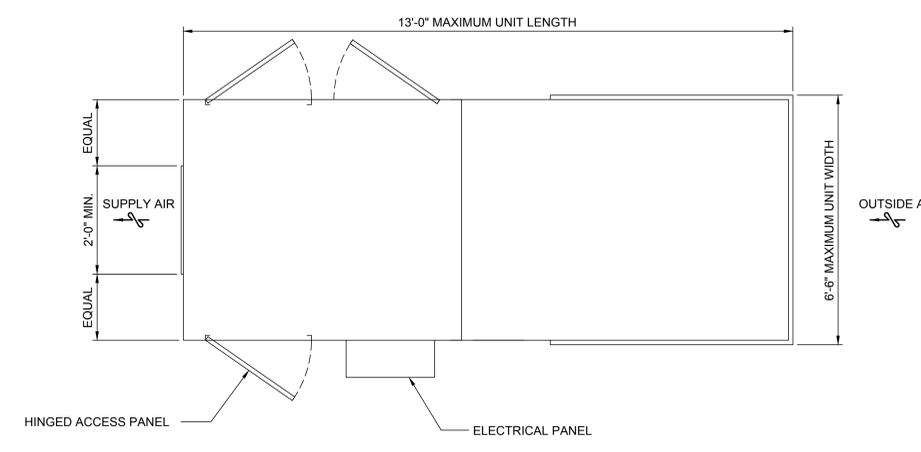
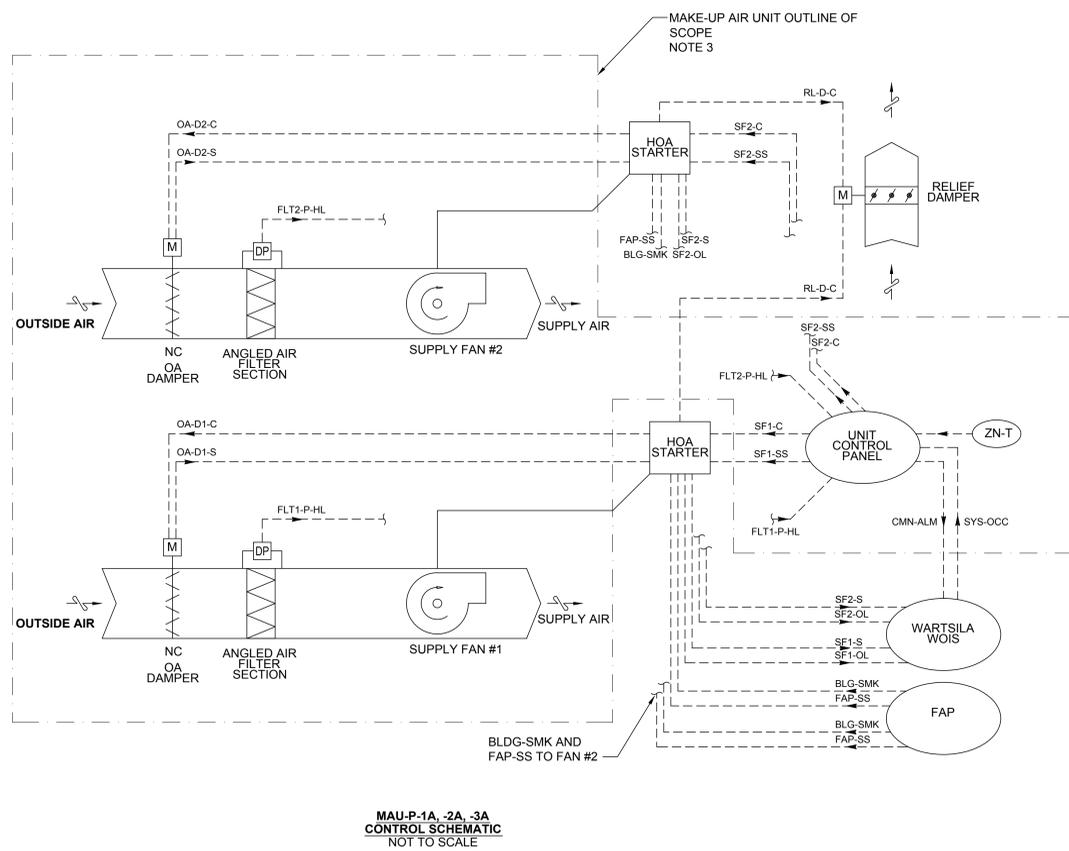
SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS: continued

weighted sound pressure level shall not in any event exceed 90 dB when measured at a reference distance of 1 meter per IEEE 85.

4. The efficiency of each horizontal single-speed motor shall not be less than that indicated in Table 12-11 of NEMA MG1.
- K. Motors shall be of special high efficiency and high power factor design, including the following design features:
1. Low loss lamination steel.
 2. Increased stator and rotor length.
 3. Increased winding cross section.
 4. High efficiency cooling fan design.
 5. Optimized slot configuration and air gap.
- L. Unless otherwise specified, the efficiency of each motor shall meet or exceed all NEMA Premium Requirements for energy efficiency, with efficiency values certified by NEMA MG1.12.53, both A and B Standards.
- M. Information submitted with the proposal for each motor shall include minimum guaranteed efficiency based on tests performed in accordance with IEEE 112, Method B, with accuracy improvement by segregated loss determination including stray load loss measurement. Information submitted with the proposal shall include percent efficiency and percent power factor at full load, 3/4-load, and 1/2-load.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 260551



- NOTES:**
- ROOF MUST BE SLOPED TO PREVENT MOISTURE ACCUMULATION. CHARGE AIR UNIT SHALL BE MOUNTED LEVEL.
 - STARTER AND H-O-A SWITCH SHALL BE PROVIDED BY OTHERS AND LOCATED REMOTELY.
 - ALL CONTROL ITEMS WITHIN OUTLINE OF SCOPE SHALL BE PROVIDED BY UNIT MANUFACTURER.

MAKE-UP AIR UNIT SCHEDULE (MAU)	
OUTDOOR UNITS (SPECIFICATION 237434)	
TAG NO.	MAU-P-1A, MAU-P-2A, MAU-P-3A
QUANTITY OF UNITS TO BE PROVIDED	3
FUNCTION	AUXILIARY-SIDE (WEST) ENGINE HALL VENTILATION
ARRANGEMENT	VERTICALLY STACKED HORIZONTAL
TYPE / ARRANGEMENT	DRAW THROUGH
SERVICE	CONSTANT VOLUME
ALTITUDE (FT)	1,000
TOTAL AIRFLOW	35,000
FAN/MOTOR QUANTITY PER UNIT	2
FAN (EACH)	PLENUM / AF OR FORWARD CURVED
DRIVE TYPE	BELT
MINIMUM STATIC EFFICIENCY	40%
SUPPLY AIRFLOW (CFM)	17,500
OUTSIDE AIRFLOW (CFM)	17,500
EXTERNAL STATIC PRESS. (IN WC)	0.4
TOTAL STATIC PRESS. (IN WC)	NOTE 1
MOTOR (EACH)	
MOTOR POWER (HP)	10
MOTOR RPM	1800
MOTOR TYPE	TEFC-PE
ELECTRICAL DATA (V/PH/Hz)	460 / 3 / 60
FILTERS	PRE-FILTER
EFFICIENCY	MERV 8
REMARKS	1,2,3,4,5

- NOTES:**
- PRESSURE DROPS ASSOCIATED WITH FILTERS, DAMPERS, ETC. SHALL BE INCLUDED IN THE TOTAL INTERNAL STATIC CALCULATION BY THE UNIT MANUFACTURER.
 - PROVIDE WITH UNIT MOUNTED DISCONNECT AND CONTROL PANEL.
 - ALL MAKE-UP AIR UNITS SHALL BE THE SAME MANUFACTURER.
 - STARTER AND H-O-A PROVIDED BY OTHERS.
 - MOTORS SHALL BE NON-OVERLOADING ACROSS ENTIRE FAN CURVE.

SYSTEM: MAU-P-1A, -2A, -3A SEQUENCE OF OPERATION

A. HAND-OFF-AUTO SWITCH: SUPPLY FAN MOTOR STARTER SHALL ACCEPT A FIRE ALARM PANEL SIGNAL (FAP-SS OR BLG-SMK) THAT TAKES PRECEDENCE OVER ALL OTHER STARTER INPUTS AND SWITCHES AND SHALL START THE FAN (FAP-SS) OR STOP THE FAN (BLG-SMK). EACH SUPPLY FAN MOTOR STARTER SHALL HAVE AN H-O-A SWITCH:

- HAND: WITH THE H-O-A SWITCH IN HAND POSITION, THE SUPPLY AIR DAMPER SHALL OPEN, THE RELIEF DAMPER SHALL OPEN, AND THE SUPPLY FAN SHALL START AND RUN CONTINUOUSLY. SUBJECT TO SAFETIES.
- OFF: WITH THE H-O-A SWITCH IN OFF POSITION, THE SUPPLY FAN SHALL STOP. THE RELIEF AIR DAMPER SHALL BE CLOSED AND THE SUPPLY AIR DAMPER SHALL BE CLOSED.
- AUTO: WITH THE H-O-A SWITCH IN AUTO POSITION, THE SUPPLY FAN SHALL RUN (AND THE OUTSIDE AIR & RELIEF AIR DAMPERS SHALL BE CONTROLLED) SUBJECT TO THE SUPPLY FAN START/STOP (SF-SS) COMMAND AND SAFETIES.

B. OCCUPANCY MODES: THE SYSTEM SHALL OBTAIN ITS OCCUPANCY MODE INPUT FROM THE WARTSILA WOIS. THE SYSTEM SHALL OPERATE IN ONE OF THE FOLLOWING MODES:

- OCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE OCCUPIED MODE WHEN A COMMAND TO START INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
- UNOCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE UNOCCUPIED MODE WHEN A COMMAND TO STOP INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).

C. SYSTEM ENABLE AND LOOP ENABLE

- OCCUPIED MODE: THE UNIT CONTROLLER SHALL OPERATE THE SUPPLY FANS IN A LEAD/LAG CONFIGURATION AND ROTATE THE LEAD FAN BASED ON RUN-TIME. WHEN ONE OR BOTH SUPPLY FANS ARE ENABLED AND COMMANDED TO RUN (SF1-SS AND/OR SF2-SS) THE RESPECTIVE OUTSIDE AIR DAMPER SHALL BE OPEN, AND THE RELIEF AIR DAMPER SHALL BE OPEN. IN OCCUPIED MODE, THE FAN LEAD-LAG CONTROL LOOP SHALL BE ENABLED.
- UNOCCUPIED MODE: ALL CONTROL LOOPS SHALL BE DISABLED. THE SUPPLY AIR DAMPER SHALL BE CLOSED, THE RELIEF AIR DAMPER SHALL BE CLOSED AND THE SUPPLY FAN SHALL BE OFF.

D. PROOFS AND SAFETIES

- THE SUPPLY FAN AND ALL CONTROL LOOPS SHALL BE SUBJECT TO PROOFS AND SAFETIES. STARTER SAFETIES SHALL BE DIRECT-HARDWARE INTERLOCKED. CONTROL PANEL SHALL MONITOR ALL SAFETIES AND ACTIVATION OF ANY SAFETY SHALL RESULT IN ALL CONTROL LOOPS BEING DISABLED AND THE SUPPLY FAN BEING COMMANDED OFF UNTIL RESET.
- PROOFS:
 - SUPPLY FAN #1 STATUS (SF1-S).
 - SUPPLY FAN #2 STATUS (SF2-S).
 - SUPPLY FAN #1 OVERLOAD (SF1-OL).
 - SUPPLY FAN #2 OVERLOAD (SF2-OL).
 - OUTSIDE AIR DAMPER #1 STATUS (OA-D1-S).
 - OUTSIDE AIR DAMPER #2 STATUS (OA-D2-S).
- SAFETIES:
 - BUILDING SMOKE DETECTION (BLG-SMK).
 - HE UNIT SHALL RUN SUBJECT TO ALL THE UNIT MANUFACTURER'S SAFETIES.
 - HARDWARE RESET OF SAFETIES SHALL BE VIA THE LOCAL CONTROL PANEL.

E. FAN LEAD-LAG CONTROL LOOP: WHEN THIS LOOP IS ENABLED, THE CONTROL HARDWARE SHALL COMMAND THE FAN S TO START AND STOP (SF-SS) IN A LEAD-LAG SEQUENCE TO CONTROL ZONE VENTILATION TEMPERATURE (ZN-T) AT SETPOINT (ZN-T-SP). WHEN THIS LOOP IS DISABLED, THE CONTROL HARDWARE SHALL STOP THE FANS.

MAU-P-1A, -2A, -3A: POINTS SCHEDULE

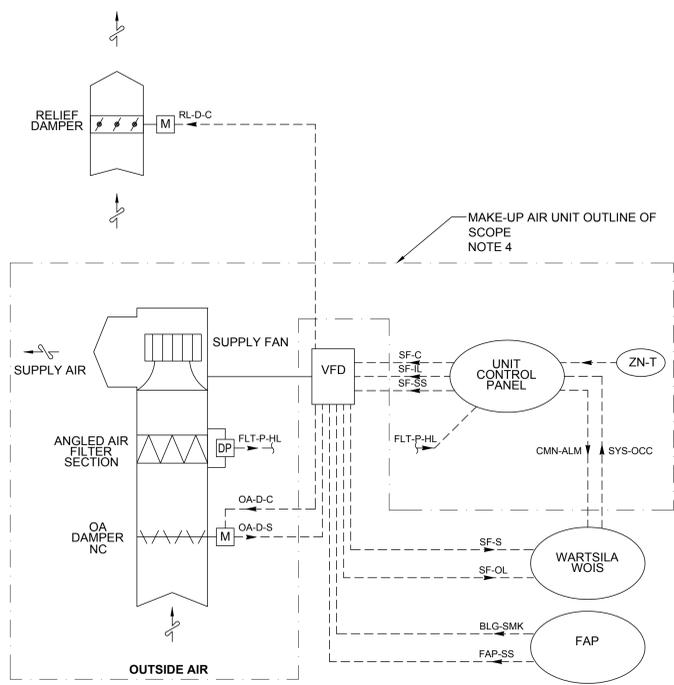
FUNCTION	NAME	DESCRIPTION	SETTINGS WITH UNITS	RANGE WITH UNITS	I/O TYPE (NOTE 6)	ALARM CONDITION	WIRING PROVIDED UNDER CONTRACT	REMARKS
CONTROL FUNCTIONS: UNIT CONTROL PANEL								
PROOFS AND SAFETIES	PROOFS AND SAFETIES	UNIT MANUFACTURER'S SAFETIES	--	ALARM/NORMAL	NOTE 3	ALARM	C4440	--
	START/STOP	SYS-OCC	OCCUPANCY INPUT (FROM WARTSILA WOIS)	--	OCCUP/OCC	BI	C8410	--
		SF1-SS	SUPPLY FAN #1 START/STOP	--	ON/OFF	BO	C8410	--
	SF2-SS	SUPPLY FAN #2 START/STOP	--	ON/OFF	BO	C8410	--	
SUPPLY FAN CONTROL	ZN-T	ZONE TEMPERATURE	--	0 - 120 DEG F	BI	--	C8410	NOTE 2
	ZN-T-SP	ZONE TEMPERATURE SETPOINT	90 DEG F	90 - 100 DEG F	--	--	C4440	NOTE 1
OTHER POINTS	FLT1-P-HL	FILTER #1 PRESSURE HIGH LIMIT SWITCH	0.70 IN WC	ALARM/NORMAL	BI	ALARM	C4440	NOTE 1
	FLT2-P-HL	FILTER #2 PRESSURE HIGH LIMIT SWITCH	0.70 IN WC	ALARM/NORMAL	BI	ALARM	C4440	NOTE 1
	CMN-ALM	COMMON ALARM	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
CONTROL FUNCTIONS: STARTER								
PROOFS AND SAFETIES	SF1-S	SUPPLY #1 FAN STATUS	--	ON/OFF	BO	PROOF FAILED (NOTE 4)	C8410	--
	SF2-S	SUPPLY #2 FAN STATUS	--	ON/OFF	BO	PROOF FAILED (NOTE 4)	C8410	--
	SF1-OL	SUPPLY #1 FAN OVERLOAD	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
	SF2-OL	SUPPLY #2 FAN OVERLOAD	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
	BLG-SMK	BUILDING SMOKE DETECTION	--	ALARM/NORMAL	BI	ALARM (NOTE 5)	C8410	--
START/STOP	FAP-SS	FIRE ALARM PANEL EMERGENCY START	--	ON/OFF	BI	--	C8410	--
OTHER POINTS	OA-D1-C	OUTSIDE AIR DAMPER #1 COMMAND	--	OPEN/CLOSED	BO	--	C4440	NOTE 4
	OA-D1-S	OUTSIDE AIR DAMPER #1 STATUS	--	OPEN/CLOSED	BI	--	C4440	--
	OA-D2-C	OUTSIDE AIR DAMPER #2 COMMAND	--	OPEN/CLOSED	BO	--	C4440	--
	OA-D2-S	OUTSIDE AIR DAMPER #2 STATUS	--	OPEN/CLOSED	BI	--	C4440	--
	RL-D-C	RELIEF AIR DAMPER COMMAND	--	OPEN/CLOSED	BO	--	C8410	NOTE 7

- NOTES:**
- ALL SETPOINTS SHALL BE ADJUSTABLE.
 - ZONE TEMPERATURE SENSOR SHARED WITH GENERATOR SIDE MAU SERVING SAME ENGINE.
 - INTERNAL TO MANUFACTURER'S CONTROL SYSTEM.
 - ALARM GENERATED BY WARTSILA WOIS.
 - ALARM GENERATED BY FIRE ALARM PANEL (FAP).
 - IO TYPE WITH RESPECT TO UNIT CONTROL PANEL OR STARTER AS INDICATED.
 - DAMPER SHALL BE HARD WIRED FROM STARTER.
- ABBREVIATIONS AND ACRONYMS**
- | | | | | | |
|---|----------|----|---------------|------|---|
| - | N/A | AI | ANALOG INPUT | PI | PROPORTIONAL-INTEGRAL CONTROL |
| X | REQUIRED | AO | ANALOG OUTPUT | WOIS | GENERATOR MANUFACTURER'S CONTROL SYSTEM |
| | | BI | BINARY INPUT | | |
| | | BO | BINARY OUTPUT | | |

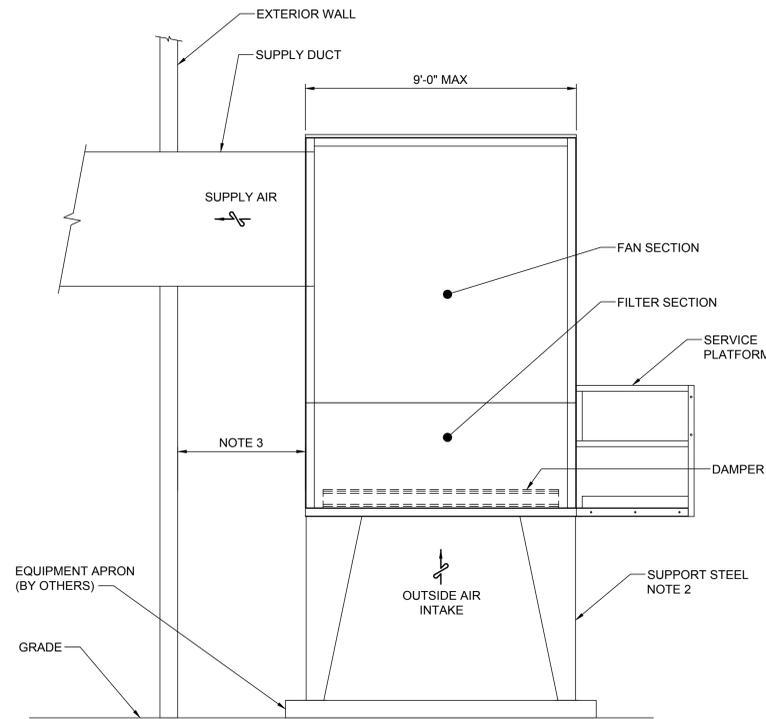
COPYRIGHT © 2015 BURNS & MCDONNELL ENGINEERING COMPANY, INC.

no.	date	by	ckd	description	no.	date	by	ckd	description
0	02/16/15	RW	BN	ISSUED FOR BID					

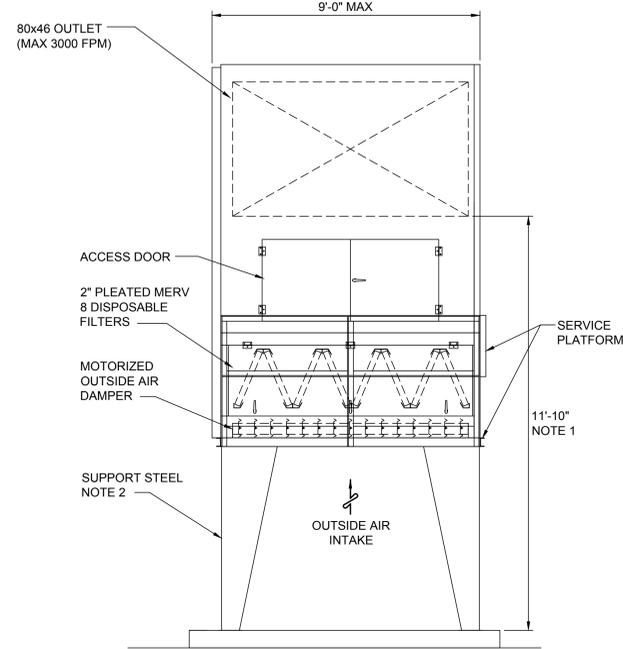
<p>9400 WARD PARKWAY KANSAS CITY, MO 64114 816-333-9400 FIRM LICENSE NO. CA-421 06/30/16</p>			<p>STILLWATER ENERGY CENTER POWER BLOCK BUILDING AUXILIARY SIDE MAKE-UP AIR UNIT DETAILS</p> <p>project 75644 contract C4440</p> <p>drawing MH801 rev. 0</p> <p>sheet of sheets</p> <p>file 75644_MH801.DWG</p>
designed R. WEAVER	detailed R. WEAVER	STILLWATER, OKLAHOMA	



MAU-P-1B, -2B, -3B
CONTROL SCHEMATIC
NOT TO SCALE



SIDE VIEW: MAU-P-xB
SCALE IN FEET



ELEVATION VIEW: MAU-P-xB
SCALE IN FEET

- NOTES:**
- BOTTOM OF SUPPLY AIR OUTLET SHALL BE LOCATED BETWEEN 10'-0" and 12'-6" AFF.
 - MAU-P-xB SHALL BE SUPPORTED BY FULL STEEL FRAME OR STEEL LEGS. REFER TO SPECIFICATION FOR REQUIREMENTS.
 - UNIT WILL BE LOCATED 36 INCHES FROM BUILDING WALL. MANUFACTURER'S DESIGN OF REQUIRED SUPPORT FRAME/LEG HEIGHT SHALL ONLY INCLUDE THREE SIDES FOR INTAKE AIRFLOW.
 - ALL CONTROL ITEMS WITHIN OUTLINE OF SCOPE SHALL BE PROVIDED BY THE MANUFACTURER.

MAKE-UP AIR UNIT SCHEDULE (MAU)	
OUTDOOR UNITS (SPECIFICATION 237433)	
TAG NO.	MAU-P-1B, MAU-P-2B, MAU-P-3B
QUANTITY OF UNITS TO BE PROVIDED	3
FUNCTION	GENERATOR-SIDE (EAST) ENGINE HALL VENTILATION
ARRANGEMENT	VERTICAL UPFLOW
TYPE / ARRANGEMENT	DRAW THROUGH
SERVICE	VARIABLE VOLUME
ALTITUDE (FT)	1,000
TOTAL AIRFLOW	70,000
FAN/MOTOR QUANTITY PER UNIT	1
FAN	PLENUM / AIR FOIL
DRIVE TYPE	BELT
MINIMUM STATIC EFFICIENCY	40%
SUPPLY AIRFLOW (CFM)	70,000
OUTSIDE AIRFLOW (CFM)	70,000
EXTERNAL STATIC PRESS. (IN WC)	0.4
TOTAL STATIC PRESS. (IN WC)	NOTE 1
MOTOR	
MOTOR POWER (HP)	30
MOTOR RPM	1800
MOTOR TYPE	TEFC-PE
ELECTRICAL DATA (V/PH/Hz)	460 / 3 / 60
FILTERS	PRE-FILTER
EFFICIENCY	MERV 8
REMARKS	1,2,3,4

NOTES:

- PRESSURE DROPS ASSOCIATED WITH FILTERS, DAMPERS, ETC. SHALL BE INCLUDED IN THE TOTAL INTERNAL STATIC CALCULATION BY THE UNIT MANUFACTURER.
- PROVIDE WITH UNIT MOUNTED DISCONNECT AND CONTROL PANEL.
- ALL MAKE-UP AIR UNITS SHALL BE THE SAME MANUFACTURER.
- PROVIDE WITH REMOTE MOUNTED VFD DRIVE.

SYSTEM: MAU-P-1B, -2B, -3B SEQUENCE OF OPERATION

UNLESS OTHERWISE SPECIFIED, ALL MODULATING CONTROL SHALL BE PROPORTIONAL-INTEGRAL (PI) CONTROL.

- A. HAND-OFF-AUTO SWITCH:**
SUPPLY FAN VARIABLE FREQUENCY DRIVE (VFD) UNIT SHALL ACCEPT A FIRE ALARM PANEL SIGNAL (FAP-SS OR BLG-SMK) THAT TAKES PRECEDENCE OVER ALL OTHER VFD INPUTS AND SWITCHES AND SHALL CAUSE THE VFD TO RUN AT 100% SPEED (FAP-SS) OR 0% SPEED (BLG-SMK). THE SUPPLY FAN VARIABLE FREQUENCY DRIVE (VFD) UNIT SHALL HAVE AN INTEGRAL H-O-A SWITCH:
(1) HAND: WITH THE H-O-A SWITCH IN HAND POSITION, THE SUPPLY AIR DAMPER SHALL BE OPEN, THE RELIEF AIR DAMPER SHALL BE OPEN, AND THE SUPPLY FAN SHALL START AND RUN CONTINUOUSLY, SUBJECT TO SAFETIES. FAN SPEED SHALL BE UNDER MANUAL OPERATOR CONTROL.
(2) OFF: WITH THE H-O-A SWITCH IN OFF POSITION, THE SUPPLY FAN SHALL STOP, THE RELIEF AIR DAMPER SHALL BE CLOSED AND THE SUPPLY AIR DAMPER SHALL BE CLOSED.
(3) WITH THE H-O-A SWITCH IN AUTO POSITION, THE SUPPLY FAN SHALL RUN (AND THE OUTSIDE AIR & RELIEF AIR DAMPERS SHALL BE CONTROLLED) SUBJECT TO THE SUPPLY FAN START/STOP SIGNAL (SF-SS) AND SAFETIES. FAN SPEED SHALL BE UNDER CONTROL OF THE UNIT CONTROL PANEL.
- B. OCCUPANCY MODES:** THE SYSTEM SHALL OBTAIN ITS OCCUPANCY MODE INPUT FROM THE WARTSILA WOIS. THE SYSTEM SHALL OPERATE IN ONE OF THE FOLLOWING MODES:
(1) OCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE OCCUPIED MODE WHEN A COMMAND TO START INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
(2) UNOCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE UNOCCUPIED MODE WHEN A COMMAND TO STOP INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
- C. SYSTEM ENABLE AND LOOP ENABLE**
(1) OCCUPIED MODE: THE OUTSIDE AIR DAMPER SHALL BE OPEN, THE RELIEF AIR DAMPER SHALL BE OPEN, AND THE SUPPLY FAN SHALL BE ENABLED. THE FAN CAPACITY CONTROL LOOP SHALL BE ENABLED.
(2) UNOCCUPIED MODE: ALL CONTROL LOOPS SHALL BE DISABLED. THE OUTDOOR AIR DAMPER SHALL BE CLOSED, THE RELIEF AIR DAMPER SHALL BE CLOSED, AND THE SUPPLY FAN SHALL BE OFF.
- D. PROOFS AND SAFETIES**
(1) THE SUPPLY FAN AND ALL CONTROL LOOPS SHALL BE SUBJECT TO PROOFS AND SAFETIES. VFD SAFETIES SHALL BE DIRECT-HARDWARE INTERLOCKED. CONTROL PANEL SHALL MONITOR ALL SAFETIES AND ACTIVATION OF ANY SAFETY SHALL RESULT IN ALL CONTROL LOOPS BEING DISABLED AND THE SUPPLY FAN BEING COMMANDED OFF UNTIL RESET.
(2) PROOFS:
(A) SUPPLY FAN STATUS (SF-S)
(B) SUPPLY FAN OVERLOAD (SF-OL)
(C) OUTSIDE AIR DAMPER STATUS (OA-D-S)
(3) SAFETIES:
(A) BUILDING SMOKE DETECTION (BLG-SMK)
(B) THE UNIT SHALL RUN SUBJECT TO ALL THE UNIT MANUFACTURER'S SAFETIES.
(C) UNIT DISCONNECT (SF-IL). INTERLOCK PREVENTS OPERATION OF VFD WHEN UNIT DISCONNECT IS OPEN.
(D) HARDWARE RESET OF ALL SAFETIES SHALL BE VIA THE LOCAL CONTROL PANEL.
- E. FAN CAPACITY CONTROL LOOP:** WHEN THIS LOOP IS ENABLED, THE CONTROL HARDWARE SHALL COMMAND THE FAN TO START (SF-SS) AND MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVE UNIT TO MAINTAIN THE ZONE VENTILATION TEMPERATURE (ZN-T) AT SETPOINT (ZN-T-SP). WHEN THIS LOOP IS DISABLED, THE CONTROL HARDWARE CAPACITY MODULATION OUTPUT TO THE VFD SHALL BE ZERO PERCENT.

FUNCTION	NAME	DESCRIPTION	SETTINGS WITH UNITS	RANGE WITH UNITS	I/O TYPE (NOTE 6)	ALARM CONDITION	WIRING PROVIDED UNDER CONTRACT	REMARKS
CONTROL FUNCTIONS: UNIT CONTROL PANEL								
PROOFS AND SAFETIES	SF-IL	SUPPLY FAN INTERLOCK	--	ON/OFF	BO	--	C8410	NOTE 9
START/STOP	SYS-OCC	OCCUPANCY INPUT (FROM WARTSILA WOIS)	--	OCC/UNOCC	BI	ALARM	C4440	--
SUPPLY FAN	SF-SS	SUPPLY FAN START STOP	--	ON/OFF	BO	--	C8410	--
CAPACITY CONTROL	ZN-T	ZONE TEMPERATURE	--	0 - 120 DEG F	BI	--	C8410	NOTE 2
OTHER POINTS	ZN-T-SP	ZONE TEMPERATURE SETPOINT	80 DEG F	50 - 100 DEG F	--	--	C4440	NOTE 1
	SF-C	SUPPLY FAN COMMAND	0-100%	AO	--	--	C8410	--
	FLT-P-HL	FILTER PRESSURE HIGH LIMIT SWITCH	0.70 IN WC	ALARM/NORMAL	BI	ALARM	C4440	NOTE 1
	CMN-ALM	COMMON ALARM	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
CONTROL FUNCTIONS: VARIABLE FREQUENCY DRIVE								
PROOFS AND SAFETIES	SF-S	SUPPLY FAN STATUS	--	ON/OFF	BO	PROOF FAILED (NOTE 4)	C8410	--
START/STOP	SF-OL	SUPPLY FAN OVERLOAD	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
	BLG-SMK	BUILDING SMOKE DETECTION	--	ALARM/NORMAL	BI	ALARM (NOTE 5)	C8410	--
	FAP-SS	FIRE ALARM PANEL EMERGENCY START	--	ON/OFF	BI	--	C8410	--
OTHER POINTS	OA-D-C	OUTSIDE AIR DAMPER COMMAND	--	OPEN/CLOSED	BO	--	C4440	NOTE 7
	OA-D-S	OUTSIDE AIR DAMPER STATUS	--	OPEN/CLOSED	BI	--	C4440	NOTE 7
	RL-D-C	RELIEF AIR DAMPER COMMAND	--	OPEN/CLOSED	BO	--	C8410	NOTE 7

NOTES:
1. ALL SETPOINTS SHALL BE ADJUSTABLE.
2. ZONE TEMPERATURE SENSOR SHARED WITH AUXILIARY SIDE MAU SERVING SAME ENGINE.
3. INTERNAL TO MANUFACTURER'S CONTROL SYSTEM.
4. ALARM GENERATED BY WARTSILA WOIS.
5. ALARM GENERATED BY FIRE ALARM PANEL (FAP).
6. I/O TYPE WITH RESPECT TO UNIT CONTROL PANEL OR VFD AS INDICATED.
7. DAMPER SHALL BE HARD WIRED FROM VFD.
8. NOT USED.
9. INTERLOCK GENERATED FROM CONTROL PANEL OR RELAY WITHIN UNIT.

ABBREVIATIONS AND ACRONYMS
AI ANALOG INPUT
AO ANALOG OUTPUT
BI BINARY INPUT
BO BINARY OUTPUT
PI PROPORTIONAL-INTEGRAL CONTROL
WOIS GENERATOR MANUFACTURER'S CONTROL SYSTEM

COPYRIGHT © 2015 BURNS & MCDONNELL ENGINEERING COMPANY, INC.

no.	date	by	ckd	description	no.	date	by	ckd	description
0	02/16/15	RW	BN	ISSUED FOR BID					

<p>9400 WARD PARKWAY KANSAS CITY, MO 64114 816-333-9400 FIRM LICENSE NO. CA-421 06/30/16</p>		<p>STILLWATER, OKLAHOMA</p>		<p>STILLWATER ENERGY CENTER POWER BLOCK BUILDING GENERATOR SIDE MAKE-UP AIR UNIT DETAILS</p>	
				<p>project 75644 contract C4440</p>	<p>drawing MH802 rev. 0</p>
<p>designed R. WEAVER detailed R. WEAVER</p>		<p>sheet of sheets</p>		<p>file 75644_MH802.DWG</p>	

Table of Contents

Contract C4440

Ventilation Fans

Contract..... 2
Bond and Insurance Supplement..... 4
Performance Bond..... 7
Statutory Bond..... 9

ATTACHMENT A – Commercial Terms & Conditions

ATTACHMENT B – Drawings & Technical Specifications

Contract

THIS CONTRACT AND AGREEMENT, made and entered into this ____ day of ____, 2015, (the "Effective Date") by and between Coffeyville Municipal Light & Power, Coffeyville, Kansas, and AbsolutAire, Inc., hereinafter called the "Supplier",

WITNESSETH:

THAT WHEREAS, Coffeyville Municipal Light & Power has caused to be prepared in accordance with the law, certain plans, Specifications, and other documents for the Work hereinafter described, and has approved and adopted all of said Contract documents for

C4440 – Ventilation Fans Bid #16-14/15

as outlined and set out in the Contract documents and in accordance with the terms and provisions of this Contract; and,

WHEREAS, the Supplier, in response to said solicitation for Bids; has submitted Coffeyville Municipal Light & Power in the manner and at the time specified, a sealed Bid in accordance with the terms of this Contract; and,

WHEREAS, Coffeyville Municipal Light & Power has duly awarded this Contract to said Supplier, for the sum named in the proposal to wit:

Two hundred twenty-five thousand one hundred eighty-eight dollars and no cents
(\$225,188.00)

The Contract Price includes, and is further broken-down as follows:

Ventilation fans in manufactured housing with all controls, wiring, and accessories	\$ 210,341.00
Transportation (DDP Project Site, Coffeyville, KS)	\$ 12,354.00
Required Bonds	\$ 5,538.00
Spare Parts for Commissioning	\$ 1,450.00
Deduct for Duplicate Order	(\$ 4,495.00)

NOW THEREFORE, for and in consideration for the mutual agreements and covenants herein contained, the Parties to this Contract have agreed, and hereby agree as follows:

1. The Supplier shall, in a good and workmanlike manner, at his own cost and expense, furnish all labor, materials, tools, and equipment required to complete the Work in strict accordance with the Contract and the following Contract documents: Non-Collusion Affidavit, Certificate of Non-Discrimination, Non-Collusion Affidavit for Invoice Payment over \$25,000, Contract, Business Relationship Affidavit, Performance Bond, Statutory Bond, Commercial Terms and Conditions, Specifications, and addenda for Bid #16-14/15 are made a part of this Contract as fully as if the same were herein set out at length.
2. On completion of agreed Work, but prior to the acceptance thereof by Coffeyville Municipal Light & Power, it shall be the duty of a Coffeyville Municipal Light & Power representative to determine, by examination that said agreed Work has been completely and fully performed in accordance with the Contract documents. Upon completion and acceptance of such Work, any remaining amount due for that Work shall be paid to Supplier in accordance with Article 6 Payment of the Commercial Terms and Conditions.

3. Terms used in this Contract have the meaning defined in *Commercial Terms and Conditions* Article 1 Definitions.

IN WITNESS WHEREOF, the Parties hereto have caused this instrument to be executed, in three duplicate originals, the day and year first above written.

SUPPLIER:

Signature: _____

Print Name: _____

Title: _____

Date: _____

OWNER:

Signature: _____

Print Name: _____

Title: _____

Date: _____

Bond and Insurance Supplement

1. Coincident with the execution of Contract, the Successful Bidder shall furnish good and sufficient Surety company **Performance** and **Statutory Bond**.
 - a. The **Performance Bond** shall guaranty the faithful performance of all the covenants, stipulations and agreements of the Contract, including the guarantying or warranting of all Work and all material included in the Contract against defects in both workmanship and materials; any replacement because of defective materials and workmanship including freight, hauling and installation charges for the Warranty Period to be entirely at Supplier's expense.
 - b. The **Statutory Bond** shall guaranty payment of all bills and obligations arising from the execution of the Contract, which bills and obligations might or will in any manner become a claim against the Owner. All provisions of the bond shall be complete and in full accordance with Statutory requirements.
 - c. All bonds shall be executed with the proper sureties through a company licensed and duly qualified to operate in the State of Kansas, and approved by the Owner.
 - d. Bonds shall be signed by an agent resident with the State of Kansas who shall furnish evidence of his authority to bind the Surety as valid to the date of the bond. The date of the bond shall be the date of execution of the Contract. If at any time during the continuance of the Contract the Surety on the Company's bond becomes irresponsible, the Owner shall have the right to require additional and sufficient sureties which the Supplier shall furnish to the satisfaction of the Owner within ten (10) Days after notice to do so. In default thereof, the Contract may be suspended and all payments or money due the Supplier withheld.
 - e. All bonds shall be U. S. Treasury listed (Circular #570) as acceptable to the US Government. Acceptable bonds shall only be those supplied by "on shore" corporations.
2. Coincident with the execution of Contract, the Successful Bidder shall purchase and maintain such **Liability Insurance** as will protect it from claims set forth below which may arise out of or result from its operations under the Contract, whether such operations be by itself or by a sub-Contractor, Sub-Supplier or by anyone directly or indirectly employed by them, or by anyone for whose acts any of them may be liable:
 - a. Claims under Workers' Compensation, disability, benefits and other similar employee benefits acts: For the duration of this Contract, Supplier shall maintain statutory **Workers' Compensation** and shall maintain **Employer's Liability Insurance** with minimum limits to one million dollars (\$1,000,000). Supplier shall require sub-Contractors to provide Workers' Compensation and Employer's Liability Insurance with the same minimum limits.

- b. Claims for damages because of bodily injury, occupational sickness or disease, or death of his Employees, and his claims insured by usual personal injury liability coverage: For the duration of this Contract, Supplier shall maintain statutory **Workers' Compensation** and shall maintain **Employer's Liability Insurance** with minimum of one million dollars (\$1,000,000). Supplier shall require sub-Contractors to provide Workers' Compensation and Employer's Liability Insurance with the same minimum limits.
- c. Claims for damages because of bodily injury, sickness or diseases or death of any person other than his employees, and claims insured by usual personal injury liability coverage: For the duration of this Contract, Supplier shall maintain occurrence-based **Comprehensive General Liability Insurance** with minimum bodily injury limits of five-hundred thousand dollars (\$500,000.00) for each person and one million dollars (\$1,000,000.00) for each occurrence. Supplier shall maintain property damage insurance with minimum limits of five hundred thousand dollars (\$500,000.00) for each occurrence and one million dollars (\$1,000,000.00) aggregate. The policy shall include Supplier's Protective Liability Insurance with the same minimum limits. Supplier shall require sub-Contractors to provide Comprehensive General Liability Insurance with the same minimum limits.
- d. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting there from: For the duration of this Contract, Supplier shall maintain **Comprehensive Liability Insurance** with minimum bodily injury limits of five hundred thousand dollars (\$500,000.00) for each person and one million dollars (\$1,000,000.00) for each occurrence. Supplier shall maintain property damage insurance with minimum limits of five hundred thousand dollars (\$500,000.00) for each occurrence and one million dollars (\$1,000,000.00) aggregate. The policy shall include Supplier's Protective Liability Insurance with the same minimum limits. Supplier shall require sub-Contractors to provide Comprehensive Liability Insurance with the same minimum limits.
- e. For the duration of this Contract, Supplier shall maintain **Comprehensive Automobile Liability Insurance** for all owned, non-owned, and hired vehicles with minimum limits for bodily injury of five hundred thousand dollars (\$500,000.00) for each person and one million dollars (\$1,000,000.00) for each occurrence and property damage minimum limits of five hundred thousand dollars (\$500,000.00). Supplier shall require sub-Contractors to provide Comprehensive Automobile Liability Insurance with the same limits
- f. Umbrella or Excess Liability: Contractor shall purchase and maintain occurrence-based **Umbrella or Excess Liability Insurance** written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above in the amount of four million dollars (\$4,000,000.00). Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

Certificates of Insurance acceptable to the Owner shall be filed by Successful Bidder with the Owner prior to commencement of the Work. These certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least fifteen (15) days prior written notice has been given to the Owner. Copies of certificates of insurance shall be filed with the Owner prior to commencing Work. The required insurance must be written by a company licensed to do business in the state where the Work is located, at the time the policy is issued. In addition, the company must be acceptable to the Owner. The City of Coffeyville/Coffeyville Municipal Light & Power, its officers, employees, and agents, shall be named as an additional insured on all liability insurance policies, excluding worker's compensation and employer's liability, in amounts equal to the liability limits for policies. Engineer Burns and McDonnell Engineering Company, Inc. shall be endorsed as an additional insured on CGL, Automotive and any Umbrella insurance policies to the policy limits. The insurance policies shall include a waiver of subrogation in favor of the additional insured.

Performance Bond

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal,
and _____,as Surety, a
corporation organized and existing under the laws of the State of _____,
and duly authorized to do business in the State of Kansas, are held and firmly bound
unto the COFFEYVILLE MUNICIPAL LIGHT & POWER, in the penal sum of

_____ Dollars (\$_____) lawful money of the
United States of America, such sum being equal to 100 % of the Contract Price for the
payment of which, well and truly to be made, we, and each of us, bind ourselves, our
successors, and assigns, jointly and severally, firmly by these presents.

Dated this _____ day of _____, 20_____.

The condition of this obligation is such that whereas, the above named Principal did, on
the _____ day of _____, 20_____, enter into a Contract with the
COFFEYVILLE MUNICIPAL LIGHT & POWER for the construction/services of _____

All in compliance with the plans and Specifications therefore, made a part of said
Contract, and on file in the Office of the City Clerk of the City of Coffeyville; and said
Contract is hereby made a part and parcel of this bond as if literally written herein.

NOW, THEREFORE, if said Principal shall, fully and faithfully execute the Work and
perform said Contract according to its terms and conditions, and covenants, and in exact
accordance with the Bid of said Principal, and according to certain plans and
Specifications heretofore made, adopted, and placed on file in the Office of the City Clerk
of the City of Coffeyville, as set out in the Specifications herein, and shall promptly pay,
or cause to be paid, all labor, material and/or repairs and all Bids for labor performed on

said Work, whether by Subcontract or otherwise, and shall protect and save harmless Coffeyville Municipal Light & Power and all interested property owners against all claims, demands, causes of action, losses or damage, and expense to life or property suffered or sustained by any person, firm, or corporation by reason of negligence of the Principal or his or its agents, servants, or employees in the construction/services of said Work, or by or in consequences of any improper execution of the Work or act of omission or use of inferior materials by said Principal, or his or its agents, servants, or employees and shall protect and save Coffeyville Municipal Light & Power harmless from all suits and claims of infringement or alleged infringement of patent rights or processes, then this obligation shall be void; otherwise this obligation shall remain in full force and effect.

It is further expressly agreed and understood by the Parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, from the obligation of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officer, and the said Surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed by its Attorney-in-Fact, duly authorized so to do, the day and year first above written.

ATTEST:

Secretary

Surety

(Accompany this bond with Attorney-in-Facts Authority from the Surety Company certified to include the date of the bond.)

Statutory Bond

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principals
and _____ as Surety, a
corporation organized and existing under the laws of the State of _____,
And duly authorized to do business in the State of Kansas, are held and firmly bound
unto COFFEYVILLE MUNICIPAL LIGHT & POWER, Coffeyville, Kansas in the penal
sum of _____ Dollars
(\$ _____), in lawful money of the United States, such sum being equal
to 100 % of the Contract Price for the payment of which sum, well and truly to be made,
we and each of us, bind ourselves, our successors, and assigns, jointly and severally,
firmly by these presents:

Dated this _____ day of _____, 20_____.

THE CONDITION OF THIS OBLIGATION ARE SUCH THAT WHEREAS, the above
named Principal did, on the _____ day of _____, 20_____, enter
into a Contract with the COFFEYVILLE MUNICIPAL LIGHT & POWER, Coffeyville,
Kansas for _____ All in
compliance with the plans and Specifications therefore, made a part of said Contract and
on file in the Office of the City Clerk of the City of Coffeyville.

NOW, THEREFORE, if said Principal shall fail or neglect to pay all indebtedness
incurred by said Principal, Subcontractors, or Sub-Suppliers of said Principal who
perform Work in the performance of said Contract, for labor and materials furnished by
any Supplier and consumed in the performance of said Contract, and such repairs to and
rental of machinery and equipment as may be furnished by a Subcontractor or Sub-
Supplier to the person or persons Contracting with Coffeyville Municipal Light & Power,
within Fifteen (15) Days after the same becomes due and payable, the person, firm or
corporation entitled thereto may sue and recover on this bond the amount so due and
unpaid.

NOW, THEREFORE, it is expressly agreed and understood by the Parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them from the obligations of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed by its Attorney-in-Fact, duly authorized thereunto so to do, the day and year first above written.

ATTEST:

Secretary

Surety

(Accompany this bond with Attorney-in-Fact's Authority from the Surety Company certified to include the date of the bond.)

Attachment A

Commercial Terms and Conditions



ATTACHMENT A

COMMERCIAL TERMS & CONDITIONS

Table of Contents

Attachment A..... 1

1. DEFINITIONS..... 3

2. DELIVERY..... 5

3. WARRANTY 5

4. LIQUIDATED DAMAGES 6

5. INSPECTION AND TESTING..... 7

6. PAYMENT 7

7. SECURITY FOR PERFORMANCE..... 7

8. TAXES..... 8

9. SAFETY AND PROTECTION:..... 8

10. TERMINATION..... 9

11. CHANGES..... 10

12. INDEMNIFICATION..... 10

13. PERFORMANCE OBLIGATIONS 11

14. INSURANCE..... 11

15. OTHER REMEDIES 11

16. FORCE MAJEURE 12

17. MISCELLANEOUS 13

EXHIBIT 1 – GUARANTEED DATES..... 15

EXHIBIT 2 – MILESTONE PAYMENT & CANCELLATION SCHEDULE 16

EXHIBIT 3 – PARTIAL WAIVER OF LIEN AND RELEASE OF CLAIMS..... 17

EXHIBIT 4 – FINAL WAIVER OF LIEN AND RELEASE OF CLAIMS 18

1. DEFINITIONS

“Acceptance Date” means the first date by which all of the following have occurred: (a) Supplier has delivered all the Goods and paid all Liquidated Damages due to late delivery; (b) Owner has formally accepted all the Goods; (c) and the Goods have met the Performance Guarantees.

“Alternate” means an amount proposed by Bidder as stated on the *Summary Bid Form* for certain Work activities that may be added to or deducted from the Bid amount if Owner decides to accept a corresponding change in the Work.

“Bid” means the formal offer of the Bidder submitted on the prescribed bid forms together with the required Bid security and all information submitted with the Bid that pertains to performance of the Work.

“Bidder(s)” means any person(s), firm(s), or corporation(s) submitting a Bid for the Work, or their duly authorized representatives.

“Bidder’s Total Price” means the total price in the Bid for the Work without Alternates.

“Change Order(s)” means any change(s) made to the Contract in accordance with Article 11 CHANGES.

“Closeout” means the contractual requirements that apply after Substantial Completion of the Work and before final payment, as described in SECTION 017801.

“Contract” means the contract and agreement made and entered on the Effective Date by and between the Owner and Supplier, including all appendices, attachments, exhibits, Change Orders and all amendments and modifications agreed to and signed by both Owner and Supplier.

“Contract Delivery Date” means the Day when Supplier shall deliver the Equipment as stipulated in the Contract.

“Contract Price” means the total price for the Work agreed between the Parties, as modified by Change Orders.

“Contract Time” means the period of time starting from the Effective Date that is allowed under the Contract for the Supplier to complete the Work.

“Day(s)” means (a) calendar day(s) of 24 hours measured from midnight to the next midnight.

“Deliverables” means the Submittals and other documents delivered to the Owner in performance of Work hereunder including, without limitation, design plans, models, drawings, prints, samples, transparencies, specifications, reports, manuscripts, working notes, documentation, manuals, photographs, negatives, tapes, discs, databases, software, and other information, data, and items embodied in any tangible form.

“Engineer” or “Resident Project Representative” or “CM Agent” means Burns & McDonnell Engineering Company, Inc., a Missouri Corporation, or its duly authorized representatives.

“Effective Date” means the date that the Parties entered into the Contract.

“Equipment” means a Product supplied by Supplier, with operational or nonoperational parts, whether motorized or manually operated, that may require service connections, such as wiring or piping.

“Guaranteed Dates” means the ‘No Later Than’ dates for delivery of the Equipment to the Site and for Substantial Completion as guaranteed by Supplier in Exhibit 1.

“Goods” means Submittals, supplies, Materials, Equipment, consumables, reports, documents, drawings, specifications and all other items that Supplier is required to furnish to complete this Contract.

“Liquidated Damages” means sums due from Supplier in lieu of actual damages in accordance with Article 4 LIQUIDATED DAMAGES.

“Materials” means Products that must be substantially cut, shaped, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form parts of the Work.

“Owner” means Coffeyville Municipal Light & Power.

“Party” or “Parties” means the Owner or Supplier, or both together, as the context or the usage of such term(s) may require.

“Product(s)” means item(s) purchased by Supplier for incorporation in the Work, regardless of whether they were specifically purchased for the Project or taken from the previously purchased stock, and includes Material, Equipment, system, and other terms of similar intent.

“Project” means the total construction of which the Work to be provided under this Contract is a part.

“Project Site” or “Site” means the Project location as indicated in Specifications SECTION 011100, 1.02, B.

“Point of Delivery” means the Project Site.

“Repair Work” means the materials, labor, equipment and supervision required to refinish, redesign, repurchase, repair or replace non-conforming Goods or Work including, without limitation, the disassembling, removing, replacing and re-inspecting of any equipment or obstruction preventing such Work and re-performance, repair, replacement or testing such other part of the Work, the Site or work performed by others as shall be necessary to cause the applicable portion of the Work to conform to the Contract.

“Specifications” means those portions of the contract documents in Attachment B, consisting of written technical descriptions of the Work, and covering the Goods, workmanship, and certain administrative details applicable thereto.

“Submittals” means all shop drawings, product data, and samples which are prepared by Supplier, a Sub-Supplier, or manufacturer, and submitted by Supplier to Owner as a basis for approval of the use of Equipment and materials proposed for incorporation in the Work or needed to describe proper installation, operation and maintenance, or technical properties.

“Submittal Schedule” means the table in the Specifications SECTION 013301 Appendix A.

“Substantial Completion” means the event when (i) All Goods have been delivered to the Project Site and the Owner Acceptance Date has been established, (ii) the Equipment and Materials are operating safely and all commissioning and startup field services required by Supplier per contract have completed, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the performance guarantees have been met and Warranty Period has started, and (v) Supplier has delivered to Owner all operating instructions, maintenance manuals, and warranties.

“Sub-Supplier” means an individual, firm, or corporation having a direct contract with Supplier or with any other Sub-Supplier for the performance of a part of the Work, on or off the Site.

“Successful Bidder” means the Bidder selected by the Owner for award of the Contract.

“Supplier” means the Successful Bidder that has entered into the Contract with Owner.

“Warranty Period” means the period of time specified in Article 3 WARRANTY.

“Week” means a period of seven consecutive Days.

“Work” means any and all labor, supervision, services, Goods, consumables, valuations, inspections, engineering, delivery, testing, and all other activities performed by Supplier (or the subcontractors of Supplier at any tier) in connection with the execution and timely completion of Supplier’s obligations under this Contract, including incidental Work such as start-up, inspections, programming, installation, erection or assembly of the Goods.

2. DELIVERY

- a. Goods shall be delivered by Supplier DDP Incoterms[®] 2010 to the Project Site.
- b. Price shall include cost to deliver to the Project Site, including packing per good practice and transport insurance.
- c. Risk of loss shall pass to the Owner upon delivery of the Goods to the Project Site.
- d. Title to the Goods shall pass to the Owner upon the Owner’s acceptance of the Goods.
- e. Goods shall not be manufactured or delivered without prior approval of the required Submittals.

3. WARRANTY

- a. The Supplier warrants that the Goods shall be new, fit for the intended purpose and free of defects in design, workmanship and materials. Supplier also warrants to the Owner that for

elements of any Work for which this Contract does not establish express standards of quality and fitness, such Work shall be in accordance with good industry practices and standards for the specific application.

- b. Warranty Period for the Work shall be for an eighteen (18) month period starting on the Acceptance Date by the owner, excluding labor which shall have a Warranty Period for 90 Days starting on the Acceptance Date by the Owner.
- c. If any Work fails to comply in any respect to the warranties set forth herein and Supplier has been given written notice of such noncompliance within the Warranty Period, Supplier shall, at its sole expense, promptly perform all Repair Work.
- d. Supplier shall be responsible for all costs to perform Repair Work including, without limitation, all freight and insurance charges. If Supplier does not commence correction of the Repair Work within two (2) Days following receipt of written notice from the Owner or if Supplier does not proceed diligently to complete the Repair Work, the Owner shall, at its sole discretion, have the right to perform some or all of the necessary Repair Work to remedy the defect, or have third parties perform the necessary Repair Work. In the event the Owner rejects the Goods and chooses to obtain replacement or substitute Goods or Work from someone other than Supplier, Supplier shall also be responsible to pay the Owner the increased costs, if any, between the Contract price for such Goods or Work and the cost to the Owner of obtaining the replacement or substitute Goods including, without limitation, costs incurred by the Owner to manufacture, produce or provide such Goods or Work; or engage other persons to manufacture, produce or provide such Goods or Work. The Owner shall be entitled to set off all costs incurred by the Owner related to such Repair Work from amounts owed to Supplier or to back charge and invoice Supplier for such cost.
- e. Supplier shall bear the risk of loss or damage for Work requiring Repair Work during the period of such Repair Work. If any Work must be removed from the Site, transportation charges associated with any Repair Work shall be borne by Supplier. Supplier shall revise any and all drawings and other documents, as appropriate; to reflect any changes or modifications made during Repair Work. Work required to be corrected, repaired or replaced shall be subject to the warranties of this Contract in the same manner and to the same extent as Work originally delivered under this Contract.
- f. The foregoing warranties shall survive the Owner's inspection, acceptance, use and subsequent dispossession or sale of the Work.

4. LIQUIDATED DAMAGES

- a. **TIME IS OF THE ESSENCE.** Supplier acknowledges that the time for performance of the Work is of the essence of this Agreement, and Supplier agrees to see to the performance of the Work, including the Work performed by Supplier's Sub-Suppliers so that the entire Project may be completed in accordance with the Contract Documents and Exhibit 1 Guaranteed Dates
- b. If Supplier fails to meet the Guaranteed Dates, the parties agree that the Owner would be damaged. As it would be almost impossible to ascertain the actual damages precisely, Supplier agrees to pay Liquidated Damages in the amounts listed herein. Any sums payable under this Article are in the nature of Liquidated Damages and not a penalty. The payment of Liquidated Damages shall be the sole and exclusive remedy for the Owner for the specific performance failure to which the Liquidated Damages applies, except that the Owner shall have the right to terminate the Contract for cause if Supplier reaches the aggregate Liquidated Damages cap defined in 4.c. below.

Requirement	Liquidated Damages
Late Delivery - Equipment	\$300/Day for the first seven (7) Days which the equipment delivery is late, \$600/Day commencing at the end of the seventh Day and continuing until delivery of the Equipment at the Project Site.

- c. Aggregate total for all Liquidated Damages shall be limited to a maximum of 10% of the Contract Price.

5. INSPECTION AND TESTING

- a. The Owner reserves the right to review Supplier’s quality assurance and quality control procedures and to inspect and witness all Supplier’s operations and tests.
- b. Supplier shall notify the Owner at least thirty (30) Days in advance when portions of the Work are ready for inspection or testing in accordance with the Supplier’s inspection and test plan as approved by the Owner.
- c. Failure to inspect and accept or reject the Work shall not relieve the Supplier from responsibility for compliance with the Contract requirements nor impose liability on the Owner. The Owner reserves the right to reject Work that is unsatisfactory, faulty, or defective or does not conform to the requirements of the Contract.
- d. Supplier shall carry out factory tests of the Equipment in accordance with Supplier’s procedures for such tests and in accordance with the Specifications. Owner and its representatives including the Engineer shall have the right to witness such factory tests. Date and time of such tests shall be communicated to Owner no later than thirty (30) Days in advance. Supplier shall bear the cost of such tests, but Owner shall bear the cost for its representative to attend them.

6. PAYMENT

- a. Payments shall be made in accordance with the agreed Milestone Payment Schedule in Exhibit 2.
- b. The Owner may require as a condition of payment that the Supplier submit evidence satisfactory to the Owner that any and all claims of subcontractors, suppliers or other third parties that have performed services or provided supplies in connection with the Work included in any invoice have been paid or satisfactorily secured prior to making any partial payment, including but not limited to a Partial Waiver of Lien and Release of Claims as set forth in Exhibit 3 from Supplier and all Sub-Suppliers for whose work payment is sought waiving any lien rights for the amount requested in the invoice
- c. Payment shall be made within thirty (30) Days following receipt of a properly documented invoice; however, in no case shall payment be due prior to the date indicated in the milestone payment schedule, and in particular, final payment shall be no sooner than the Acceptance Date.
- d. All currency and payments shall be in U.S. dollars.

7. SECURITY FOR PERFORMANCE

Supplier shall furnish security in accordance with the Article 1 of the *Bond and Insurance Supplement*.

8. TAXES

Owner is a municipal corporation exempt from taxation under the laws of the State of Kansas. Taxes payable for the sale, purchase, or use of materials or equipment should not be included in the Bid price. However, any tariff, duty, impost, fee, or any similar assessment or tax imposed by a governmental entity that does not recognize Owner’s sovereign tax exempt status, should be included in the Bid as a separate item in the form of a schedule indicating the name and address of the governmental entity and the specific nature and amount of each such tariff, duty, impost, fee, or any similar assessment or tax thereof..

9. SAFETY AND PROTECTION:

- a. Supplier shall take necessary safety precautions with respect to performance of the Work, shall comply with safety measures initiated by Owner and with applicable laws, ordinances, rules, regulations, and orders of public authorities for the safety of persons or property and with the requirements of the Owner’s operations and safety procedures, and shall submit information to Owner which fulfills the requirements as indicated in the Site Specific Safety and Health Plan. Failure to comply with safety provisions outlined in the Site Specific Safety and Health Plan may result in back charges to Supplier or withholding of payment until safety violations or inadequacies are abated or corrected.
- b. Verbal notification shall immediately be corresponded to Owner of any workplace near miss, incident, accident, injury, illness, death, or related hospitalization of Supplier’s employees or agents at the Site of the Project, and a written report shall be made to Owner within twenty-four (24) hours of the occurrence using the Incident/Accident Investigation Form contained in the Site Specific Safety and Health Plan.
- c. All Supplier employees shall attend Owner’s Project orientation training and any site-specific training required by Owner, prior to the employees being allowed to work on the site. If Owner does not provide Project orientation training, Supplier shall provide such training that meets or exceeds the requirements outlined in the Project Orientation Training Report found in the Site Specific Safety and Health Plan, and the report shall be submitted to Owner. Supplier shall document the subject, date, time, and attendance for these safety meetings, with copies sent to Owner.
- d. Supplier shall be held responsible for its sub-Sub-Suppliers’ compliance with the Site Specific Safety and Health Plan and all applicable rules, laws, regulations and policies, and this Agreement.
- e. The personal protective equipment (PPE) provisions outlined in the Site Specific Safety and Health Plan shall be enforced by Supplier. The following are minimum requirements for all personnel on the Project Site:
 - A. Safety Glasses ANSI Z-87.1
 - B. Safety Toe work boots with leather upper (no tennis shoe styles)
 - C. Hard Hat
 - D. Shirt with 4 inch minimum sleeves
 - E. Long Pants (no shorts)
- f. Supplier shall provide, or cause to be provided, to each worker on the Project Site, the proper safety equipment for the duties being performed by that worker and shall not permit any worker on the Project Site who fails or refuses to use the same. Owner shall have the right, but not the obligation, to order Supplier to remove the worker from the Project Site for failure to comply with safe job procedures/requirements.

- g. Supplier shall defend, indemnify, and hold harmless Owner and CM Agent from, and be responsible for all claims, damages, and the payment of all fines levied to Supplier or Owner or CM Agent related in any way to safety, health, fire, or environmental violations or deficiencies in the planning or execution of the work, caused in whole or in part by the conduct or failure to act by Supplier, Supplier’s employees, or anyone for whom Supplier is responsible or may be liable.
- h. Owner may request and Supplier agrees to the removal from the Project of any Supplier’s or its sub-Sub-Supplier’s personnel, management, supervision, equipment, tools, or craft for noncompliance with the Site Specific Safety and Health Plan or non-correction of hazards. Owner’s request for removal may also apply to any individual who consistently, in the opinion of Owner, exhibits an unsafe behavior attitude. Owner or CM Agent shall not be liable for any damages experienced by Supplier due to removal of Supplier’s or its sub-Sub-Supplier’s personnel, management, supervision, equipment, tools, or craft from the Site.
- i. Owner has the authority and may stop Work in progress when necessary to enforce safety requirements. Owner or CM Agent shall not be liable for any damages experienced by Supplier due to stoppage. No part of the time lost due to any such stop work order shall be made the subject of a claim for extension of time or increased costs by Supplier.
- j. In the event the Project Site, or any portion of the work at the Project Site, is stopped or shut down by Owner or any outside agency, caused in whole or in part due to any act, error, or omission of Supplier or its sub-Sub-Suppliers, including, but not limited to, those activities related to safety or health; Supplier shall be responsible for all impact costs and damages suffered by Owner due to such delay or disruption, in addition to the pass through of liquidated damages (if any) suffered by Owner as may be proportionately assessed to Supplier by Owner.
- k. Supplier shall institute and maintain a substance and alcohol abuse prevention program which meets or exceeds the requirements outlined in the Site Specific Safety and Health Plan.
- l. Supplier, its agents, employees, sub-Sub-Suppliers, and suppliers shall not take cell phones onto the Site without the express written permission of Owner’s authorized representative.

10. TERMINATION

- a. Termination for Cause:
 - i. The Owner may terminate this Contract for cause, in whole or in part, by written notice to Supplier if Supplier: fails to deliver the Goods or to perform the Work within the time specified in this Contract; fails to tender conforming Goods; fails to obtain proper licenses, permits and registrations; fails to obtain and maintain required insurance coverage; fails to make progress so as to endanger timely performance of this Contract; fails to comply with the site safety requirements; violates any applicable laws; or fails to provide adequate assurances of performance.
 - ii. If, after termination, it is determined that Supplier was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the Contract had been terminated for the convenience of the Owner.
 - iii. Upon issuance of a written notice of termination for cause, Supplier shall proceed as required by this paragraph and the Owner shall be entitled to the rights set forth herein. Supplier shall stop all Work hereunder unless otherwise specified in the notice of termination. The Owner shall not be obligated to make any further payments for the Work. If the Owner has revoked acceptance, then such Work shall be treated as having not been accepted. The Owner shall not be required to accept the tender of any Work that

Owner has elected to terminate or cancel. The Owner may take possession of any specialty equipment or specialty tools necessary for completion of the Work. The Owner may complete the performance of this Contract by such means as the Owner selects or may engage any others to complete the performance of this Contract and Supplier shall be responsible for any costs in excess of the Contract value incurred by the Owner in so doing. Any amounts due Supplier for Work completed by Supplier prior to such cancellation shall be subject to offset against such additional costs incurred by the Owner in completing the Work and any other damages incurred by the Owner as a result of Supplier's default.

- b. Termination for Convenience.
 - i. Upon at least three (3) Days written notice to Supplier specifying the extent to which the Contract is terminated, the Owner shall have the right to terminate this Contract or any portion thereof with respect to Goods not yet shipped or Work not yet performed, without liability and in addition to its other rights and remedies, at any time and for any reason.

11. CHANGES

- a. The Owner shall have the right, at any time, to make changes in the Contract that the Owner may deem desirable.
- b. Despite any pending dispute with respect to the Contract, Supplier shall proceed, upon written notice from the Owner with the performance of all Work or changes as directed by the Owner.
- c. If the Owner issues a directive that causes a material increase in Supplier's cost or time for performance, Supplier shall notify the Owner in writing within three (3) Days from the date of Supplier's receipt of the Owner's directive, and subject to such proper notice, an equitable adjustment in the price or time of performance shall be mutually agreed upon between the Owner and Supplier. Agreement to such adjustment shall constitute a waiver of all claims by Supplier arising out of or related to the change.

12. INDEMNIFICATION

- a. Bodily Injury/Property: Supplier agrees to defend, indemnify and hold the Owner and Burns & McDonnell and their respective officers, directors and employees harmless from and against all claims, demands, liabilities, losses, damages, suits, judgments, costs, expenses and reasonable attorney's fees (collectively, "Claims") including those arising, in any manner, out of or resulting from bodily injury, sickness, disease or death of any person or persons, or damage to or destruction of property, including any resulting loss of use arising from breach of Contract or any non-conforming Work, including but not limited to, latent defects or environmental liability, except to the extent that any such Claims are the result of the negligence of the Owner or any of its agents or employees.
- b. Intellectual Property: Supplier agrees to defend, indemnify and hold the Owner and Burns & McDonnell and their respective officers, directors and employees harmless from and against all Claims that the Work, in any manner, gives rise to the infringement of any United States patent, trademark, trade dress, copyright or other intellectual property right.
- c. Worker's Compensation: Supplier, for itself, its successors, assigns, hereby expressly agrees to waive any provision of any workers' compensation act or other similar law whereby Supplier could otherwise preclude its joinder by the Owner or Burns & McDonnell as an additional defendant, or avoid liability for damages, contribution, or indemnity in any action at law, or otherwise where Supplier's or its subcontractor's employee or employees, heirs,

assigns, or anyone otherwise entitled to receive damages by reason of injury or death brings an action at law against the Owner or Burns & McDonnell.

13. PERFORMANCE OBLIGATIONS

- a. When performing Work at the Site, Supplier shall comply with safety measures and procedures required by the Owner and shall comply with all applicable laws, ordinances, rules, regulations and orders of public authorities for the safety of persons or property.
- b. Supplier acknowledges that the technical documents and information provided in the Contract including, without limitation, all drawings and specifications are sufficient for their intended purpose.
- c. No substitution or modification of any Goods or related component parts, materials, or manufacturing locations may be made without prior written consent of the Owner.
- d. Review and approval of shop drawings, samples, design and fabrication drawings, catalog data or other submittals from Supplier is for the purpose of determining general compliance with the Contract only and the Owner is not reviewing such documents to evaluate the means or methods of design or fabrication. Such review shall not transfer any liability to the Owner or others for the proper design, fabrication and installation of the Work and shall not release Supplier of its sole liability for the Work.
- e. All design drawings custom prepared specifically for this Project shall be sealed/stamped by a licensed professional engineer in accordance with the laws of the state where the Project is located. Said sealing/stamping is the responsibility of the Supplier. Drawings of products, materials, and equipment that are of standard structural designs by the manufacturer, fabricator, supplier, or Supplier need not contain the seal/stamp of a licensed professional engineer.

14. INSURANCE

Supplier shall furnish security in accordance with the Article 2 of the *Bond and Insurance Supplement*.

15. OTHER REMEDIES

- a. Setoff/Recoup: The Owner may set off or recoup any amount owed to Owner by Supplier against any amount owed to Supplier by Owner.
- b. Withhold Payment: The Owner may withhold payment to Supplier, in whole or in part, to the extent reasonably necessary to protect the Owner from loss on account of any breach including, without limitation, late delivery of the Goods (including Deliverables) or Work; a violation of the law by Supplier; non-conforming or defective Goods or Work not remedied; claims by a third party or evidence reasonably indicating the probable filing of claims (including, without limitation intellectual property claims, bodily injury claims, property damage claims and subcontractor payment claims); failure of Supplier to make payments to any Sub-Supplier; failure to purchase, at least, the minimum insurance required by this Contract; the supply of counterfeit Goods; any cost for which Supplier is responsible under this Contract; a lien or encumbrance filed against the Project that is not removed; a failure to comply with the site safety requirements; or a breach by Supplier of any warranty of this Contract. When the grounds for withholding payments are removed, payment of such withheld amounts shall be made. No interest shall be due or payable by the Owner on amounts withheld in good faith pursuant to this paragraph.
- c. Backcharge: The Owner may, at its sole discretion, backcharge and invoice to Supplier all costs it incurs arising from or related to Supplier's breach of this Contract including, without

limitation, all costs to correct, repair or replace non-conforming Work not remedied by Supplier; all damage, cost or expense caused by non-conforming Work; all costs associated with lost work time, lost efficiency, idle equipment, additional overhead, and escalation; all costs associated replacing Goods that infringe a third party's intellectual property rights with non-infringing Goods; all costs related to obtaining and maintaining the insurance required by this Contract that the Supplier failed to obtain or maintain; all costs associated with removing any liens filed against the Project or related property; all fines and penalty's assessed that arise out of the Work; and all costs incurred by the Owner arising from a claim that the Work infringes a third party's intellectual property rights.

- d. Late Delivery: If Supplier is unable to meet the required delivery schedules for any reason or if the Owner determines in reasonable judgment that Supplier is not adequately progressing the Work, then if Supplier should fail to offer a plan acceptable to the Owner to recover from such delay within five (5) Days after delivery of written notice from the Owner, the Owner may, at its sole discretion, terminate this Contract for cause; or direct Supplier to accelerate the progress of the Work including, without limitation, extending the work week, working additional shifts or overtime, and/or supplying additional manpower, equipment, facilities and other similar measures. Supplier shall be solely liable for the costs associated with such acceleration.
- e. Intellectual Property Infringement: If any claim for infringement of intellectual property is brought against the Owner arising from the Work, Supplier shall, in order to avoid such claims, actions, or proceedings, promptly obtain a license (without additional cost to the Owner) to the intellectual property right that has been allegedly infringed; substitute at its own expense non-infringing Work; or to modify the manufacture or design of such infringing Work so the Work becomes non-infringing provided that such substitutions or modifications meet all the requirements of this Contract.
- f. Latent Defects: Acceptance of all or part of the Work shall not deprive the Owner of the right to revoke acceptance and return any of the Goods or the right to make a claim for damages because of any non-conforming Work or later-discovered defects.
- g. Properly Insure: If Supplier fails to obtain the insurance required by the Contract or fails to maintain coverage as required by the Contract such failure shall be a material breach and the Owner may, at its sole discretion, terminate the Contract for cause.
- h. Not Exclusive. No remedy conferred upon or reserved to the Owner herein is intended to be exclusive of any other available remedy, but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Contract or existing at law or in equity.

16. FORCE MAJEURE

- a. In case of a force majeure event, the Party rendered wholly or partially unable to perform its obligations under this Contract will be excused from whatever performance is affected by the force majeure event to the extent so affected. The affected Party shall have an obligation to notify in writing the other Party within three (3) Days, and mitigate and work around the force majeure event to the extent commercially practicable. Supplier shall bear all of its own costs in connection with force majeure events it suffers.
- b. The following events shall not be considered force majeure:
 - i. strikes or labor disturbances involving the employees of Supplier or any of its Sub-Suppliers who are not performing Work at the Site (unless national in nature);

- ii. price fluctuations with respect to labor or materials, supplies or components of equipment related to items to be supplied by Supplier;
- iii. mere economic hardship; or
- iv. fluctuations in currency exchange rates.

17. MISCELLANEOUS

- a. Claims: Except where expressly stated otherwise in this Contract, no claim for extra compensation or for additional time for performance of the Work shall be valid unless Supplier shall first have provided written notice of such claim to the Owner within three (3) Days of the start of the event giving rise to the claim. Such notice is a material consideration of this Contract and if Supplier fails to provide the Owner such notice within such time frame, Supplier's claim shall be deemed waived.
- b. Confidentiality: This Contract is confidential between the Owner and the Supplier, and the Supplier agrees that none of the information or details connected therewith shall be published or disclosed to any third party without the Owner's written permission, or otherwise provided by law.
- c. Limitations: In no event, whether based on Contract, indemnity, warranty, tort (including negligence), strict liability or otherwise shall the Owner be liable for consequential, special or indirect damages, including, without limitation, damages or losses in the nature of business interruption, loss of reputation, loss of or increased costs related to third party financing, loss of anticipated profits or anticipated revenue, or cost of capital.
- d. Assignment: Supplier shall not attempt to assign this Contract and any rights or obligations hereunder (by contract, acquisition, merger, operation of law or otherwise) in whole or in part, without the prior written consent of the Owner. Any attempt to assign any rights or obligations hereunder without appropriate consent shall be deemed void.
- e. Severability of Provisions: If any term, condition or provision of this Contract or the application thereof to any Party hereto be invalid or unenforceable at law, the offending word(s), sentence(s) or paragraph(s) shall be considered as stricken from this Contract and the remainder of this Contract, shall not be affected thereby, and each remaining term, condition and provision of this Contract shall be valid and be enforced to the fullest extent permitted by law.
- f. Survival: The obligations of the Parties hereunder which by their nature should survive the termination of this Contract or the completion of the Work hereunder, including, without limitation, those provisions of this Contract which provide for the protection against liability, shall survive and inure to the benefit of the Parties.
- g. Independent Contractor: Supplier is an independent contractor in the performance of the Work specified in this Contract. The Owner retains no control or direction over Supplier, its employees, and Sub-Suppliers or subcontractors or over the detail, manner, or methods of performance of the Work by Supplier, its employees, and sub-suppliers or subcontractors.
- h. Governing Law/Venue: The rights of all Parties hereunder and the construction of every provision hereof shall be governed by the laws of the State of Kansas, without giving effect to principles of conflicts of law. The Parties agree that any action arising out of this agreement or in connection with the Work shall be brought in the federal, state, or local court located in or otherwise having jurisdiction over Montgomery County in the State of Kansas and the parties hereby consent to personal jurisdiction in such courts and waive any objection based on jurisdiction or venue of any such action. Each Party waives its right to a jury trial in any

court action arising among the Parties under this Contract or otherwise related to this Contract, whether made by claim, counterclaim, third party claim or otherwise.

- i. No Waiver: Failure by the Owner to enforce any provision hereof, the Owner's failure or delay in exercising rights or remedies provided herein or by law, the Owner's approval of, acceptance of, or payment for the Work, or any part or combination thereof, shall neither relieve nor release Supplier from any of its obligations under this Contract, shall not be deemed a waiver of any rights of the Owner to insist upon strict performance hereof or of any of the Owner's rights or remedies under this Contract or by law, and shall not operate as a waiver of any of the provisions hereof.
- j. Prior Dealings: No course of prior dealing or performance between the Owner and Supplier or usage of trade shall be relevant to supplement, explain, interpret, or modify any term, condition, or instruction used in this Contract.

EXHIBIT 1 – GUARANTEED DATES

ITEM	No Earlier Than* Delivery Date	No Later Than Delivery Date
Ventilation fans, controls, and wiring	March 1, 2016	March 31, 2016
All associated accessories and spare parts per contract.	March 1, 2016	March 31, 2016

* Supplier may not deliver the Equipment, and Owner will not be obligated to accept delivery of the Equipment before these dates unless prior written approval is provided by Owner or CM Agent.

Supplier agrees to provide Submittal drawings to Owner within ten (10) working days following execution of the Contract, which shall be a condition precedent upon Owner’s ability to approve release of Equipment for production on or before December 1, 2015.

Supplier and Owner agree that the Equipment shall be released for production on or before December 1, 2015 in order to meet the Guaranteed Dates for delivery listed in the above table; provided however, Supplier’s failure, in whole or in part, to provide timely Submittal drawings, responses to Engineer’s comments, revisions to Submittal drawings, or otherwise cause the Owner or Engineer to be unable to approve the Equipment to be released for production shall not constitute an excusable delay to the Guaranteed Dates and Supplier shall pay such Liquidated Damages as required under paragraph 4.d herein.

EXHIBIT 2 – MILESTONE PAYMENT & CANCELLATION SCHEDULE

Upon meeting or successful completion of the set forth dates for required documents, fabrication, delivery, installation and testing performed by the Supplier, the Owner shall pay the Supplier for a percentage of the contract value, less retention in accordance with Article 6 Payment, as follows:

- 5% following execution of the Contract
- 20% following release of Equipment for production
- 50% prior to shipment of Equipment
- 20% following delivery
- 5% following Owner’s acceptance of Closeout documents

The Owner may cancel an order only after written notice to Supplier. Should this Contract be cancelled by Owner due to no fault of the Supplier, the Owner shall pay the Supplier as follows:

Cancellations or changes received thirty (30) Days prior to acknowledged shipping date shall be entered at no charge to Owner. Any change or cancellation of an order less than thirty (30) Days prior to acknowledged shipping date will be subject to charges as agreed to by Supplier and Owner, based on actual costs incurred by Supplier, at the time of notification.



EXHIBIT 3 – PARTIAL WAIVER OF LIEN AND RELEASE OF CLAIMS

To: _____ and others, to the extent others have interests secured by the property of said Owner (the "Project") as identified below.

Supplier's name: _____

The Project: _____

Partial Payment Requested: \$ _____

Supplier, contingent upon the issuance, final clearance and payment of a valuable consideration of \$ _____, which is currently due and payable states that:

1. The payment amount set forth above constitutes payment in full for Supplier’s Work through the date of the last Work covered by the progress payment application for which payment is sought (“Payment Date”) on the Project excepting those claims previously made in writing to Owner and remaining unsettled as of the date of this Partial Waiver of Lien and Release of Claims.
2. Supplier represents that payment has been made to the extent of prior progress payments on the Project to all of the undersigned's sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers in connection with the performance of the Project. Supplier shall make further progress payments to its sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers out of this progress payment.

Partial Waiver and Release of Claims

NOW, THEREFORE, effective as of receipt of the payment referenced in this progress payment application, Supplier releases and waives, upon receipt of the progress payment, all claims for payment through the Payment Date, except those claims previously made in writing to Owner and remaining unsettled at the time of payment including any and all mechanic's lien rights against the Project.

Supplier: _____

By: _____

Title: _____

Date: _____



EXHIBIT 4 – FINAL WAIVER OF LIEN AND RELEASE OF CLAIMS

To: _____, and others, to the extent others have interests secured by the property of said Owner (the "Project") as identified below.

Supplier's name: _____

The Project: _____

Final Payment Requested: \$ _____

Supplier, contingent upon the issuance, final clearance and payment of a valuable consideration of \$ _____, which is currently due and payable states that:

1. The payment amount set forth above constitutes payment in full for Supplier’s work on the Project excepting those claims previously made in writing to Owner and remaining unsettled at the time of final payment.
2. Supplier represents that payment has been made to the extent of prior progress payments on the Project to all of the undersigned's sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers in connection with the performance of the Project. Supplier shall make final payments to its sub-subcontractors, Sub-Suppliers, equipment providers, materialmen and laborers out of this final payment.

Final Waiver and Release of Claims

NOW, THEREFORE, effective as of receipt of the payment referenced in this Application, Supplier releases and waives, upon receipt of final payment, all claims for payment, except those claims previously made in writing to Owner and remaining unsettled at the time of final payment including any and all mechanic's lien rights against the Project.

Supplier: _____

By: _____

Title: _____

Date: _____

Coffeyville Municipal Light & Power
Coffeyville Generation Facility 2
C4440 – Ventilation Fans
Burns & McDonnell Project No. 81799
Burns & McDonnell Engineering Company, Inc.

DOCUMENT 000005 - INDEX AND CERTIFICATION PAGE

SPECIFICATION INDEX

<u>DOCUMENT / DIVISION</u>	<u>DESCRIPTION</u>	<u>NUMBER OF PAGES</u>
23	HEATING, VENTILATING, AND AIR CONDITIONING	12

CERTIFICATION(S)

I hereby certify that this information in the document was assembled under my responsible charge. This report is not intended or represented to be suitable for reuse by others without specific verification or adaptation by the Engineer. This certification is made in accordance with the provisions of the statutes and rules of the Kansas State Board of Licensure for Professional Engineers and Land Surveyors.

Coffeyville Municipal Light & Power
Coffeyville Generation Facility 2
C4440 – Ventilation Fans
Burns & McDonnell Project No. 81799
Burns & McDonnell Engineering Company, Inc.

DOCUMENT 000005 - INDEX AND CERTIFICATION PAGE

SPECIFICATION INDEX

<u>DOCUMENT / DIVISION</u>	<u>DESCRIPTION</u>	<u>NUMBER OF PAGES</u>
26	ELECTRICAL	7

CERTIFICATION(S)

I hereby certify that this information in the document was assembled under my responsible charge. This report is not intended or represented to be suitable for reuse by others without specific verification or adaptation by the Engineer. This certification is made in accordance with the provisions of the statutes and rules of the Kansas State Board of Licensure for Professional Engineers and Land Surveyors.

Attachment B

Technical Specifications & Drawings



ATTACHMENT B
SPECIFICATIONS & DRAWINGS

TABLE OF CONTENTS

<u>Revision</u>	<u>SPECIFICATIONS</u>	<u>Number of Pages</u>
	DIVISION 1 – GENERAL REQUIREMENTS	
0	Section 011100 Summary of Work	5
0	Section 013210 Project Meetings, Schedules & Reports	3
0	Section 013301 Submittals	10
0	Appendix A Submittal Schedule	2
0	Appendix B Submittal Information Block	1
0	Appendix C Submittal Description	1
0	Appendix D Typical Instruction Book Cover or Operating Manual Cover and Spine Layout	1
0	Appendix E Vendor Submittal Reference Document	11
0	Section 016001 Equipment and Materials	3
0	Section 017501 Manufacturer’s Field Services	3
0	Section 017801 Contract Closeout	2
	DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING	
0	Section 237433 Dedicated Outdoor-Air Units	5
0	Section 237434 Duplex Dedicated Outdoor-Air Units	5
0	Section 239433 Data To Be Submitted With Bid – Outdoor-Air Units	2
	DIVISION 26 – ELECTRICAL	
0	Section 260002 Electrical Equipment – General Technical Requirements	3
0	Section 260551 Alternating Current Electric Motors	4



Coffeyville Municipal Light & Power
Ventilation Fans Contract
Specifications & Drawings



CONTRACT DRAWINGS

<u>Drawing No.</u>	<u>Rev</u>	<u>Drawing Title</u>
MH801	1	Power Block Building Auxiliary Side Make-Up Air Unit Details
MH802	1	Power Block Building Generator Side Make-Up Air Unit Details

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes basic identification of the Work covered in detail in the complete Contract.

1.02 PROJECT DESCRIPTION:

- A. The Project is a natural gas fired reciprocating engine power plant designed for 56 MW (nominal) net electric power output.
- B. The Project Site is located at ~~2601 N 5th St, Liberty, Montgomery County, Kansas 673512000 E. Airport Road, Stillwater, Oklahoma 74074.~~
- C. Supplier is responsible for final design including Supplier's Equipment arrangement.

1.03 WORK COVERED BY CONTRACT:

- A. The Contract includes but is not limited to, engineering, designing, fabricating, factory testing, packaging, delivering, assembling, and field testing the following components of Work, which are listed for the Supplier's convenience in understanding the scope of Work:
 - 1. Furnish the following ventilation fans in manufactured housings with all controls, wiring, and accessories described herein.
 - a. MAU-P-1A
 - b. MAU-P-1B
 - c. MAU-P-2A
 - d. MAU-P-2B
 - e. MAU-P-3A
 - f. MAU-P-3B
- B. Equipment will be located outdoors. All Work shall be designed to meet the design data and Site Conditions as defined and stated herein. If located outdoors, Equipment shall meet the Outdoor Extreme Design Temperatures stated herein.
- C. The Supplier shall be responsible for furnishing all material, tools, equipment, labor, supervision, and any other incidental items or services necessary to perform all Work described herein.
- D. Supplier shall arrange and be responsible for transport of the Equipment to the Site for unloading by the installation contractor.

1.04 WORK BY OTHERS:

- A. Installation contractor will be responsible for unloading and setting the Equipment, installing foundations, furnishing all piping connections, and wiring all instruments and powered components. Installation contractor will be responsible for field-calibrating of all instruments and provide initial fills and tests all piping, instruments, and powered connections to the Equipment.

1.05 SPARE PARTS:

- A. Supplier shall include all spare parts and tools required for complete installation and commissioning of all supplied Equipment and Materials.

SECTION 011100 - SUMMARY OF WORK: continued

- B. Supplier shall provide a separately priced list of recommended spare parts for each piece of equipment.

1.06 CODES AND STANDARDS

- A. Design specifications and construction of the Project shall be in accordance with (1) applicable laws, regulations, codes and standards of the Federal Government and State of Kansas, including those set forth below and, (2) applicable local (including county and city) laws, regulations, codes and ordinances, including those set forth below. Publications from the following nationally recognized organizations are applicable to the engineering, design, manufacture, and testing of the Equipment included in the Specifications to the extent referenced in these Specifications. All references to publications are to the latest issue of each together with all latest addenda, amendments, or additions thereto as of the Effective Date. References shall be made in accordance with the abbreviations listed below. In the event that conflicts arise between the codes, standards of practice, specifications or manufacturer recommendations described herein and codes, laws, rules, decrees, regulations, standards, etc., of the locality where the equipment is to be installed, the more stringent code shall apply. Supplier shall provide a written position of any such conflict clarifications to Owner in writing.
- B. Federal Codes:

CAAA	Clean Air Act and Amendments
CFR	Code of Federal Regulations
FERC	Federal Energy Regulatory Commission
NERC	North American Electric Reliability Corporation
Title 29	Code of Federal Regulations (CFR), Part 1910 Occupational Safety and Health Standards.

- C. Industry Codes:

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute 318-08
ACI	Building Code Requirements for Masonry Structures 530-05
AFPA	American Forest and Paper Association
AGA	American Gas Association
AIA	American Institute of Architects
AISC	American Institute for Steel Construction, ASD/LRFD (13th Ed.)
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
API	American Petroleum Institute
ASCE	American Society of Civil Engineers 7-05
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ASNT	American Society of Nondestructive Testing

SECTION 011100 - SUMMARY OF WORK: continued

AWWA	American Water Works Association
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
DIN	German Standard (Deutsche Institute für Normung)
EJMA	Expansion Joint Manufacturer's Association
EN	European Standard
FCI	Fluid Control Institute
HEI	Heat Exchange Institute
HI	Hydraulic Institute
IAPWS	International Association for the Properties of Water and Steam
IBC	International Building Code 2009
IBC	Stillwater Local IRC IBC Amendments Ordinance No 3127
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IES	IES Lighting Handbook
ISA	International Society of Automation
ISO	International Standard Organization
MSS	Manufacturers Standardization Society
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
SMACNA	Sheet Metal and Air Conditioner Contractors National Association
SSPC	Steel Structures Painting Council
TEMA UFC	Thermal Insulation Manufacturers Association
UL	Underwriters Laboratories

D. County / City Codes:

Fire Marshall / AHJ	2009 International Fire Code
Building Code	2009 International Building Code Stillwater Local IRC IBC Amendments Ordinance No 3127

1.07 PROJECT SITE CONDITIONS:

A. The Project Site has the following Site Conditions:

1. Plant elevation is 930-755 feet above mean sea level.
2. Indoor Design Temperatures – Engine Halls, Mechanical Rooms
 - a. Maximum Dry Bulb 120°F
 - b. Minimum Dry Bulb 50°F
3. Outdoor Design Temperatures (2009 ASHRAE)
 - a. Maximum Dry Bulb (1%) 99.297.1°F
 - b. Mean Coincident Wet Bulb (1%) 75.375.8°F
 - c. Minimum Dry Bulb (99.6%) 43.610.3°F
4. Outdoor Extreme Design Temperatures (2009 ASHRAE)
 - a. Maximum Dry Bulb (n = 1 year) 104.2102.8°F
 - b. Minimum Dry Bulb (n = 1 year) 5.40.6°F

SECTION 011100 - SUMMARY OF WORK: continued

- c. Extreme Max Wet Bulb 88.288.9°F
- B. IBC Design Criteria:
 - 1. Occupancy Category: III
 - 2. Wind loads – Section 1609
 - a. Basic wind speed: $V_{3S} = 90$ mph
 - b. Exposure category: C
 - c. Wind Importance Factor: $I_w = 1.15$
 - d. Minimum lateral pressure: $p_s = 10$ psf
 - 3. Seismic loads – Section 1613
 - a. Seismic Site Class: D
 - b. Seismic Importance Factor: $I_E = 1.25$
 - c. Component Importance Factor: $I_p = 1.0$
(per ASCE 7-05 Section 13.1)
 - d. Design Spectral Response Acceleration
 - (1) Short Period: $S_s = 0.193$
 - (2) 1 Second: $S_1 = 0.063$
 - (3) Max. considered short period: $S_{MS} = 0.309$
 - (4) Max. considered 1-second: $S_{M1} = 0.151$
 - (5) 5% damped design short period: $S_{DS} = 0.206$
 - (6) 5% damped design 1-second: $S_{D1} = 0.101$
 - (7) Long-Period Transition Period: $T_L = 12$ seconds
 - e. Seismic Design Category: B
 - 4. Snow loads – Section 1608:
 - a. Snow Importance Factor: $I_S = 1.1$
 - b. Ground snow load: $p_g = 10-15$ psf
 - c. Terrain Category: C
 - 5. Ice Loads
 - a. Ice thickness Importance Factor: $I_i = 1.25$
 - b. Wind Concurrent with ice Importance Factor $I_w = 1.0$
 - c. Nominal Ice Thickness: $t = 0.75-1.0$ "
 - d. Concurrent wind speed $V_C = 40$ mph
- C. Precipitation
 - 1. Minimum Annual: Unknown
 - 2. Average Annual: 37 inches
 - 3. Maximum Annual: Unknown
 - 4. Maximum 25-year 24 Hour Rain: 8 inches
 - 5. Maximum 24 Hour Snow: 13 inches
- D. Prevailing Wind Direction
 - 1. Annual: South

1.08 SITE UTILITIES:

- A. Electrical:

SECTION 011100 - SUMMARY OF WORK: continued

1. AC Power: 480VAC, 3 phase, 60 Hz

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 011100

SECTION 013210 - PROJECT MEETINGS, SCHEDULES, AND REPORTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. Project Meetings:
 - 1. Preliminary Conference.
 - 2. Engineering Coordination Meetings
- B. Schedules and Reports:
 - 1. Initial Coordination Submittals.
 - 2. Work Progress Schedule.
 - 3. Work Progress Reports.
- C. Related SECTIONS:
 - 1. Submittals: SECTION 013301.
 - 2. Equipment and Materials: SECTION 016001.

1.02 PROJECT MEETINGS:

- A. Preliminary Conference:
 - 1. Engineer will conduct a conference call within 10 Days after the Award Date, to review items stated in the agenda and to establish a working understanding between the parties as to their relationships during performance of the Work. The conference shall be attended by:
 - a. Supplier.
 - b. Owner.
 - c. Supplier's principal Sub-Suppliers, at discretion of Engineer.
 - d. Engineer
 - 2. Meeting Agenda:
 - a. Projected fabrication/construction schedules.
 - b. Project coordination.
 - c. Procedures and processing of:
 - d. Substitutions.
 - e. Submittals.
 - f. Change Orders.
 - g. Applications for Payment.
 - h. Procedures for testing.
 - 3. Location of Meeting: Conference Call
 - 4. Reporting: Within five (5) Days after the meeting, Engineer will prepare and distribute minutes of the meeting to each party represented.
- B. Engineering Coordination Meetings:
 - 1. Supplier shall schedule and conduct a conference call at least monthly for coordination during Supplier's equipment engineering and design phase of the Work. Meetings shall be attended by:
 - a. Supplier's representative(s) including engineering personnel.
 - b. Supplier's principal Sub-Suppliers, at Engineer's discretion.
 - c. Owner
 - d. Engineer.

SECTION 013210 - PROJECT MEETINGS, SCHEDULES, AND REPORTS: Continued

2. Meeting Agenda:
 - a. Review of action items.
 - b. Facility design interfaces.
 - c. Equipment and Material procurement status.
 - d. Engineering/fabrication/manufacturing schedules.
 - e. Requests for information (RFIs).
 3. Location of Meetings: Conference Call
 4. Reporting: Within five (5) days after the meeting, Supplier will prepare and distribute minutes of the meetings to each party represented.
- 1.03 SCHEDULES AND REPORTS:
- A. Initial Coordination Submittals: Within the time indicated in SECTION 013301 Appendix A, Supplier shall submit to Engineer:
 1. A preliminary Work progress schedule.
 2. A preliminary schedule of Submittals.
 - B. Work Progress Schedule:
 1. After submittal of preliminary Work progress schedule, submit to Engineer a detailed Work progress schedule and detailed manufacturing schedule for each piece of Equipment within the time indicated in SECTION 013301 Appendix A. Base the schedule on the preliminary Work progress schedule and incorporate review comments and other feedback.
 2. The schedule shall show the Work in a graphic format suitable for displaying scheduled and actual progress.
 - a. Prepare schedules as a horizontal bar chart with separate bar for each major portion of the Work or operation.
 - b. The schedule shall also show the Work broken down into major phases and key items with the dates Work is expected to begin and be completed. Sequence of listings shall be in the chronological order of the start of each item of Work.
 - c. Scale and spacing shall allow space for notations and revisions.
 - d. Sheet size: 8.5 x 11 or 11 x 17 inches.
 3. Provide sub-schedules to define critical portions of entire schedules.
 4. Coordinate Work progress schedule with Work progress reports and delivery schedule.
 5. Engineer will review and comment on Work progress schedule and, upon agreement between Engineer and Supplier on necessary changes:
 - a. Supplier shall print and distribute copies of the accepted schedule to Owner, Engineer, Sub-Suppliers, and other parties required to comply with scheduled dates.
 6. Supplier shall not change the accepted Work progress schedule without prior written concurrence of Engineer.
 7. Submit to Owner an updated schedule at least once a month. Schedule shall show actual progress and any proposed changes in the schedule of remaining Work.
 - C. Work Progress Reports:
 1. Submit monthly a report on actual Work progress. More frequent reports may be required should the Work fall behind the accepted schedule.

SECTION 013210 - PROJECT MEETINGS, SCHEDULES, AND REPORTS: continued

2. Work progress reports shall consist of marked copies of prints made from the accepted Work progress schedule, and a narrative report which shall include but not be limited to the following:
 - a. A description of current and anticipated delaying factors, if any.
 - b. Impact of possible delaying factors.
 - c. Proposed corrective actions.
3. A Work progress report shall accompany each application for partial payment. Work reported complete but not readily apparent to Owner must be substantiated with supporting data.
4. Should operations fall behind accepted schedule to an extent that Supplier's ability to meet the Guaranteed Delivery Dates appears doubtful to Owner, Owner shall so notify Supplier, and Supplier shall, at no change in Contract Price, take corrective action to get back on schedule, and submit an updated Work progress report to Owner.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 013210

SECTION 013301 - SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes definitions, descriptions, transmittal, and review of Submittals.
- B. Related SECTIONS:
 - 1. Contract Closeout: SECTION 017801.

1.02 GENERAL INFORMATION:

- A. Definitions:
 - 1. Shop Drawings, Product Data, and Samples are technical Submittals are defined below and are prepared by manufacturer or Supplier and submitted by Supplier to Engineer as a basis for review and approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each DIVISION of the Specifications.
 - a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
 - b. Product Data includes standard printed information on materials, Products, and systems; not custom-prepared for this Contract, other than the designation of selections from available choices.
 - c. Samples include both fabricated and unfabricated physical examples of Materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or for more detailed testing and analysis. Mockups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
 - 2. Informational Submittals are those technical reports, administrative Submittals, certificates and guarantees not defined as Shop Drawings, product data, or Samples.
 - a. Technical reports include laboratory reports, tests, technical procedures, technical records, and Supplier's design analysis.
 - b. Administrative Submittals are those nontechnical Submittals required by the Contract or deemed necessary for administrative records. These Submittals include maintenance agreements, bonds, photographs, physical work records, statements of applicability, copies of industry standards, Contract record data, schedules, security/protection/safety data, and similar type Submittals.
 - c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
 - 3. Refer to ARTICLES 1.03 and 1.04 of this PART for detailed lists of documents and specific requirements.
- B. Quality Requirements:
 - 1. Shop Drawings and Product Data shall be submitted in electronic format. Every line, character, and letter shall be clearly legible and of suitable quality for reproduction.

SECTION 013301 - SUBMITTALS: continued

2. Documents submitted to Owner and Engineer that do not conform to specified requirements shall be subject to rejection by Owner and Engineer, and upon request, Supplier shall resubmit conforming documents. Documents rejected due to illegibility or failure to comply with non-technical requirements will not satisfy schedule requirements. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Supplier's failure to initially satisfy the legibility quality requirements will not relieve Supplier from meeting the required schedule for Submittals.
 3. Supplier shall be notified of any Submittals rejected prior to review for legibility or formatting reasons by Engineer or Owner. No notification will be provided for Submittals which are not rejected.
- C. Language and Dimensions:
1. All words and dimensional units shall be in the English language.
 2. Metric dimensional unit equivalents may be stated in addition to the English units. However, English units of measurement shall prevail.
- D. Submittal Completeness:
1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.
 2. Where standard drawings are furnished which cover a number of variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks or X-outs to clearly indicate variations, optional equipment, or other items which do not apply to the Submittal and circle or box all selected variations, optional equipment, or other applicable selections. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Such annotation shall also include proper identification of the Submittal permanently attached to the drawing.
 3. Reproduction or copies of Contract drawings or portions thereof will not be accepted as complete fabrication or erection drawings, but will be acceptable when used by Supplier as a drawing upon which to indicate information on erection or to identify detail drawing references. Whenever the Contract drawings are revised to show that additional Supplier's information, Engineer's title block shall be replaced with Supplier's title block, and Engineer's professional seal shall be removed from the drawing.
- E. Form of Submittals:
1. Supplier shall have one contact person for submitting and retrieving documents.
 - a. This person will be responsible for making sure all documents are submitted properly.
 - b. This person will be receiving an email every week stating what needs to be resubmitted.
 - (1) All submittals with an action status of "B", "C", or "D" need to be resubmitted as described herein.
 2. Submittal Documents
 - a. Name of file must include:
 - (1) Specifications SECTION number in front of filename

SECTION 013301 - SUBMITTALS: continued

- (2) Must be short and specific to the file
 - b. Name of file must NOT include:
 - (1) Revision number/letter
 - (2) Date
 - (3) The word "Submittal"
 - c. All documents that are supplied by the Supplier must be .PDF formatted
 - d. A Submittal Block will be provided to Supplier as a .JPEG file.
 - e. The submittal block must be included on:
 - (1) Each individual PDF drawing. (one drawing per PDF file)
 - (2) The first page of each document that is NOT a drawing.
 - f. When submitting:
 - (1) See Appendix E for submittal instructions on the Webtools site.
 - (2) Send a transmittal letter by email to: 75644@burnsmcd.com, with cc: dpetersen@burnsmcd.com and msarceda@burnsmcd.com.
 - (3) On the transmittal letter:
 - 1) Include a description for each file
 - 2) State what revision the file is.
 - (4) State the project number (81799), project description, Contract number CXXXX (where 'XXXX' is to be replaced by the actual 4 digit number), and the number indicating the submittal number (1, 2, 3, etc.) within the e-mail
 - g. Return Submittal:
 - (1) Make sure the file name has stayed exactly the same as when you first submitted it.
 - (2) Pick up any of Engineer's comments and make the necessary changes to the original document/drawing.
 - (3) If you are making a change or verifying information on any document, provide comment clouding on these items.
 - (4) If the Engineer has made comments and you need to add or delete pages from your original document:
 - (a) Place an "X" through the page to delete it
 - (b) Add additional pages to the end of the PDF.
- 3. Document Pick-Up
 - a. Supplier will receive an e-mail stating that your package is ready to be picked up.
 - b. Click on the Webtools link.
 - c. Download the package.
 - (1) Included in the package are:
 - (a) A return transmittal letter listing the document being returned and what action status they are given.
 - (b) Documents that are being returned with the submittal block filled out.
 - d. Pick-up or respond to all comments from the Engineer.
 - e. Resubmit any required documents as described above. Cloud all changes and increase the revision for all resubmitted documents.

1.03 TECHNICAL SUBMITTALS:

- A. Provide required Submittals as specified in Appendix A and in the Specifications. Additional information about Submittals listed in Appendix A is provided in Appendix C. All durations are Days.
- B. Schedule of Submittals:

SECTION 013301 - SUBMITTALS: continued

1. Prepare for Engineer's concurrence a schedule for submission of all Submittals specified or necessary for Engineer's approval of the use of Equipment and Materials proposed for incorporation in the Work or needed for proper installation, operation, or maintenance. Submit the schedule with the Work progress schedule. Schedule submission of all Submittals to permit review, fabrication, and delivery in time to not cause delay in the Work of Supplier or its Sub-Suppliers or any other contractors as described herein.
 2. In establishing schedule for Submittals, allow 14 Days in Engineer's office for reviewing original submittals and 14 Days in Engineer's office for reviewing resubmittals. For submittals exceeding 20 drawings, Engineer and Owner may request additional time for review within 2 days of submittal receipt.
 3. Submittals requiring revision shall be resubmitted within 14 Days after receipt of Engineer's review notations.
 4. The schedule shall indicate the anticipated dates of original submission for each item and Engineer's approval thereof, and shall be based upon at least one resubmission of each item.
 5. Schedule all Submittals required for submission within the time specified for each in Appendix A.
 6. Resubmit Submittals the number of times required for Engineer's action stamp to read either A, F, or G as described below. However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining approval of Submittals, will not be grounds for extension of the Contract Time provided Engineer completes its reviews within the times specified. Supplier shall not commence production of any part of the Equipment and Materials affected thereby until such Submittal has been reviewed and approved by Engineer.
- C. Transmittal of Submittals:
1. All Submittals (shop drawings, product data, and samples) for Equipment and Materials furnished by manufacturers and Supplier shall be submitted to Engineer by Supplier.
 2. Transmit all Submittals to Engineer for approval as follows:
 - a. Include Submittal Information Block:
 - (1) Electronic files of Submittal Information Blocks will be provided to Supplier for use on electronic Submittals.
 - (2) An example of the Submittal Information Block is included as Appendix B to this Section.
 - b. Mark each Submittal by Project name and number, Contract title and number, and the applicable Specifications SECTION and Article numbers.
 - c. Check and include Supplier's approval for Submittals of Supplier and manufacturers prior to transmitting them to Engineer. Supplier's approval shall constitute a representation to Owner and Engineer that Supplier has determined and verified all design criteria, quantities, dimensions, materials, catalog numbers, compliance with applicable laws and regulations, and similar data, or Supplier assumes full responsibility for doing so, and that Supplier has coordinated each Submittal with the requirements of the Work and the Contract.

SECTION 013301 - SUBMITTALS: continued

- d. At the time of each submission, call to the attention of Engineer in the transmittal letter any deviations from the requirements of the Contract.
 - e. Make all modifications noted or indicated by Engineer and return revised Submittals until approved. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by Engineer on previous Submittals. Previously approved Submittals transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.
 - f. Resubmitted files shall be indicated on the transmittal letter by a later date and revision number than the previous submissions.
 - g. Following completion of the Work and prior to final payment, furnish record documents and approved Samples and Shop Drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. Furnish additional copies for insertion in Equipment instruction books and operating manuals as required. All such copies shall be clearly marked "PROJECT RECORD."
 - (1) Submit a final record copy of a master field drawing list which shall indicate the final revision status of each drawing on the list.
3. Quantity Requirements:
- a. Except as otherwise specified in Appendix A, transmit all Shop Drawings in the following quantities:
 - (1) Initial Submittal:
 - (a) Per Appendix A, this Section.
 - (2) Resubmittals:
 - (a) Per Appendix A, this Section.
 - (3) Submittal for final distribution:
 - (a) Paper - One copy to Owner, One copy to Engineer.
 - (b) Electronic - One CD-ROM or flash drive copy to Engineer in native format. Drawings shall be provided as AutoCAD 2012 or later files.
 - (4) As-constructed documents:
 - (a) Paper - One copy to Owner, one copy to Engineer.
 - (b) Electronic - Three CD-ROM or flash drive copies to Engineer in native format. Drawings shall be provided as AutoCAD 2012 or later files.
 - b. Transmit Submittals of product data as indicated for Shop Drawings above.
 - c. Transmit Submittals of Material Samples, color charts, and similar items as follows:
 - (1) Initial Submittal – Two to Engineer. One to Owner.
 - (2) Resubmittal – Two to Engineer. One to Owner.

SECTION 013301 - SUBMITTALS: continued

- (3) Upon approval, Sample(s) will not be returned to Supplier.
 - d. Except as otherwise specified in Appendix A, transmit Submittals of Equipment instruction books and operating manuals as follows:
 - (1) Initial Submittal:
 - (a) Paper - No copies to Engineer. One copy to Owner. Only Engineer's comments will be returned to Supplier.
 - (b) Electronic - One copy to Engineer. One copy to Owner.
 - (2) Resubmittals:
 - (a) Paper - No copies to Engineer. One copy to Owner. Only Engineer's comments will be returned to Supplier.
 - (b) Electronic - One copy to Engineer. One copy to Owner.
 - (3) Submittal for Final Distribution:
 - (a) Four paper copies to Owner upon Engineer's written authorization.
 - (b) One CD-ROM or flash drive copy to Engineer as PDF files and Two CD-ROM or flash drive copies to Owner.
 - e. All Submittals provided in PDF format shall contain searchable text.
 - f. When all Submittals have been updated to "as-constructed" conditions, transmit to Engineer three copies and Owner five copies each of manuals on CD-ROM.
 - g. Owner may copy and use for internal operations and staff training purposes any and all document Submittals required by this Contract and approved for final distribution, whether or not such documents are copyrighted, at no additional cost to Owner. If permission to copy any such Submittal for the purposes stated is withheld from Owner by manufacturer or Supplier, the Supplier shall provide to Owner 50 copies plus the number of copies required by Supplier at each final distribution issue.
 4. Supplier's erection drawings and other Submittals required for installation of Equipment furnished under this Contract for installation under other contracts will be transmitted electronically to installing contractor by Engineer in the final distribution of such Submittals.
 5. Information to Manufacturer's District Office: Supplier shall arrange for manufacturers and suppliers of Equipment or Materials to furnish copies of all agreements, drawings, specifications, operating instructions, correspondence, and other matters associated with this Contract to the manufacturer's district office servicing Owner. Insofar as practicable, all business matters relative to Equipment and Materials included in this Contract shall be conducted through such local district offices.

D. Engineer's Review:

 1. Engineer will review and take appropriate action on Submittals in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if items of Equipment and Materials covered by the Submittals are compatible with the design concept and conform to information given in the Contract.

SECTION 013301 - SUBMITTALS: continued

2. Such review and approval will not extend to design data reflected in Submittals which is peculiarly within the special expertise of Supplier. Review and approval of a component item as such will not indicate approval of the assembly in which the item functions.
 3. Engineer's review and approval of Shop Drawings, product data, or Samples will not relieve Supplier of responsibility for any deviation from requirements of the Contract Documents unless Supplier has in writing called Engineer's attention to such deviation at the time of submission, and Engineer has given written concurrence in and approval of the specific deviation. Approval by Engineer shall not relieve Supplier from responsibility for errors or omissions in Submittals.
- E. Submittal Action Stamp:
1. Engineer's review action stamp, appropriately completed, will appear on all Submittals of Supplier when returned by Engineer. Review status designations listed on Engineer's action stamp are defined as follows:

A - SUBMITTAL APPROVED Signifies Equipment or Material represented by the Submittal conforms to the design concept and complies with the intent of the Contract and is approved for incorporation in the Work. Supplier is to proceed with fabrication or procurement of the items and with related Work. Copies of the Submittal are to be transmitted to Engineer for final distribution.

B - SUBMITTAL APPROVED AS NOTED (RESUBMIT) Signifies Equipment or Material represented by the Submittal conforms to the design concept and complies with the intent of the Contract and is approved for incorporation in the Work in accordance with Engineer's notations. Supplier is to proceed with fabrication or procurement of the items and with related Work in accordance with Engineer's notations and is to submit a revised Submittal responsive to notations marked on the returned Submittal or written in the letter of transmittal.

C - SUBMITTAL RETURNED FOR REVISION (RESUBMIT) Signifies Equipment or Material represented by the Submittal appears to conform with the design concept and comply with the intent of the Contract but information is either insufficient in detail or contains discrepancies which prevent Engineer from completing its review. Supplier is to resubmit revised information responsive to Engineer's annotations on the returned Submittal or written in the letter of transmittal. Fabrication or procurement of items represented by the Submittal and related Work is not to proceed until the Submittal is approved.

D - SUBMITTAL NOT APPROVED (SUBMIT ANEW) Signifies Equipment or Material represented by the Submittal does not conform to the design concept or comply with the intent of the Contract and is disapproved for use in the Work. Supplier is to provide Submittals responsive to the Contract.

E - PRELIMINARY SUBMITTAL Signifies Submittals of such preliminary nature that a determination of conformance with the design concept or compliance with the intent of the Contract must be deferred until additional information is furnished. Supplier is to submit such additional information to permit layout and related activities to proceed.

SECTION 013301 - SUBMITTALS: continued

F - FOR REFERENCE, NO APPROVAL REQUIRED Signifies Submittals which are for supplementary information only; pamphlets, general information sheets, catalog cuts, standard sheets, bulletins and similar data, all of which are useful to Engineer or Owner in design, operation, or maintenance, but which by their nature do not constitute a basis for determining that items represented thereby conform with the design concept or comply with the intent of the Contract. Engineer reviews such Submittals for general content but not for basic details.

G - DISTRIBUTION COPY (PREVIOUSLY APPROVED) Signifies Submittals which have been previously approved and are being distributed to Supplier, Owner, and others for coordination and construction purposes.

F. Instruction Books and Operating Manuals:

1. In addition to electronic Submittals specified above, Equipment instruction books and operating manuals prepared by the manufacturer shall include the following:
 - a. Index and tabs.
 - b. Instructions for installation, start-up, operation, inspection, maintenance, parts lists and recommended spare parts, and data sheets showing model numbers.
 - c. Applicable drawings.
 - d. Warranties and guarantees.
 - e. Name and address of nearest manufacturer-authorized service facility.
 - f. All additional data specified.
2. Each hard copy of the manuals shall be assembled and bound in black three-ring binders designed for rough usage. Binders shall be as specified below.
 - a. Front covers and spine of the manuals shall be permanently marked with white lettering indicating Owner's name, plant name, unit number, name of equipment, volume number if applicable, contract number, name of Supplier, Supplier's address, and year of manufacture. See Appendix D of this SECTION for more details.

Manufacturer	ViaTech Publishing Solutions or approved equal 424 North Cedarbrook Avenue Springfield, Missouri 65802 1-800-888-0823
Binder type	Swing Hinge C78 Split Prong
Construction	Stiff binder board
Covering	Supported vinyl skytogen liner
Material and color	Black imitation leather (Material Code NV899)
Font	News Gothic Condensed
Imprinting	Foil stamp in accordance with Appendix D of this section. Imprinting color is to be white.

SECTION 013301 - SUBMITTALS: continued

Capacities available Split prong swing hinge 2 inch or 3 inch as required.

- b. Binder capacities shall not exceed 3 inches, nor shall material included exceed the designed binder capacity. If material to be bound exceeds capacity rating, multiple volumes shall be furnished. Binder capacity should not be more than approximately ½- inch greater than the thickness of the material within the binder.
- c. Submit mockup of cover and spine for Engineer's review.

G. Samples:

- 1. Office Samples shall be of sufficient size and quantity to clearly illustrate the following:
 - a. Functional characteristics of the product, with integrally related parts and attachment devices.
 - b. Full range of color, texture, and pattern.
 - c. Material, manufacturer, pertinent catalog number, and intended use.

1.04 INFORMATIONAL SUBMITTALS:

A. Informational Submittals are comprised of technical reports, administrative Submittals, and guarantees which relate to the Work, but do not require Engineer approval prior to proceeding with the Work. Informational Submittals include:

- 1. Test reports.
- 2. Certification on Materials:
 - a. Steel mill tests.
- 3. Shipping and/or packing lists.
- 4. Job progress schedules.
- 5. Equipment and Material delivery schedules.
- 6. Warranties and guarantees.
- 7. Welder qualification records.
- 8. Welding procedures qualification tests.
- 9. X-ray and radiograph reports.
- 10. Hydrostatic testing.

B. Transmittal of Informational Submittals:

- 1. All informational Submittals furnished by manufacturers and suppliers shall be submitted to Engineer by Supplier unless otherwise specified.
 - a. Identify each informational Submittal by Project name and number, Contract title and number, and the Specifications SECTION and Article numbers marked thereon or in the letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
 - b. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from the requirements of the Contract.

SECTION 013301 - SUBMITTALS: continued

2. Quantity Requirements:
 - a. Technical reports and administrative Submittals except as otherwise specified:
 - (1) Paper: One copy each to Engineer and Owner.
 - (2) Electronic: One copy each to Engineer and Owner.
 3. Test Reports:
 - a. Responsibilities of Supplier, Owner, and Engineer regarding tests and inspections of Equipment, Materials, and completed Work are set forth elsewhere in this Contract.
 - b. The party specified responsible for testing or inspection shall in each case, unless otherwise specified, arrange for the testing laboratory or reporting agency to distribute one electronic copy of the test reports to Owner, Engineer, and Supplier.
- C. Engineer's Review:
1. Engineer will review informational Submittals for indications of Work or Material deficiencies.
 2. Engineer will respond to Supplier on those informational Submittals which indicate Work or Material deficiency.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 013301

**APPENDIX A
SUBMITTAL SCHEDULE**

LEGEND: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order

ID	Description	Subj. To LD's	With Proposal (for bid evaluation and award)	For Approval (required prior to fabrication)	For Information / Certification / Construction (conformed including Owner's and Engineer's comments)
1	Notice of Shipment				E – 30 days prior to shipment
2	Recommended Installation & Commissioning Spare Parts		E		
3	Recommended Two-Year Maintenance Spare Parts		E		
4	Preliminary Manufacturing Schedule for each piece of equipment				E – 10 days ARO
5	Schedule of Submittals		E	E – 7 days ARO	
6	Detailed Manufacturing Schedule with milestones				E – 10 days ARO
7	Detailed drawing list with submittal dates				E – 30 days ARO
8	Detailed Work Progress Schedule			E – 14 days ARO	
9	Installation Manuals (include a list of items proposed to be shipped loose)			E – 60 days prior to Contract Delivery Date	P (4), E – 30 days prior to Contract Delivery Date
10	Operating Manuals			E – 60 days prior to Contract Delivery Date	P (4), E – 30 days prior to Contract Delivery Date
11	Packing Lists		E		P (1) – With each shipment
12	Bills of Materials			E – 60 days ARO	
13	Unloading, Handling & Storage Requirements and Procedures				P (1), E – With Notice of Shipment
14	Material Safety Data Sheets (if applicable)				P (4), E – With Notice of Shipment and with each Shipment
15	General Arrangement and Outline Drawings with Dimensions, Weights, Fluid Quantity, materials of construction, recommended maintenance clearances, surface preparation and painting information		E	E – 14 days ARO	E – 30 days ARO
16	Anchor bolt size and arrangement			E – 14 days ARO	E – 30 days ARO
17	Nameplate Drawing				E – 30 days ARO
18	Electrical Schematic			E – 14 days ARO	E – 30 days ARO
19	Interconnection Wiring Diagrams			E – 14 days ARO	E – 30 days ARO
20	Control Panel Front View & Internal Wiring Diagram			E – 14 days ARO	E – 30 days ARO

**APPENDIX A
SUBMITTAL SCHEDULE**

LEGEND: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order

ID	Description	Subj. To LD's	With Proposal (for bid evaluation and award)	For Approval (required prior to fabrication)	For Information / Certification / Construction (conformed including Owner's and Engineer's comments)
21	System I/O List		E	E – 14 days ARO	E – 30 days ARO
22	Control Logic Diagrams and Interface details for Owner's PLC		E	E – 30 days ARO	E – 30 days ARO
23	All Other Drawings				E – 30 days ARO

APPENDIX B
SUBMITTAL INFORMATION BLOCK

Supplier to fill in all blanks
without preprinted information

For the use of Engineer

<p>Project Supplier Identification</p> <p>Supplier: _____</p> <p>Project Name: _____</p> <p>Project No.: _____</p> <p>Contract Title: _____</p> <p>Contract No.: _____</p> <p>Spec. Section No.: _____</p> <p>Supplier's Approval: Submission of this document shall represent contractor's approval as specified in the Contract. Supplier remains liable for accuracy of Submittals as provided in the Contract.</p>	<p>Date Engineer Received</p> <hr/> <p style="text-align: center;">Engineer's Action (See Contract Documents)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Initials & Date</td> <td style="width: 50%;">Initials & Date</td> </tr> <tr> <td>A _____</td> <td>E _____</td> </tr> <tr> <td>B _____</td> <td>F _____</td> </tr> <tr> <td>C _____</td> <td>G _____</td> </tr> <tr> <td>D _____</td> <td></td> </tr> </table>	Initials & Date	Initials & Date	A _____	E _____	B _____	F _____	C _____	G _____	D _____	
Initials & Date	Initials & Date										
A _____	E _____										
B _____	F _____										
C _____	G _____										
D _____											

1. Use this decal on all shop drawings, whether prepared by Supplier or Sub-Supplier. Place as near as possible to the drawing title in the lower right corner.
2. Affix the gummed edge paper information blocks to all "product data" type Submittals immediately inside the front cover.

APPENDIX C

SUBMITTAL DESCRIPTION

System I/O list

- Tabulation of all inputs and outputs associated with a PLC or DCS to be used to control the supplied system.

Electrical Schematic

- Detailed schematics showing each and every light, switch, controller, relay, timer, etc., associated with a systems control circuit
- All voltage and current ratings
- Special wiring requirements (coax, high temp., etc.)

Control Panel Front View & Internal Wiring Diagram

- Physical diagrams of all supplied control panels (internal and external)
- All light and switches including color
- All wiring internal to the panel
- All Tagging/Labeling
- Panel NEMA rating

Electrical Load List

- Tabulation of all motors (load in hp)
- Tabulation of all variable speed drives (load in kW)
- Tabulation of all 120V vital ac loads (load in kW)
- Tabulation including hp, voltage, and number of phases

Electrical Equipment Layout

- Physical drawing showing the location of each of the electrical interface points and elevation of equipment in respect to the plant elevation
- Location of each device that requires Owner's cable to be run to it

Equipment Installation Details

- Drawings showing how to install all devices that require field installation
- Details including support/mounting devices
- Instrument installation details including tubing installation from root valve to the instrument including tubing size, slope, valve manifold, etc.

Interconnection Wiring Diagrams

- Overall system diagram showing 100% of the field wiring required
- Interface of each device or panel being supplied in the system
- Voltage and current ratings

Control Logic Diagrams

- Normal start/stop sequence
- Alarm development
- Identification of all time delays
- Auto stop/start sequence
- Identification of digital control
- Identification of analog control

P&ID's

- System diagrams of all system piping
- Identification of all instruments, pressure switches, limit switches, temperature elements, etc.
- Identification of interface (PLC, DCS, or hard wired interlocks) for each device
- Identification of valves, pumps, etc.
- Identification of all pipe size, materials, and schedule

General Arrangement Drawings

- Dimension and location (plan and elevation) of all equipment including locating dimensions in respect to the plant columns and elevation of equipment in respect to the plant elevation
- Identification of all pull space requirements
- Identification of all access/maintenance requirements

Foundation Details

- Foundation details/outlines depicting overall dimensions, pad and blockout requirements, anchor bolt locations and details, and any

additional information necessary to establish the foundation arrangement

- Either actual or "not-to-exceed" foundation design loads, and their points of application, for all applicable load cases and/or combinations (i.e., dead load, live load, wind, seismic, dynamic, etc.)
- Identification of loading directions, magnitudes, and any other permanent data required for the foundation design

Structural and Miscellaneous Steel

- Certified shop drawings and erection diagrams for all structural steel and miscellaneous steel
- Documents prepared in accordance with the AISC specification for the design, fabrication, and erection of structural steel for buildings

Outline Drawings

- Outline dimensional drawing
- Location of all interface connections (plan and elevation)
- Recommended/required mounting details clearly depicting bolting location, size, material, and projection requirements, or sufficient data such that the Engineer can establish such requirements (for dynamic equipment or machinery data include operating speeds, rotating masses, centers-of-gravity, eccentricities, etc.)
- Weight and center of gravity
- Type of interface connection (e.g., 150 lb. RF flange, welded, weld end preparation, wall thickness or schedule, etc.)
- Allowable loads for all nozzles
- Removal space/maintenance requirements
- Special rigging requirements
- Thermal movements of all nozzles (if applicable)

Piping Information

- Physical drawing showing the routing of all vendor supplied pipe
- Location of pumps, valves, traps, strainers, instrument connections, etc. on the piping drawing
- Location of all Owner/Vendor interface points (plan and elevation) for large and small pipe
- Drawing including locating dimensions in respect to the plant columns and elevation or centerline of equipment
- Allowable loads and movements for all interface points
- Support locations and details
- Identification of pipe sizes, materials, valves, pumps, insulation, etc.
- Field weld locations
- Wall/floor penetration requirements
- Pipe movements in excess of 1 inch
- Design/service conditions (temperature/pressure)

O & M Manuals

- Description of equipment
- Theory of operation
- Troubleshooting
- Equipment drawings
- Installation instructions
- Maintenance instructions
- Sub-supplier component list

APPENDIX D

TYPICAL INSTRUCTION BOOK COVER

<p>NAME OF EQUIPMENT</p>	<p>Owner's Name</p>	<p>Owner's Name 36</p>
<p>Owner's Name</p>	<p>Owner's Facility or Plant Name</p>	<p>Owner's Facility or Plant Name 24</p>
<p>Owner's Facility Name</p>	<p>INSTRUCTION BOOK</p>	<p>INSTRUCTION BOOK 36</p>
<p>CONTRACT NUMBER XXXX</p>	<p>FOR</p>	<p>FOR 36</p>
<p>VOLUME NUMBER*</p>	<p>NAME OF EQUIPMENT</p>	<p>NAME OF EQUIPMENT 36</p>
	<p>VOLUME NUMBER*</p>	<p>VOLUME NUMBER* 36</p>
	<p>CONTRACT NUMBER XXXX</p>	<p>CONTRACT NUMBER XXXX 24</p>
	<p>SUPPLIER'S NAME</p>	<p>SUPPLIER'S NAME 24</p>
	<p>SUPPLIER'S ADDRESS</p>	<p>SUPPLIER'S ADDRESS 24</p>
	<p>SUPPLIER'S ORDER NUMBER</p>	<p>SUPPLIER'S ORDER NUMBER 24</p>
	<p>Equipment Tag Number(s)</p>	<p>Equipment Tag Number(s) 24</p>
(Spine)	(Cover)	

NOTES:

1. All lettering shall be a block style font such as Arial.
2. All spine lettering shall be 14 point.
3. Cover lettering shall be point sizes indicated in column to right of cover illustration.
4. *Volume number required only if instructions are contained in more than one volume

Appendix E

Vendor Submittal Reference Document



Overview:

The following procedure is for vendors, suppliers, or contractors who will be issuing submittals to Burns & McDonnell (BMcD). If you have questions about uploading submittals, please email or call your BMcD contact.

It is a step by step guide on:

- Login options
 - Logging in
 - Resetting the Password
 - Forgotten Passwords
- Preparing and Delivering a Submittal
 - Creating a Submittal
 - Notification of Receipt
- Picking up a Reviewed or Rejected Submittal
 - Notification of Completed/Rejected Documents
 - Download of Completed/Rejected Documents

Appendix E

Vendor Submittal Reference Document



Logging In:

Log into BMcD WebTools at <http://webtools.burnsmcd.com> using the username and password sent to you by Burns and McDonnell's IT support group.

Note: Accounts are user specific. Do not share the username and password. Others who wish to access the system should request a separate account.

Previously you were not able to change the password you received, but now it can be reset after using the initial password from BMcD. After changing the password it cannot be changed again for 24 hours. Previously used passwords cannot be used again. The Domain is BMCDEXT and should preface your username.

To Login:

The Domain is BMCDEXTand should be typed in before the user name. **Example: BMCdext\[user ID]** so the information would be **BMcDEXT\ext_jdoe**.

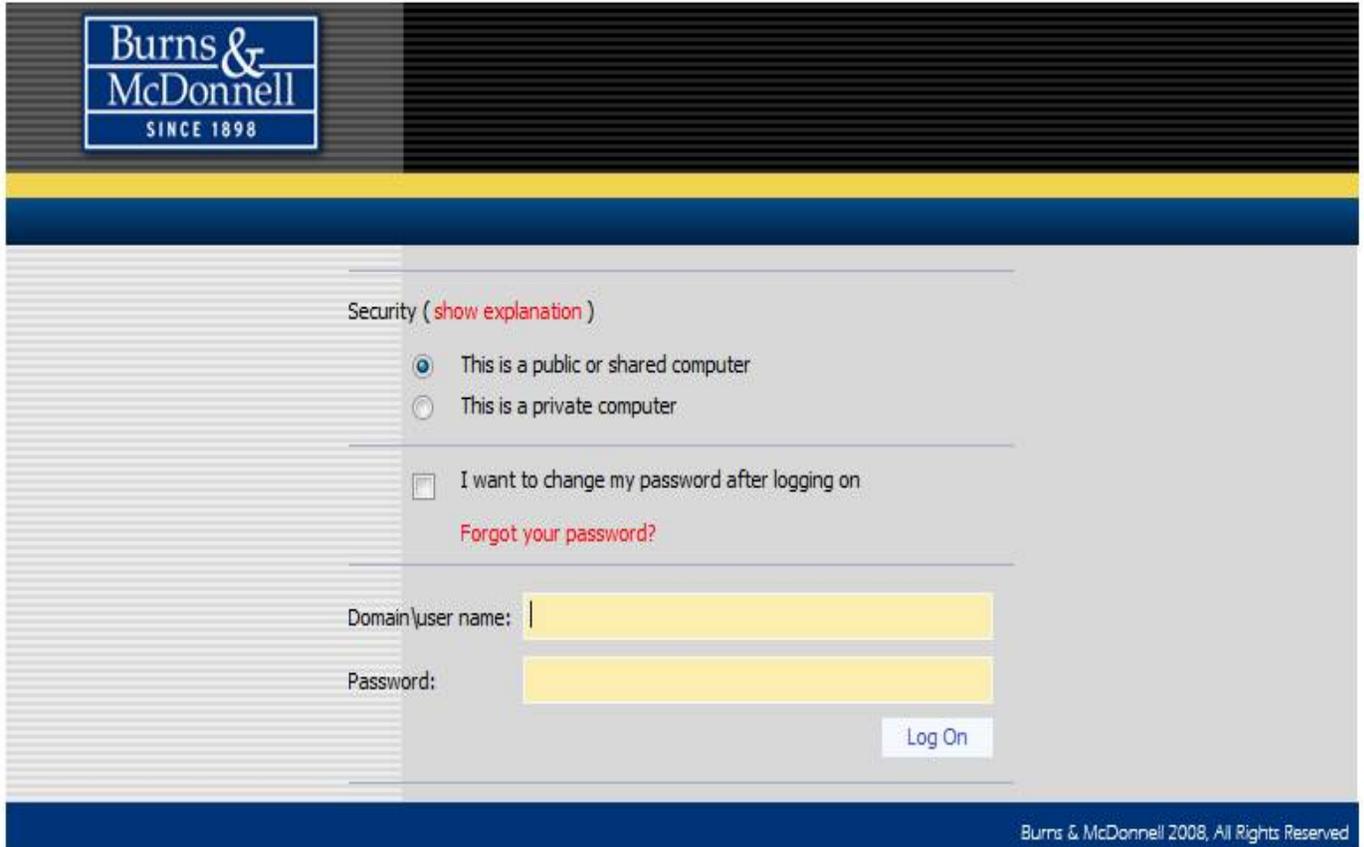
- a. You may change your password by checking the box for I want to change my password after logging on.
- b. If you forgot your password you can have a new password sent to you by clicking the "Forgot your password?"

Appendix E

Vendor Submittal Reference Document



Login Screen:



Burns & McDonnell
SINCE 1898

Security ([show explanation](#))

This is a public or shared computer

This is a private computer

I want to change my password after logging on

[Forgot your password?](#)

Domain\user name:

Password:

Log On

Burns & McDonnell 2008, All Rights Reserved

Appendix E Vendor Submittal Reference Document



Set New Password screen:

Old password:

New password:

Confirm new password:

Burns & McDonnell 2008, All Rights Reserved

- The new password must meet BMcD password requirements:
- The password has to be at least eight characters long.
- The password must contain characters from at least three of the following categories:
 - English uppercase characters (A - Z)
 - English lowercase characters (a - z)
 - Base 10 digits (0 - 9)
 - Non-alphanumeric (For example: !, \$, #, or %)
 - The password cannot contain three or more characters from the user's account name.

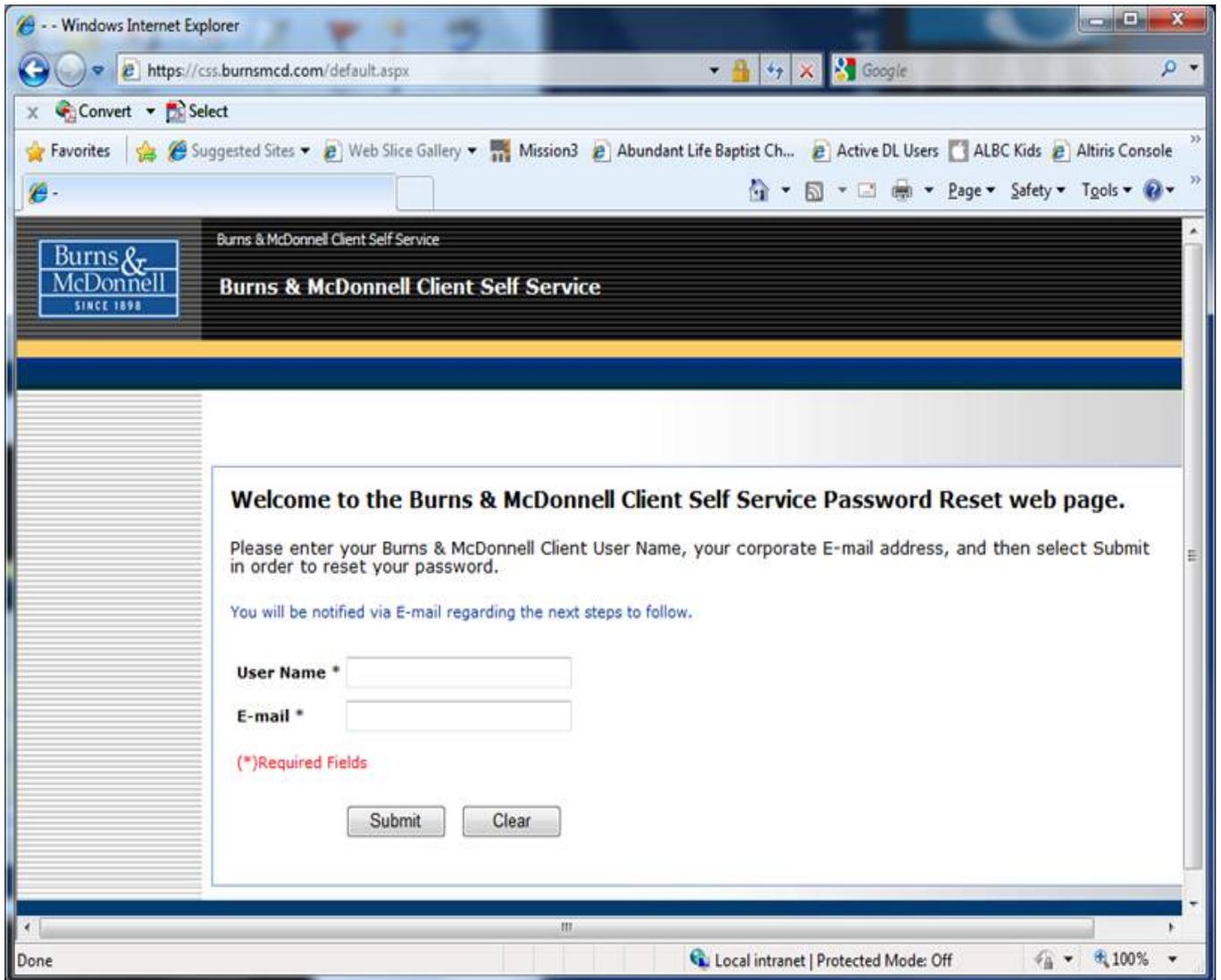
Appendix E

Vendor Submittal Reference Document



If you forgot your password you can have a new password sent to you by clicking the “Forgot your password”. If so, the following screen will appear for requesting a new password.

Request New Password screen:



Appendix E Vendor Submittal Reference Document



Creating a Submittal:

If your password does not need to be changed, use your current User ID and Password to log into WebTools.

Your username and password information will be automatically populated into the BMCD Login screen.

1. To create a submittal click in the Project/Program text box and fill in with the appropriate project name or program number, then click Create Submittal. If a reminder of the appropriate project number is needed, log in to WebTools and view the available project number folders. By clicking on the “Documents” folder the list of available project number will be seen. Descriptions of those projects will be given on the right hand window pane. After the proper project number is verified, log back out to return to the Create Submittal option.

Note: When creating a Submittal, the Repository information is not needed.

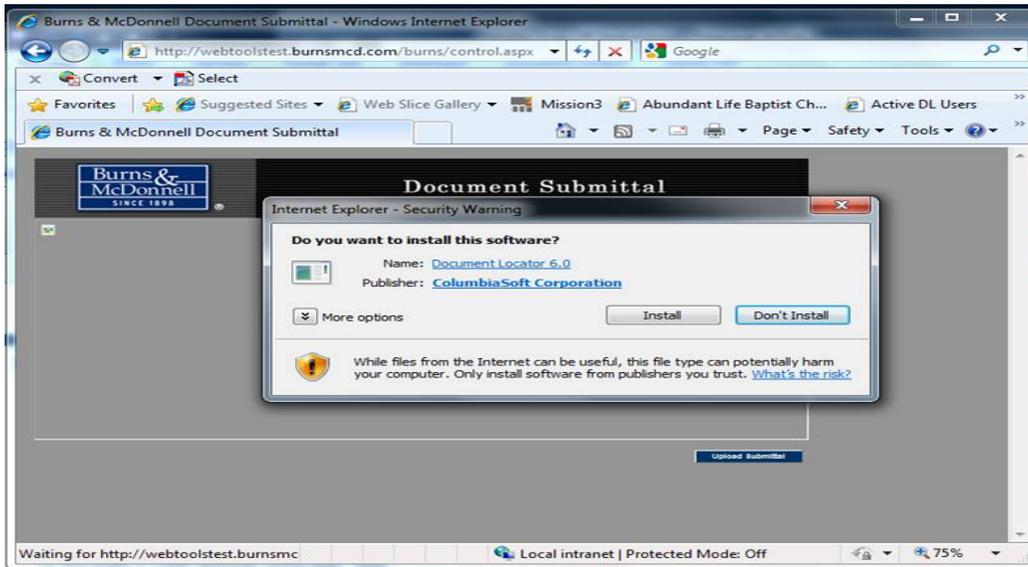
If the number is incorrectly entered the following error message will be displayed. Check the number, if you believe you received this message in error you will need to contact your BMCD Document Control contact.

Appendix E

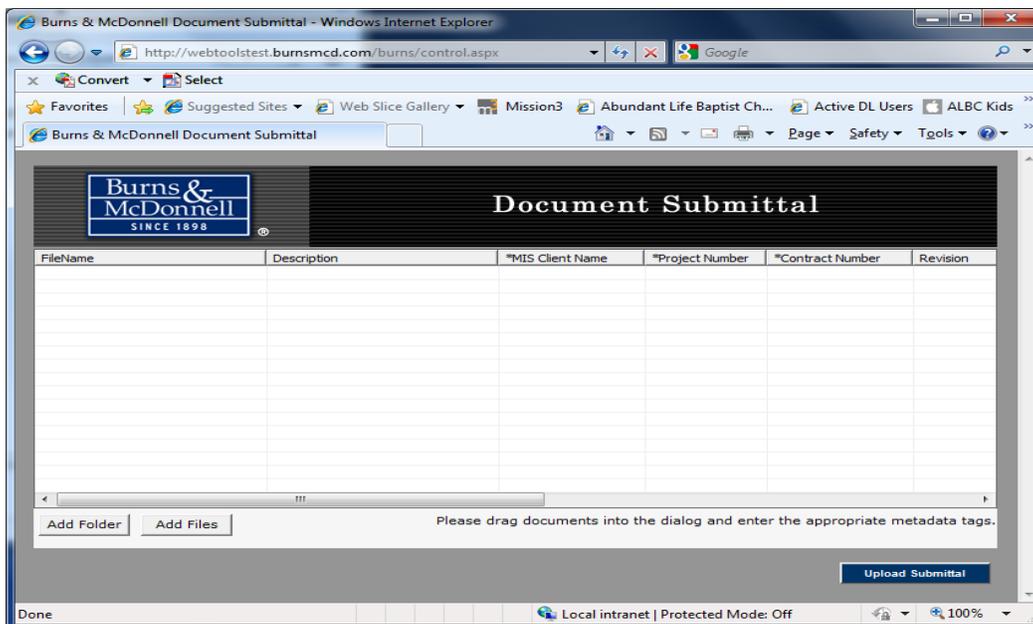
Vendor Submittal Reference Document



- If this is the first time you are visiting the Submittal screen then you will be prompted to load the ActiveX Add-On that will allow you to drag and drop documents into the screen. Click on Install to load the ActiveX Add-On.
Note: Some companies prohibit the install of an ActiveX Add-On. If this is the case for your system administrators please contact your BMCD representative.



- After installing the Active X component, the window is now ready for files to be drag and dropped directly into the grid part of the window.

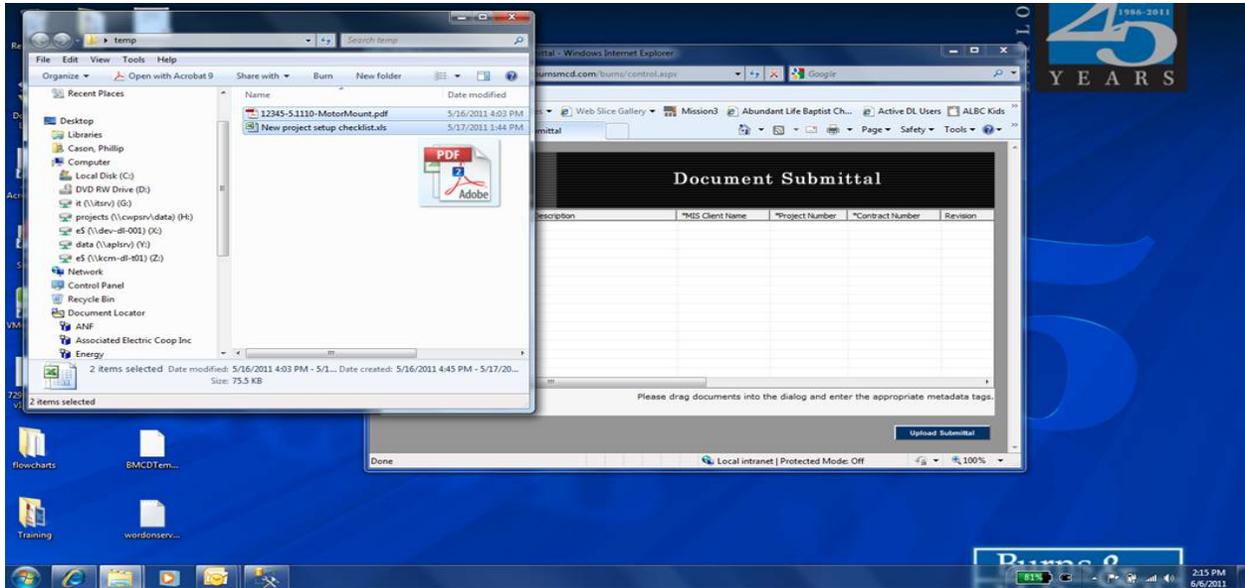


Appendix E

Vendor Submittal Reference Document



2. Select the files from your system and drag them into the window.



One of two options may be used in the Create Submittal window:

- Drag and drop a File
- Use the Add Folder or Add Files buttons in the Document Submittal window.

A vendor transmittal number will be assigned to the Submittal upon receipt. If preferred, a transmittal may be created and added to the list of files as a separate document. Please check with your project team for specific submittal needs.

- The Filename, client name, and project number will be pre-populated in the Create Submittal window. Before dragging the files into the window make sure they follow the file naming requirements.
- **Filename** should be the same as the Drawing Name or Document Number.

Do not include the following in the filenames:

- a. Revision
- b. Dates
- c. Transmittal Information

Note: If the document is being resubmitted then the filename must match EXACTLY with the previous submittal name.

Valid filename examples: A07-9877-8-1.pdf, M-114-1-par.pdf, A-347-wps.pdf, 18555-18 ASME calcs.pdf, Terminal Point List.pdf

Appendix E

Vendor Submittal Reference Document



- **Description** is required and should relate to the **document title** from the title block of the drawing.
Valid description include: General Arrangements, Weld Procedures, Code Calcs, Terminal Point List, Wiring Diagram – Analyzer.
 - **Revision** should be the actual revision from the document title block. If the document does not have a revision enter a dash/hyphen (-).
 - Items with an * in the column name are required. Items that do not include the * may still be required by your project. Please fill in as much detail as possible unless directed otherwise by your BMCD Document Control contact.
- Note: Columns in the window may be resized as needed. If a drop down list is supplied then only those values may be selected. To narrow a list of items or if a value is known, it may be typed or the copy/paste option may be used into the drop down.**

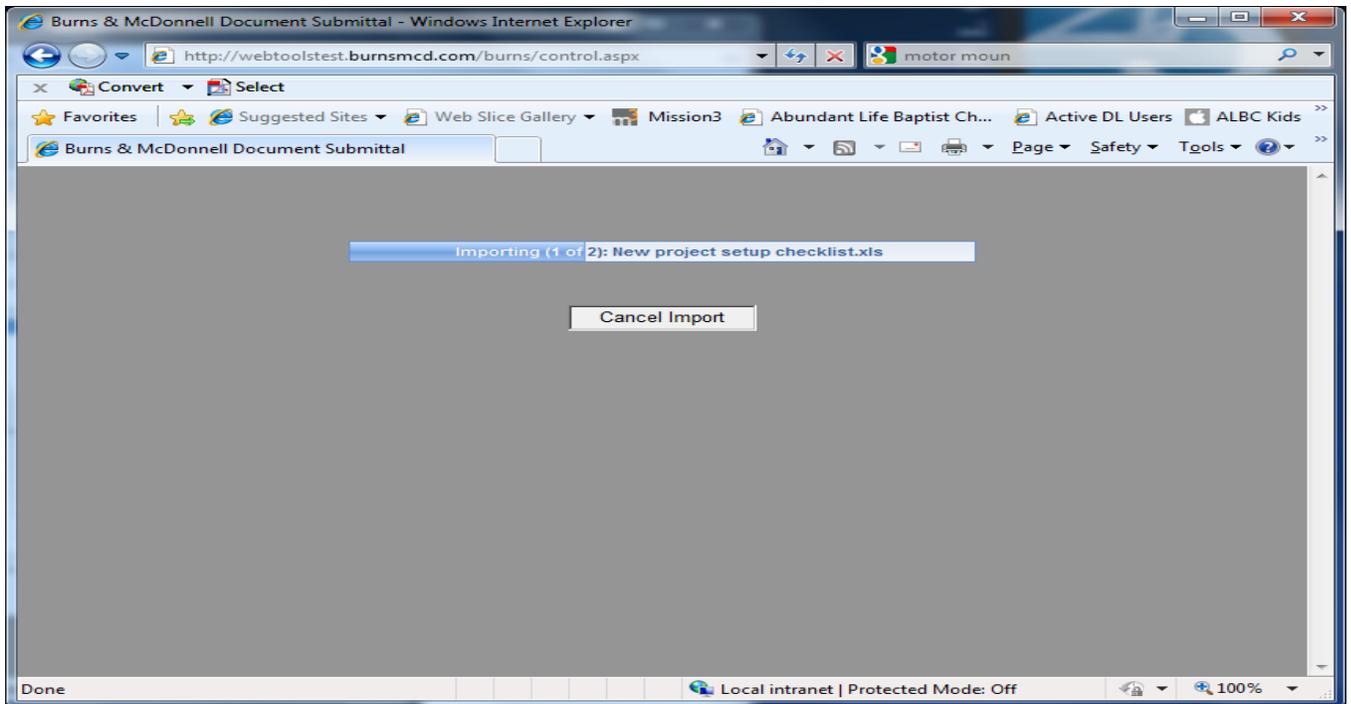
	Description	*MIS Client Name	*Project Number	*Contract Number	Revision	*Subm
setup checklist.xls	Checklist	BurnsMcD Training	12345	5.1110	A	
10-MotorMount.pdf	Motor Mount	BurnsMcD Training	12345	5.1110		

Appendix E

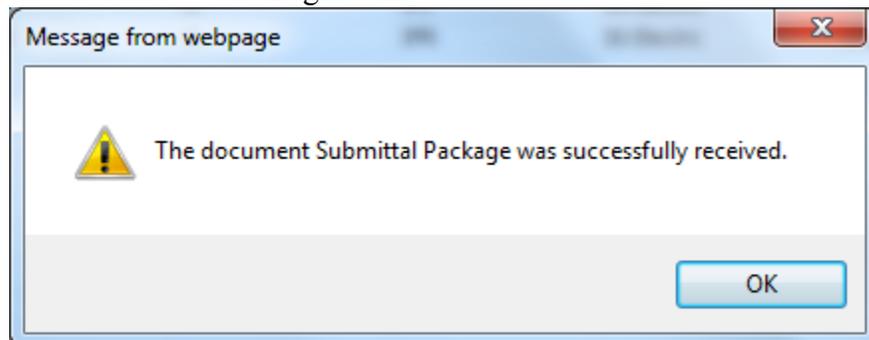
Vendor Submittal Reference Document



3. Click on the Upload Submittal and the files will begin to load.



4. When complete you will be prompted that the Package was successfully received. Click OK and you will be returned to the Login Window.



Notification of Receipt:

Within a few minutes you will receive an email notice that will include a link to a transmittal receipt. If there is a correction made to the submittal you may receive an additional notice that will include a link to the updated transmittal receipt.

Appendix E

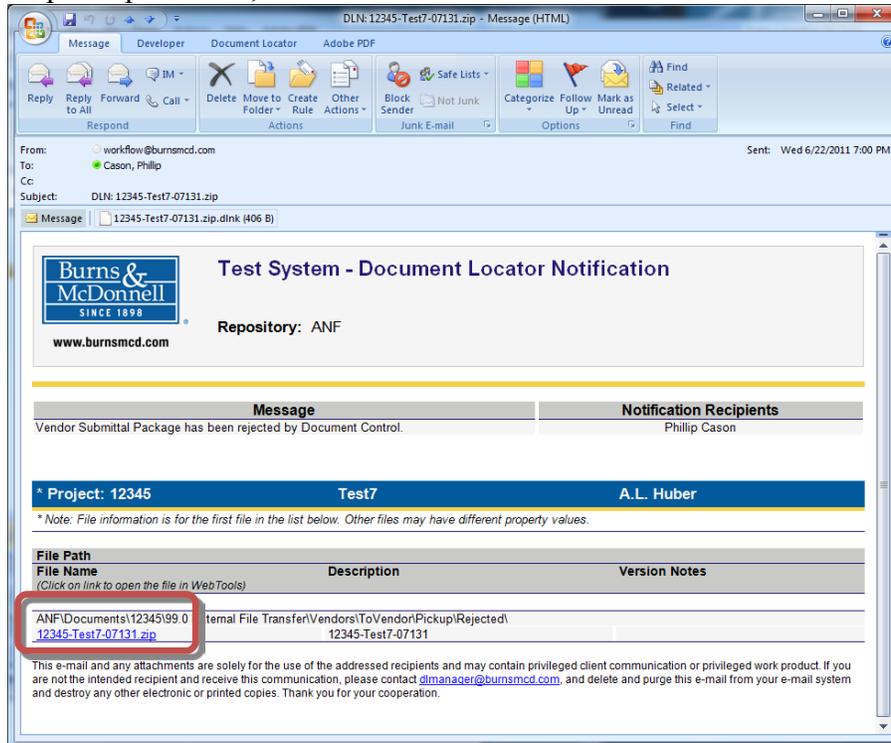
Vendor Submittal Reference Document



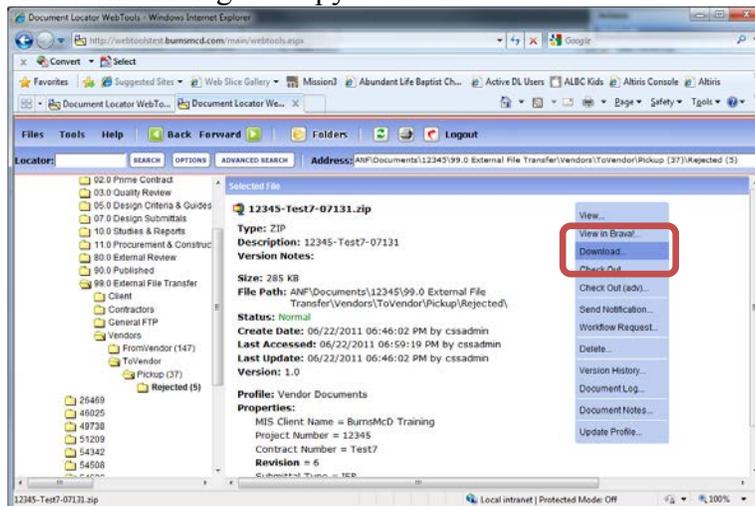
Picking up a Reviewed Submittal

If your Submittal is being return after a review or is rejected, you will receive an email from the system with a link to a zip file consisting of the files.

1. To pick up the files, Click the File link.



2. After logging into WebTools you will be directed to the document for pickup. Click on Download to get a copy of the file.



3. Select a location on your hard drive to save the file and click ok.

SECTION 016001 - EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes general requirements for transportation and handling, delivery, storage, and protection of Supplier-furnished Equipment and Materials.
- B. Related SECTIONS:
 - 1. Submittals: SECTION 013301.

1.02 DEFINITIONS:

- A. Terms used in this SECTION are not intended to negate the meaning of other terms used in the Contract, including such terms as "systems," "structures," "finishes," "accessories," "furnishings," "special construction," and similar terms. Such terms are self-explanatory and have recognized meanings in the construction industry.

1.03 QUALITY ASSURANCE:

- A. Equipment and Material incorporated into the Work:
 - 1. Conform to the Specifications and applicable codes, standards, and requirements of regulatory agencies.
 - 2. Provide Products that comply with the requirements of the Contract, undamaged and, unless otherwise indicated, new and unused at the time of installation. Provide Products that are complete with all accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for the intended use and effect.
 - a. Standard Products: Where they are available and comply with the Specifications, provide standard Products of types that have been produced and used successfully in similar situations on other projects.
 - b. Continued Availability: Where, because of the nature of its application, Owner is likely to need replacement parts or additional amounts of a product at a later date, either for maintenance and repair or replacement, provide standard Products for which the manufacturer has published assurances that the products and its parts are likely to be available to Owner at a later date.
 - 3. Comply with size, make, type, and quality specified, or as specifically approved in writing by Owner.
 - 4. Manufactured and Fabricated Products:
 - a. Design, fabricate, and assemble in accordance with the applicable standard trade, engineering, and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
 - c. Two or more items of the same kind shall be identical, by the same manufacturer.
 - d. Equipment and Material shall be suitable for service conditions intended.
 - e. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing by Owner.

SECTION 016001 - EQUIPMENT AND MATERIALS: Continued

5. Do not use Material or Equipment for any purpose other than that for which it is designed or is specified.
- B. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
 1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated Equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
 - a. Name of product and manufacturer including address and telephone number.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
- C. Electronic Equipment Compliance:
 1. Supplier warrants that all equipment, devices, items, systems, software, hardware, or firmware provided shall properly, appropriately, and consistently function and accurately process date and time data (including without limitation: calculating, comparing, and sequencing). This warranty supersedes anything in the Contract which might be construed inconsistently. This warranty is applicable whether the equipment, device, item, system, software, hardware, or firmware is specified with or without reference to a manufacturer's name, make, or model number.

1.04 TRANSPORTATION AND HANDLING:

- A. Shipment Preparation:
 1. Supplier shall prepare Equipment and Materials for shipment in a manner to facilitate unloading and handling, and to protect against damage or unnecessary exposure in transit and storage. Provisions for protection shall include the following:
 - a. Crates or other suitable packaging materials.
 - b. Covers and other means to prevent corrosion, moisture damage, mechanical injury, and accumulation of dirt in motors, electrical equipment, and machinery.
 - c. Suitable rust-preventive compound on exposed machined surfaces and unpainted iron and steel.
 - d. Grease packing or oil lubrication in all bearings and similar items.
- B. Marking: Tag or mark each item of Equipment and Material as identified in the delivery schedule or on Submittals and include complete packing lists and bills of material with each shipment. Each piece of every item need not be marked separately provided that all pieces of each item are packed or bundled together, and the packages or bundles are properly tagged or marked.

SECTION 016001 - EQUIPMENT AND MATERIALS: continued

- C. Bills of Material: Supplier shall mail bills of material to Engineer prior to delivery of each shipment and shall include bills of material with each shipment.
- D. Delivery:
 - 1. Furnish Engineer all requirements for unloading and handling of Equipment and Materials upon delivery sufficiently in advance to allow installing contractor sufficient preparation time. Include type and capacity of unloading equipment required as applicable.
 - 2. Deliver Equipment and Materials in an undamaged condition, in original containers or packaging, with identifying labels intact and legible.
 - 3. Mark partial deliveries of component parts to identify the Equipment or Material, to permit easy accumulation of parts, and to facilitate assembly.
- E. Receipt and Unloading:
 - 1. Deliver all Equipment and Materials complete with packing lists and bills of material. Installing contractor will furnish receipts to shipper upon delivery.
 - 2. Installing contractor will receive, check, unload, inventory, accept, and store all Equipment and Materials delivered to the Point of Delivery in accordance with proper notice. Installing contractor will report any damage to prior to or during unloading and notify Owner's site representative of any shortage at time of delivery. Owner's site representative will verify such reports and so notify Supplier.

1.05 STORAGE AND PROTECTION:

- A. Storage Requirements:
 - 1. Furnish Engineer all requirements for storage and protection of all Equipment and Materials with notice of shipment, to allow installing contractor sufficient preparation time.
 - 2. Installing contractor will furnish all facilities needed for storage of Equipment at the Project Site.
 - 3. Installing contractor will assume responsibility for and protect all Equipment in accordance with Supplier's recommendations.

PART 2 - PRODUCTS - Specified in applicable Sections.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 016001

SECTION 017501 - MANUFACTURER'S FIELD SERVICES

PART 1 - GENERAL

1.01 SUMMARY:

- A. This SECTION includes requirements of manufacturers of Equipment and Materials for Field Services as defined and specified herein to be performed at the Project Site in regards to erection, start-up, and testing of Equipment and Materials.

1.02 SERVICES REQUIRED:

- A. Services with Equipment and Materials furnished under this Contract:
 1. Furnish the services of qualified, competent field representative and necessary assistants for Equipment and Materials furnished under this Contract, as required to perform all manufacturers' Field Services called for in the Specifications. Field representative shall be certified by the manufacturer of the specified product or system as having the necessary knowledge and experience to perform the required functions.
 2. Where such service is specified, installing contractor will not perform any work related to the installation or operation of Equipment or Materials furnished under this Contract without direct observation and guidance of the Supplier's or manufacturer's field personnel unless Owner concurs otherwise.
 3. Supplier shall arrange to have the Supplier's or manufacturer's field personnel perform the following:
 - a. Supervise the initial start-up, operational check, and any required adjustments of Equipment.
 - b. Instruct Owner's designated personnel in proper operation and maintenance of all Equipment and Materials as required by Owner.
 4. Supplier shall arrange for field personnel to report to the Site at times designated by Owner's site representative, advise Owner's site representative of arrival at the Site, and furnish Owner's site representative a written report covering all Work done at least once each week and when completed.
 5. Field representative shall be acceptable to Owner and Owner's site representative and shall not be changed during the installation operations without Owner's consent unless field representative proves unsatisfactory to Owner and Owner's site representative.
 6. Field representative shall represent Supplier at the Site, and all instructions given to him shall be as binding as if given to Supplier.
 7. Direct responsibility for planning, supervising, and executing the installation work of Equipment will remain with installing contractor.
 8. All start-up, adjustments, and testing of Equipment will be performed in the presence of Owner and Supplier's field representative, unless otherwise agreed, and such operations will be in accordance with Supplier's instructions.
 9. It shall be the duty of Supplier's field representative during the progress of start-up and testing, and such other times as may be required by Owner's site representative, to instruct Owner's designated personnel in the proper operation and maintenance of the

SECTION 017501 - MANUFACTURER'S FIELD SERVICES: continued

Equipment. Such instruction shall terminate only when both the Supplier's field representative and Owner are satisfied that the Owner's personnel are properly instructed.

PART 2 - PRODUCTS: Specified in applicable Sections.

PART 3 - EXECUTION

3.01 OPERATION AND TESTING:

- A. Duties of the field representative during erection or installation shall include:
 - 1. Instructing and guiding the installing contractor concerning proper methods and procedures on all technical phases of installation.
 - 2. Inspecting and indicating approval or disapproval of each phase of the Work as it progresses.
 - 3. Reporting his observations in writing to the installing contractor, with copies to Owner, at least once each week unless otherwise agreed.
 - 4. Determining when Equipment is ready for start-up and operational checks.
- B. Placing Equipment in operation:
 - 1. Installing contractor will place all Equipment and Materials furnished by this Contract into successful operation according to instructions of the Supplier or manufacturer, or field representative, including making of all required adjustments, tests, operation checks, and the following as applicable:
 - a. Cleaning, sounding, blowing-out, flushing of lubricating oil and water systems and other pipelines.
 - b. Lubrication supplied by Supplier unless specified to be furnished by Owner or others.
 - c. Tests of lubrication system safety interlocks and system performance.
 - d. Final alignment checks and measurements made under observation of Owner or Owner's site representative. Alignment checks shall include opening connections if required to ensure there are no abnormal stresses on Equipment from pipes, ducts, or other attachments. Alignment shall be within tolerances specified by the manufacturer, and measurements shall be recorded and furnished to Owner's site representative.
 - e. Motor rotation checks before connecting couplings.
 - f. Inspection of sleeve bearings for adequate contact.
 - g. Checking of anchor-bolt tensions, grout, and shims. Anchor bolts shall be tightened with calibrated torque wrenches using care not to over stress bolts.
 - 2. After "run-in" and acceptance of alignment, major Equipment shall be affixed in place using standard tapered dowels with jack-out nuts at head end to facilitate removal.
 - 3. All above operations shall be recorded on forms either furnished by Owner or by Supplier and approved by Owner and Owner's site representative.

SECTION 017501 - MANUFACTURER'S FIELD SERVICES: continued

4. Provide all necessary field representatives and assistants as part of the Work to accomplish the above operations until such time as individual items, systems, Equipment, or sections of the plant are acceptable for operation by Owner.
 5. With advice of Supplier, installing contractor will provide the required utilities for placing Equipment in operation, and Owner's personnel may assist or witness.
- C. Performance Tests:
1. Equipment and Materials Furnished under this Contract:
 - a. Owner may conduct acceptance tests after installation to determine if the Equipment and Materials installed as part of the Work perform in accordance with the Contract and as guaranteed. Final acceptance of Equipment and Materials will be based on acceptable results of such tests.
 - b. No tests will be conducted on Equipment or Materials for which manufacturer's Field Services are specified unless manufacturer's field representative is present and declares in writing that the Equipment and Materials are ready for such test.
 - c. Supplier will be notified by Owner's site representative so that Supplier can have a representative, or manufacturer's representative, present during any tests of Equipment or Materials furnished by this Contract for which manufacturer's Field Services are not specified.
 - d. The tests will be made as set forth in the Contract unless the interested parties mutually agree upon some other manner of testing.

END OF SECTION 017501

SECTION 017801 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY:

- A. Related Work Specified Elsewhere:
 - 1. Prerequisites for final acceptance and payment: Attachment A Commercial Terms & Conditions.
 - 2. Submittals: SECTION 013301.
 - 3. Manufacturer's Field Services: SECTION 017501.
 - 4. Warranties: Attachment A Commercial Terms & Conditions.

1.02 REQUIREMENTS FOR FINAL PAYMENT:

- A. Unless otherwise required elsewhere by this Contract, the following shall be furnished to Owner prior to application for final payment.
 - 1. Field Services.
 - 2. Maintenance and operating instructions.
 - 3. Guarantees.
 - 4. Certifications of inspection.
 - 5. "Record Document" Submittals.
 - 6. Other documents as required by the Contract.
 - 7. Spare parts.

1.03 PROJECT RECORD DOCUMENTS:

- A. General: Maintain at the Supplier's facilities one record copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Approved Shop Drawings, Product Data, and Samples.
- B. Recording:
 - 1. Label each document "PROJECT RECORD" in neat, large, printed letters.
 - 2. Record information concurrently with fabrication or Field Services progress.
 - 3. Record Drawings: Legibly mark to record actual construction:
 - a. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
 - b. Field changes of dimension and detail.
 - c. Changes made by Change Order or other modifications to the Contract. Note related Change Order numbers where applicable.
 - d. Details not on original drawings included in the Contract.
 - 4. Record Specifications and Addenda: Legibly mark each Section to record:
 - a. Manufacturer, trade name, catalog number, and supplier of each product and item of Equipment actually furnished, particularly optional and substitute items.
 - b. Changes to the Contract made by addendum, Change Order, or other modifications.
 - c. Related Submittals.

SECTION 017801 - CONTRACT CLOSEOUT: Continued

5. Record Product Data: Maintain one copy of each product data Submittal, and mark-up significant variations in actual Work in comparison with submitted information.
 - a. Include both variations in product as delivered to Point of Delivery, and variations from manufacturer's instructions and recommendations for installation.
 - b. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily observed. Note related Change Orders and mark-up of record drawings and specifications.
 6. Miscellaneous Record Submittals: Refer to other SECTIONS of these Specifications for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work.
 7. Instruction Books and Operating Manuals: Specified in SECTION 013301.
 8. Electronic Documentation:
 - a. Provide electronic versions of record documents showing "as-constructed" conditions, master field drawing list showing final revisions, instruction books, and operating manuals on CD-ROM or flash drive in searchable Adobe PDF and AutoCAD 2012 or later.
- C. Delivery:
1. Deliver Record Documents to Owner.
 2. Accompany submittal with transmittal letter in duplicate, containing:
 - a. Date.
 - b. Contract title and number.
 - c. Supplier's name, address, and telephone number.
 - d. Number and title of each Record Document.
 - e. Signature of Supplier's authorized representative.

1.04 WARRANTIES AND BONDS:

- A. Specified in Attachment A Commercial Terms & Conditions.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 017801

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract and DIVISION 01 Specification Sections, apply to this Section.

1.02 SUMMARY:

- A. Section includes 3 Generator-Side Make-Up Air Units, each factory-packaged and capable of supplying 100% outdoor air.
- B. Refer to Equipment Schedule on drawings if applicable.

1.03 REFERENCES:

- A. Applicable Standards (Latest Edition):
 1. Air Movement and Control Association International, Inc. (AMCA):
 - a. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating (ANSI).
 2. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):
 - a. ASCE/SEI 7 - Minimum Design Loads for Buildings and Other Structures.
 3. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - a. ASHRAE 52.1 - Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter (ANSI).
 - b. ASHRAE 52.2 - Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size (ANSI).
 - c. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality (ANSI).
 4. ASTM International (ASTM):
 - a. ASTM C534 - Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 - b. ASTM C916 - Specification for Adhesives for Duct Thermal Insulation.
 - c. ASTM C1071 - Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
 5. Code of Federal Regulations (CRF):
 - a. 40 CFR, Part 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
 6. International Electrotechnical Commission (IEC):
 - a. IEC 60947-4-1 (Amendment 2) - Part 4: Contactors and Motor Starters: Section 1, "Electromechanical Contactors and Motor Starters."
 7. National Electrical Manufacturers Association (NEMA):
 - a. NEMA 250 - Enclosures for Electrical Equipment (1,000V Maximum).
 - b. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V Maximum).
 8. NFPA:
 - a. NFPA 70 - National Electrical Code.
 - b. NFPA 90A - Installation of Air-Conditioning and Ventilating Systems.
 9. Underwriters Laboratories, Inc. (UL):
 - a. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

1.04 ACTION SUBMITTALS:

- A. Product Data: For each type of product. Include rated capacities, operating characteristics, fan curves, sound power data, filter data (if applicable), and furnished specialties and accessories.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.
 - 4. Provide equipment sequence of operation and recommended spare part list.

1.05 CLOSEOUT SUBMITTALS:

- A. Operation and Maintenance Data: Include emergency, operation, and maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS:

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and equipment tag number.
 - 1. Fan Belts: One set for each type of belt-driven fan.
 - 2. Filters: One set of each type per unit.

1.07 QUALITY ASSURANCE:

- A. Perform all manufacturer's standard tests for the equipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. AbsolutAire, Inc.
- B. Aerovent
- C. Cambridge Engineering.
- D. Hartzell Manufacturing.
- E. Rapid Engineering, LLC.

2.02 PERFORMANCE REQUIREMENTS:

- A. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Generator-Side Ventilators, MAU-P-1B through MAU-P-3B:
 - 1. Capacities and Characteristics: SEE SCHEDULE.

2.03 CABINET:

- A. Construction: Single wall.
- B. Exterior Casing Material: 16-gauge aluminized steel with painted exterior.
 - 1. Color to be chosen by Owner.
- C. Lifting and Handling Provisions: Factory-installed removable lifting lugs.
- D. Base Perimeter: 3 x 3 x 1/4" welded structural steel.
- E. Support: Galvanized steel formed legs for mounting on pad (shipped loose for nut & bolt field installation).
- F. Access for Inspection, Cleaning, and Maintenance:
 - 1. Service Doors: Hinged access doors with gaskets. Material and construction of doors shall match material and construction of cabinet in which doors are installed.

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

- G. Roof: Fully sealed and weather-proofed, sloped to drain water.
- H. Floor: Not intended for walking on by service personnel.
- I. Cabinet Insulation: Not required.

2.04 SUPPLY FAN:

- A. Plenum Fan Type: Single-width single-inlet (SWSI) backward-inclined airfoil plenum type.
 - 1. Fan Wheel Material: Painted steel.
 - 2. Fan Wheel Drive and Arrangement: Class 2, AMCA Arrangement 3.
 - 3. Fan inlet cone: Precision formed painted steel or aluminum.
 - 4. Fan Bearings: Spherical roller pillow block or flange block type with minimum L-10 100,000 hour bearing life. Fan bearing lubrication lines extended to cabinet exterior. Factory filled, purged, attached and labeled with lubrication schedule.
 - 5. Fan Balance: Factory precision balance fan at or below 0.08 inch/s (2.0 mm/s) at design speed with filters installed.
- B. Service Factor for Belt Drive Applications: V-belt drive with matching fan pulley and adjustable motor sheaves and belt assembly with minimum 1.4 service factor.

2.05 FILTERS:

- A. Extended-Surface, Disposable Panel Filters:
 - 1. Comply with NFPA 90A.
 - 2. Factory-fabricated, dry, extended-surface type.
 - 3. Thickness: 2 inches (50 mm).
 - 4. Minimum Arrestance: 90, according to ASHRAE 52.1.
 - 5. Minimum MERV: 8, according to ASHRAE 52.2.
 - 6. Media: Fibrous material formed into deep-V-shaped pleats and held by self-supporting wire grid.
- B. Mounting Frames:
 - 1. Extended surface filters v-bank arranged, removable from hinged access door.

2.06 ELECTRICAL POWER CONNECTIONS:

- A. General Electrical Power Connection Requirements: Factory-installed and wired switches, motor controllers, transformers, and other necessary electrical devices shall provide a single-point field power connection to unit.
- B. Unit Electrical Enclosure: NEMA 250, Type 4, mounted at unit with hinged access door. To include all electrical components, such as fused disconnect switch, 120-volt and 24-volt transformers, control circuit fuse, and a full number coded terminal strip. The control enclosure shall be lighted with a minimum 15 watt LED or CFL bulb, able to operate with the main disconnect switch in the off or on position.
- C. VFD cabinet shall be furnished separate from the fan assembly for mounting in a remote location.
- D. Factory-Mounted, overcurrent protection for each motor.
- E. Controls: Factory wire unit-mounted controls where indicated.
- F. Control Relays: Auxiliary and adjustable time-delay relays.

2.07 MOTORS:

- A. Acceptable Manufacturers:
 - 1. Baldor
 - 2. TECO
 - 3. WEG

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

- B. Insulation: Class F
- C. Service Factor: 1.15
- D. Provide with Aegis motor shaft grounding ring.

2.08 CONTROLS:

- A. Control Wiring: Factory wire connection for controls power supply.
- B. Control Devices: Sensors, transmitters, relays, switches, detectors, operators, actuators, and valves shall be manufacturer's standard items to accomplish indicated control functions.
- C. Remote Mounted Status Panel:
 - 1. Hand/Off/Auto Controls: Control operational mode.
 - 2. Status Lights:
 - a. Filter dirty.
 - b. Fan operating.
 - 3. Wiring to the VFD, Relief Damper, Fire Alarm Panel, and plant control system from the unit control panel is field provided by Others.
- D. Control Dampers:
 - 1. Damper Location: Factory installed inside unit for ease of blade axle and bushing service.
 - 2. Damper Type: Parallel blade, low leak with blade & edge seals.
 - 3. Damper Rating: Rated for close-off pressure equal to the fan shutoff pressure.
 - 4. Blade Configuration: Unless otherwise indicated, use parallel blade configuration for two-position control and equipment isolation service.
 - 5. Damper Frame Material: Galvanized steel.
 - 6. Blade Material & Type: Formed 16 gauge galvanized steel.
 - 7. Maximum Blade Width: 6 inches (150 mm).
 - 8. Maximum Blade Length: 48 inches (1200 mm).
 - 9. Blade Seals: Replaceable, continuous perimeter vinyl seals and jambs with stainless-steel compression-type seals.
- E. Damper Operators:
 - 1. Factory-installed electric operator for each damper assembly, direct shaft mounted.
 - 2. Operator capable of shutoff against fan pressure and able to operate the damper with sufficient reserve power to achieve smooth modulating action and proper speed of response at the velocity and pressure conditions to which the damper is subjected.
 - 3. Maximum Operating Time: Open or close damper 90 degrees in 30 seconds.
 - 4. Adjustable Stops: For both maximum and minimum positions.
 - 5. Position Indicator and Graduated Scale: Factory installed on each actuator with words "OPEN" and "CLOSED," or similar identification, at travel limits.
 - 6. Spring-return operator to fail-safe closed.
 - 7. Operator Type: Direct coupled, designed for minimum 60,000 full-stroke cycles at rated torque.
 - 8. Position feedback Signal: For remote monitoring of damper position.
 - 9. Coupling: V-bolt and V-shaped, toothed cradle.
 - 10. Circuitry: Electronic overload or digital rotation-sensing circuitry.
- F. Fan Control: Provide N-switch to ensure unit isolation dampers are fully open before starting fan. N-switch shall also ensure that fan does not run unless dampers are fully open.
- G. Fan Speed Control: Standalone control module for link between unit controls temperature signal. VFD speed shall automatically adjust to control to temperature setpoint. Temperature sensors will be wired by others.
 - 1. Hardware interface or additional sensors for the following:
 - a. Room temperature.

SECTION 237433 - DEDICATED OUTDOOR-AIR UNITS: continued

- b. Constant and variable motor loads.
- c. Variable-frequency-controller operation.
- d. As required to implement the sequence of operation.

PART 3 - EXECUTION

3.01 STARTUP SERVICE:

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify operation of remote panel including failure modes. Inspect the following:
 - a. Alarms.
 - 3. Verify that clearances have been provided for servicing.
 - 4. Verify that controls are connected and operable.
 - 5. Verify that filters are installed.
 - 6. Adjust fan belts to proper alignment and tension.
 - 7. Start unit.
- B. After startup, verify bearing lubrication, and adjust belt tension.
- C. Remove and replace components that do not properly operate and repeat startup procedures as specified above.
- D. Prepare written report of the results of startup services.

3.02 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 237433

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract and DIVISION 01 Specification Sections, apply to this Section.

1.02 SUMMARY:

- A. Section includes 3 Auxiliary-Side Make-Up Air Units, each factory-packaged and capable of supplying 100% outdoor air.
- B. Refer to Equipment Schedule on drawings if applicable.

1.03 REFERENCES:

- A. Applicable Standards (Latest Edition):
 1. Air Movement and Control Association International, Inc. (AMCA):
 - a. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating (ANSI).
 2. American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI):
 - a. ASCE/SEI 7 - Minimum Design Loads for Buildings and Other Structures.
 3. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - a. ASHRAE 52.1 - Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter (ANSI).
 - b. ASHRAE 52.2 - Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size (ANSI).
 - c. ASHRAE 62.1 - Ventilation for Acceptable Indoor Air Quality (ANSI).
 4. ASTM International (ASTM):
 - a. ASTM C534 - Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
 - b. ASTM C916 - Specification for Adhesives for Duct Thermal Insulation.
 - c. ASTM C1071 - Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
 5. Code of Federal Regulations (CRF):
 - a. 40 CFR, Part 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.
 6. International Electrotechnical Commission (IEC):
 - a. IEC 60947-4-1 (Amendment 2) - Part 4: Contactors and Motor Starters: Section 1, "Electromechanical Contactors and Motor Starters."
 7. National Electrical Manufacturers Association (NEMA):
 - a. NEMA 250 - Enclosures for Electrical Equipment (1,000V Maximum).
 - b. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600V Maximum).
 8. NFPA:
 - a. NFPA 70 - National Electrical Code.
 - b. NFPA 90A - Installation of Air-Conditioning and Ventilating Systems.
 9. Underwriters Laboratories, Inc. (UL):
 - a. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures.

1.04 SUBMITTALS:

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- A. Product Data: For each type of product. Include rated capacities, operating characteristics, fan curves, sound power data, filter data (if applicable), and furnished specialties and accessories.
 - B. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include diagrams for power, signal, and control wiring.
 - 4. Provide equipment sequence of operation and recommended spare part list.
- 1.05 CLOSEOUT SUBMITTALS:
- A. Operation and Maintenance Data: Include emergency, operation, and maintenance manuals.
- 1.06 MAINTENANCE MATERIAL SUBMITTALS:
- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and equipment tag number.
 - 1. Fan Belts: One set for each type of belt-driven fan.
 - 2. Filters: One set of each type per unit.
- 1.07 QUALITY ASSURANCE
- A. Perform all manufacturer's standard tests for the equipment.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS:
- A. AbsolutAire, Inc.
 - B. Aerovent
 - C. Cambridge Engineering.
 - D. Hartzell Manufacturing.
 - E. Rapid Engineering, LLC.
- 2.02 PERFORMANCE REQUIREMENTS:
- A. Electrical components, devices, and accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - B. Auxiliary-Side Ventilators, MAU-P-1A through MAU-P-3A:
 - 1. Capacities and Characteristics: SEE SCHEDULE.
- 2.03 CABINET:
- A. Construction: Single wall.
 - B. Exterior Casing Material: 18-gauge aluminized steel with painted exterior.
 - 1. Color to be chosen by Owner from manufacturer's standard colors.
 - C. Lifting and Handling Provisions: Factory-installed removable lifting lugs.
 - D. Base Perimeter: 2 x 2 x 1/4" welded structural steel.
 - E. Access for Inspection, Cleaning, and Maintenance:
 - 1. Service Doors: Hinged access doors with gaskets and door hold open devices. Material and construction of doors shall match material and construction of cabinet.
 - F. Roof: Fully sealed and weather-proofed. Internally supported to support weight of filter unit mounted on top.
 - G. Floor: Not intended for walking on by service personnel.

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- H. Cabinet Insulation: Not required.
 - I. Cabinet configuration:
 - 1. Join two fan housings horizontally to form a single unit.
 - 2. Joined units are to have a single electrical panel.
- 2.04 SUPPLY FAN:
- A. Fan Type: double-width double-inlet (DWDI) forward curved or single-width single-inlet (SWSI) backward-inclined airfoil plenum type
 - 1. Fan Wheel Material: Steel, mounted on solid-steel shaft.
 - 2. Bearings: Pillow-block bearings rated L₁₀ life of 100,000 hours and shall include extended grease lines to the cabinet exterior, labeled with greasing intervals.
 - B. Service Factor for Belt Drive Applications: V-belt drive with matching fan pulley and adjustable motor sheaves and belt assembly with minimum 1.4 service factor.
- 2.05 OUTDOOR-AIR INTAKE HOOD:
- A. Type: Manufacturer's standard hood or louver.
 - B. Materials: Match base cabinet.
 - C. Configuration: Designed to inhibit wind-driven rain and snow from entering unit.
- 2.06 FILTERS:
- A. Extended-Surface, Disposable Panel Filters:
 - 1. Comply with NFPA 90A.
 - 2. Factory-fabricated, dry, extended-surface type.
 - 3. Thickness: 2 inches (50 mm).
 - 4. Minimum Arrestance: 90, according to ASHRAE 52.1.
 - 5. Minimum MERV: 8, according to ASHRAE 52.2.
 - 6. Media: Fibrous material formed into deep-V-shaped pleats and held by self-supporting wire grid.
 - B. Mounting Frames:
 - 1. Removable from hinged access door.
- 2.07 ELECTRICAL POWER CONNECTIONS:
- A. General Electrical Power Connection Requirements: Factory-installed and wired switches, motor controllers, transformers, and other necessary electrical devices shall provide a single-point field power connection to unit.
 - B. Unit Electrical Enclosure: NEMA 250, Type 4, mounted at unit with hinged access door. To include all electrical components, such as fused disconnect switch, 120-volt and 24-volt transformers, control circuit fuse, and a full number coded terminal strip. The control enclosure shall be lighted with a minimum 15 watt LED or CFL bulb, able to operate with the main disconnect switch in the off or on position.
 - C. Factory-Mounted, overcurrent protection for each motor.
 - D. Controls: Remote-mounted control panel field-wired by Others.
 - E. Control Relays: Auxiliary and adjustable time-delay relays.
- 2.08 MOTORS:
- A. Acceptable Manufacturers:
 - 1. Baldor
 - 2. TECO
 - 3. WEG

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- B. Insulation: Class F
- C. Service Factor: 1.15
- D. Non-overloading across entire fan curve.

2.09 CONTROLS:

- A. Control Wiring: Factory wire connection for controls power supply.
- B. Control Devices: Sensors, transmitters, relays, switches, detectors, operators, actuators, and valves shall be manufacturer's standard items to accomplish indicated control functions.
- C. Unit-Mounted Status Panel:
 - 1. Hand/Off/Auto Controls: Control operational mode.
 - 2. Status Lights:
 - a. Filter dirty.
 - b. Fan operating.
 - 3. Wiring to the Starter, Relief Damper, Fire Alarm Panel, and plant control system from the unit control panel is field provided by Others.
- D. Control Dampers:
 - 1. Damper Location: Factory installed inside unit for ease of blade axle and bushing service.
 - 2. Damper Type: Parallel blade, low leak with blade & edge seals.
 - 3. Damper Rating: Rated for close-off pressure equal to the fan shutoff pressure.
 - 4. Blade Configuration: Unless otherwise indicated, use parallel blade configuration for two-position control and equipment isolation service.
 - 5. Damper Frame Material: Galvanized steel.
 - 6. Blade Material & Type: Formed 16 gauge galvanized steel.
 - 7. Maximum Blade Width: 6 inches (150 mm).
 - 8. Maximum Blade Length: 48 inches (1200 mm).
 - 9. Blade Seals: Replaceable, continuous perimeter vinyl seals and jambs with stainless-steel compression-type seals.
- E. Damper Operators:
 - 1. Factory-installed electric operator for each damper assembly, direct shaft mounted.
 - 2. Operator capable of shutoff against fan pressure and able to operate the damper with sufficient reserve power to achieve smooth modulating action and proper speed of response at the velocity and pressure conditions to which the damper is subjected.
 - 3. Maximum Operating Time: Open or close damper 90 degrees in 30 seconds.
 - 4. Adjustable Stops: For both maximum and minimum positions.
 - 5. Position Indicator and Graduated Scale: Factory installed on each actuator with words "OPEN" and "CLOSED," or similar identification, at travel limits.
 - 6. Spring-return operator to fail-safe closed.
 - 7. Operator Type: Direct coupled, designed for minimum 60,000 full-stroke cycles at rated torque.
 - 8. Position feedback Signal: For remote monitoring of damper position.
 - 9. Coupling: V-bolt and V-shaped, toothed cradle.
 - 10. Circuitry: Electronic overload or digital rotation-sensing circuitry.
- F. Fan Control: Provide N-switch to ensure unit isolation dampers are fully open before starting fan. N-switch shall also ensure that fan does not run unless dampers are fully open.
- G. Fan Speed Control: Standalone control module for link between unit controls temperature signal. Fans shall run based on adjustable temperature setpoint with adjustable deadband. Temperature sensors will be wired by others. Fans shall operate in a lead-lag configuration.
 - 1. Hardware interface or additional sensors for the following:
 - a. Room temperature.

SECTION 237434 – DUPLEX DEDICATED OUTDOOR-AIR UNITS: continued

- b. Monitoring:
 - (1) On-off status
 - (2) Common trouble alarm
 - (3) As required to implement the sequence of operation.

PART 3 - EXECUTION

3.01 STARTUP SERVICE:

- A. Engage a factory-authorized service representative to perform startup service.
 - 1. Complete installation and startup checks according to manufacturer's written instructions.
 - 2. Verify operation of remote panel including failure modes. Inspect the following:
 - a. Alarms.
 - 3. Verify that clearances have been provided for servicing.
 - 4. Verify that controls are connected and operable.
 - 5. Verify that filters are installed.
 - 6. Adjust fan belts to proper alignment and tension.
 - 7. Start unit.
- B. After startup, verify bearing lubrication, and adjust belt tension.
- C. Remove and replace components that do not properly operate and repeat startup procedures as specified above.
- D. Prepare written report of the results of startup services.

3.02 DEMONSTRATION:

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 237433

SECTION 239433 - DATA TO BE SUBMITTED WITH BID – OUTDOOR-AIR UNITS

PART 1 - GENERAL

1.01 PERFORMANCE GUARANTEES:

- A. Each Generator-Side Make-Up Air Unit shall be guaranteed for the following:
 - 1. Discharge capacity at design conditions, cfm _____
 - 2. Discharge pressure at design conditions, in wg _____
 - 3. Brake horsepower required at design point _____
- B. Each Auxiliary-Side Make-Up Air Unit shall be guaranteed for the following:
 - 1. Discharge capacity at design conditions, cfm _____
 - 2. Discharge pressure at design conditiond, in wg _____
 - 3. Brake horsepower required at design point _____

1.02 DESCRIPTION OF EQUIPMENT:

- A. Generator-Side Make-Up Air Units:
 - 1. Fan:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Wheel Size _____
 - d. Type _____
 - 2. Air Filter:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. MERV Rating _____
 - d. Clean Pressure Drop, in wg _____
 - e. Recommended Dirty Filter Allowance, in wg _____
 - 3. Housing
 - a. Length, in. _____
 - b. Width, in. _____
 - c. Height, in. _____
 - 4. Motors
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Frame Size _____
 - d. Nameplate Rating, bhp _____
 - e. Service Factor _____
 - f. Rated Speed, rpm _____
 - g. Rated Voltage _____
 - h. Full Load Current, Amperes _____
 - i. Locked Rotor Current, Amperes _____
 - j. Design Efficiency, percent: _____
 - 5. Variable Frequency Drives:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Frame Size _____
 - d. Nameplate Rating, bhp _____
 - e. Service Factor _____
 - f. Maximum Speed, rpm _____
 - g. Rated Voltage _____
 - h. Full Load Current, Amperes _____

SECTION 239433 - DATA TO BE SUBMITTED WITH BID – OUTDOOR-AIR UNITS: continued

- i. Locked Rotor Current, Amperes _____
- j. Design Efficiency, percent _____
- k. Power Factor _____
- l. Number of Poles _____
- B. Auxiliary-Side Make-Up Air Units:
 - 1. Fans:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Wheel Size _____
 - d. Type _____
 - 2. Air Filter:
 - a. Manufacturer _____
 - b. Model Number _____
 - c. MERV Rating _____
 - d. Clean Pressure Drop, in wg _____
 - e. Recommended Dirty Filter Allowance, in wg _____
 - 3. Housing
 - a. Length, in. _____
 - b. Width, in. _____
 - c. Height, in. _____
 - 4. Motors
 - a. Manufacturer _____
 - b. Model Number _____
 - c. Frame Size _____
 - d. Nameplate Rating, bhp _____
 - e. Service Factor _____
 - f. Rated Speed, rpm _____
 - g. Rated Voltage _____
 - h. Full Load Current, Amperes _____
 - i. Locked Rotor Current, Amperes _____
 - j. Design Efficiency, percent: _____

1.03 SUPPLEMENTAL INFORMATION:

- A. Submit the following information on separate sheets with Bid:
 - 1. Fan performance curves showing capacity and horsepower.
 - 2. Dimensioned outline drawings of each item of Equipment proposed.
 - 3. A functional description or schematic diagram of the control system.
 - 4. Weights of all pieces of Equipment.
 - 5. A list of major separate items which will be shipped to power plant Site.
 - 6. Description of proposed test procedure for each major item of Equipment.
 - 7. A list of recommended spare parts including a price for each part.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 239433

DIVISION 26 - ELECTRICAL

SECTION 260002 - ELECTRICAL EQUIPMENT - GENERAL TECHNICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY:

- A. The electrical Equipment supplied under this Contract will be used in conjunction with Owner's new natural gas fired reciprocating engine plant.
- B. Furnish new Equipment with all auxiliary items except those specified as furnished by Owner, required for complete Equipment systems as specified. This shall include all materials required for complete field assembly, installation, and operation.
- C. Furnish to coordinate completely in physical arrangement, and physical and electrical connections to Equipment and structures furnished by Owner.
- D. Related Work Specified Elsewhere:
 - 1. Heating, Ventilating, and Air Conditioning: DIVISION 23.

1.02 REFERENCES:

- A. Applicable Codes and Standards:
 - 1. American Society for Testing and Materials (ASTM):
 - a. A6 - General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bar for Structural uses.
 - b. A36 - Structural Steel.
 - c. A123 - Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged-Steel Shapes, Plates, Bars, and Strip.
 - d. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - e. A283 - Low and Intermediate Tensile-Strength Carbon-Steel Plates, Shapes and Bars.
 - f. A325 - High-Strength Bolts for Structural Steel Joints.
 - g. B187 - Copper Bus Bar, Rod and Shapes.
 - h. B236 - Aluminum Bars for Electrical Purposes (Bus Bars).
 - i. B317 - Extruded Aluminum-Alloy Bars, Rods, Pipe, and Structural Shapes for Electrical Purposes.

1.03 DELIVERY :

- A. Ship Equipment as completely assembled as possible, within construction limitations at Owner's Site. Factory-install all component Equipment specified. Ship Equipment assemblies with all components completely installed, other than normal draw-out type components such as removable breaker elements.
- B. Tag and package all maintenance equipment, spare parts, and special tools separately. Identify on bill of lading as "Owner's Spare Parts."

1.04 EQUIPMENT QUALIFICATION:

- A. All Equipment and Material designs furnished shall be identical to equipment and material designs having an acceptable history of domestic service for a period of not less than three years at comparable temperature, voltage, and design stress levels.
- B. Equipment and Material designs with less than three years of actual service will be considered from established manufacturers, but shall be furnished only if accepted by Engineer and Owner prior to award of Contract.

SECTION 260002 - ELECTRICAL EQUIPMENT - GENERAL TECHNICAL REQUIREMENTS:
continued

- C. All major Equipment furnished shall be manufactured at Supplier's own plants, unless otherwise approved by Engineer. Minor auxiliary items not manufactured by Supplier shall be supplied by manufacturers approved by Engineer.

1.05 JOB CONDITIONS:

- A. See conditions as stated in SECTION 011100.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS:

- A. Furnish Materials suitable for their application, and for the mechanical and electrical stresses to which they will be subjected.
- B. Furnish all current-carrying parts of high-conductivity copper unless specified otherwise.
- C. Silverplate or tinplate all primary current connections and joints. Plating shall be done after all drilling and cutting operations are completed.
- D. Provide space, cutouts, drilling, and blank plates for future equipment and for equipment installed by others where specifically indicated.
- E. Engraved laminated plastic nameplates shall be as follows:
 - 1. Fabricated from laminated matte finish white plastic with black core. Size of nameplates:
 - a. 1-1/2 inches high and 6 inches long for "Master" nameplates, with 3/8-inch letters.
 - b. 1 inch high and 2 to 3 inches nominal length for individual device nameplates with 3/16-inch letters.
 - 2. Engrave designations as required later by the Engineer.
 - 3. Attach nameplates by permanent adhesive or screws. Double-sided tape is not acceptable.
- F. Wiring:
 - 1. Furnish all wiring integral to all Equipment, including wiring across shipping splits and, where specifically indicated, wiring for future equipment and for equipment installed by others. Factory install all wiring integral to each shipping group, one end of all wiring across shipping splits, and one end of all wiring for future equipment and for equipment installed by others.
 - 2. Make all internal wiring connections at Equipment terminals or terminal blocks; splices in wiring will not be acceptable.
 - 3. Terminate all points requiring external wiring connections, all points requiring field connection to wiring leads from other shipping sections, and all spare contacts on control switches, auxiliary switches, and lockout relays at numbered points on terminal blocks located in the Equipment control compartments.
 - 4. Connect all wiring as indicated on approved Contractor's schematic and connection drawings.
 - 5. Group terminal blocks for external connection to conveniently receive the Owner's cables. Locate terminal blocks for connections across shipping splits adjacent to the split. Terminal blocks for external connection on draw-out breakers shall be fully accessible with the removable breaker element in either the "connected" or "test" position.
 - 6. No more than two wires shall be terminated at any one terminal block stud or screw.
 - 7. Use stranded, tinned copper switchboard wire, insulated for 600VAC, 90°C copper temperature, Type SIS, as follows for internal wiring:

SECTION 260002 - ELECTRICAL EQUIPMENT - GENERAL TECHNICAL REQUIREMENTS:
continued

<u>Type of Circuit</u>	<u>Minimum Wire Size</u>
Indicating light or annunciator	12 AWG
Transducer outputs	12 AWG (shielded)
Power supply branch circuit	12 AWG

8. Install internal wiring in horizontal and vertical wiring troughs or neatly dressed wire bundles for easy accessibility to interior wiring.
 9. Label all wires at equipment studs and terminal blocks with slip-on wire sleeves stamped to indicate wire number or destination terminal number as indicated on approved connection drawings.
 10. Connect all internal grounds to the Equipment internal ground bus.
 11. Terminate all internal wiring individually with pre-insulated ring-tongue-type compression terminals on stud or screw-type terminals.
- G. Terminal Blocks:
1. All terminal blocks shall be heavy duty, rated not less than 30 amperes, 600 volts.
 2. Identify each terminal on each block with a permanent designation.
 3. Mount terminal blocks vertically in rows with provisions for supporting external control cables entering from the top or bottom.

2.02 ELECTRONIC EQUIPMENT COMPLIANCE:

- A. Supplier warrants that all equipment, devices, items, systems, software, hardware, or firmware provided shall properly, appropriately, and consistently function and accurately process date and time data (including without limitation: calculating, comparing, and sequencing). This warranty supersedes anything in the Specifications or other Contract Documents which might be construed inconsistently. This warranty is applicable whether the equipment, device, item, system, software, hardware, or firmware is specified with or without reference to a manufacturer's name, make, or model number.

PART 3 - EXECUTION

- A. Owner and Engineer shall be allowed to visit the plant at any point throughout the manufacturing of the Equipment to verify schedule progress without a Contract Price increase after award of the Contract.

END OF SECTION 260002

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS

PART 1 - GENERAL

1.01 SUMMARY:

- A. This Section includes alternating current electric motors required to drive the equipment furnished under this Contract.
- B. Except as otherwise specified in the driven equipment Divisions, all alternating current motors other than valve and gate motor operators (and special application motors shall be as specified in this SECTION.
- C. Related Work Specified Elsewhere:
 - 1. Dedicated Outdoor-Air Units: SECTION 237433.
 - 2. Duplex Dedicated Outdoor-Air Units: SECTION 237434.

1.02 REFERENCES:

- A. Design, fabricate, assemble, and test equipment and materials to conform to the following codes and standards:
- B. American Bearing Manufacturers Association (ABMA):
 - 1. 9 – Load Ratings and Fatigue Life for Ball Bearings.
 - 2. 11 – Load Ratings and Fatigue Life for Roller Bearings.
- C. Institute of Electrical and Electronics Engineers (IEEE):
 - 1. C50.41 Polyphase Induction Motors for Power Generating Stations.
 - 2. 43 - Recommended Practice for Testing Insulation Resistance of Rotating Machinery.
 - 3. 112 - Standard Test Procedure for Polyphase Induction Motors and Generators.
 - 4. 429 - Recommended Practice for Thermal Evaluation of Sealed Insulation Systems for AC Electric Machinery Employing Form-Wound, Pre-Insulated Stator Coils for Machines 6900V and below.
- D. National Electrical Manufacturers Association (NEMA):
 - 1. MG 1 - Motors and Generators.
 - 2. MG 2 - Safety Standard for Construction, and Guide for Selection, Installation, and Use of Electric Motors and Generators.
- E. Underwriters Laboratories, Inc. (UL):
 - 1. 1004 - Standard for Electric Motors.

1.03 SUBMITTALS:

- A. Submit as specified in SECTION 013300.
 - 1. Submittals required include, but are not limited to, the following items:
 - 2. Outline drawing for each group of identical motors.
 - 3. Nameplate data for each group of identical motors rated 460 volts and below, including the following data:
 - 4. Manufacturer's name and serial number.
 - 5. Manufacturer's type and frame designation.
 - 6. Horsepower output.
 - 7. Time rating.
 - 8. Maximum ambient temperature for which motor is designed.
 - 9. Insulation system designation.
 - 10. Temperature rise and method of measurement.
 - 11. RPM at rated load.
 - 12. Frequency.
 - 13. Number of phases.

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS: continued

14. Rated-load amperes.
 15. Voltage.
 16. Code letter for locked-rotor kVA.
 17. Design letter for polyphase integral-horsepower motors.
 18. Nominal efficiency for motors rated 1 through 199 horsepower.
 19. Service factor.
 20. For motors equipped with thermal protectors, the words "thermally protected."
 21. For motors to be installed for inverter service, the words "inverter duty."
- B. Additional data for each group of identical motors rated above 100 horsepower:
1. Acceleration time with connected load.
 2. Allowable locked rotor time.
 3. Starting capabilities.
 4. Thermal limit curve, superimposed on time-current curves during acceleration of the driven equipment at rated voltage and at minimum specified starting voltage.
 5. Torque and speed curves.
 6. Perform the following factory tests on each motor rated 460 volts and below in conformance with NEMA MG 1 and IEEE 112:
 - a. No-load current and speed at normal voltage and frequency.
 - b. High potential test.
 - c. Other standard factory tests.
 7. For each 460-volt motor rated 200 horsepower and larger, certificate of completion of factory tests.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Motors rated 460 volts and below shall be as manufactured by one or more of the following:
1. General Electric Company.
 2. WEG Electric.
 3. Siemens.
 4. U.S. Electrical Motors.
 5. ABB Baldor.
 6. TECO-Westinghouse.
 7. Engineer-approved equal.

2.02 GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS:

- A. Motors shall be continuous-duty (unless otherwise specified) powerhouse type suitable for a powerhouse environment where moderately abrasive conductive dusts and high humidity are present.
- B. Motors shall be self-ventilated.
- C. Motors shall be designed for full voltage starting.
- D. Motors shall be suitable for operation at an altitude specified in SECTION 011100.
- E. Indoor motors shall be suitable for continuous operation at an ambient temperature specified in SECTION 011100 unless otherwise specified.
- F. All motors shall have squirrel-cage rotors.
- G. The nameplate horsepower rating of each motor at 1.0 service factor shall equal or exceed the horsepower required to drive the connected equipment under the design conditions specified and within normal operating ranges. For each motor furnished, the nameplate horsepower

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS: continued

rating multiplied by the service factor shall equal or exceed the horsepower required to drive the connected equipment under any operating condition.

2.03 MOTORS RATED 1/2-HORSEPOWER AND SMALLER:

- A. Rated 115 volts, single phase, 60 hertz.
- B. Service factor of 1.0.
- C. The torque characteristics of each motor at all voltages from 90 to 110% rated voltage shall be as required to accelerate the motor and driven equipment to full speed without damage to the motor or the driven equipment.
- D. All windings shall be copper. Aluminum windings will not be accepted.
- E. Insulation shall be Class B or Class F, with Class B temperature rise in accordance with NEMA MG 1.
- F. Enclosures shall be fabricated of steel.
- G. Horizontal motors shall be mounted on a common baseplate with the driven equipment.
- H. Manual reset thermal overload protection shall be furnished integral to each motor.
- I. Enclosures shall be totally enclosed non-ventilated.
- J. Enclosures for indoor service shall be totally enclosed non-ventilated.
- K. Enclosures for outdoor service shall be totally enclosed non-ventilated, dust ignition-proof, with an external surface temperature limiting device wired into the motor power leads.

2.04 MOTORS RATED 3/4- THROUGH 200 HORSEPOWER:

- A. Rated 460 volts, 3 phase, 60 hertz.
- B. Service factor of 1.15 for all enclosures except for explosion-proof or dust ignition-proof enclosures which shall have a service factor of 1.0.
- C. Enclosures shall be fabricated of cast iron or steel.
- D. Enclosures shall be totally enclosed non-ventilated or totally enclosed fan cooled.
- E. Enclosures for outdoor service shall be totally enclosed non-ventilated or totally enclosed fan cooled.
- F. Bearings shall be antifriction type, and shall have an ABMA L-10 rating life of not less than 80,000 hours at rated speed, and under the radial and/or thrust loadings encountered within normal operating ranges. The thrust loading corresponding to an ABMA L-10 rating life of 5,000 hours at rated speed shall not be exceeded under any operating condition of the motor or the driven equipment.
- G. Bearings shall be insulated when required to allow for inverter duty operation or to prevent bearing or shaft damage due to stray shaft currents.
- H. Each horizontal motor shall be mounted on a common baseplate with the driven equipment, or shall be furnished with separate sole plates and sub-sole plates to permit removal of the motor without disturbing the alignment of the driven equipment.
- I. Furnish space heaters for all outdoor motors rated 25 horsepower and above. Space heaters shall be rated 120 volts, single phase, 60 hertz.
- J. Additional requirements for motors rated 3/4- through 200 horsepower:
 - 1. The torque characteristics of each motor at all voltages from 90 to 110% rated voltage shall be as required to accelerate the motor and driven equipment to full speed without damage to the motor or the driven equipment.
 - 2. Insulation shall be Class F, with Class B temperature rise at rated horsepower in accordance with NEMA MG 1 unless specified elsewhere.
 - 3. Where combined motor and driven equipment sound levels are specified for items of equipment, systems, or areas, motor sound levels shall be coordinated with driven equipment sound levels to meet the overall sound levels specified. The motor "A"

SECTION 260551 - ALTERNATING CURRENT ELECTRIC MOTORS: continued

weighted sound pressure level shall not in any event exceed 90 dB when measured at a reference distance of 1 meter per IEEE 85.

4. The efficiency of each horizontal single-speed motor shall not be less than that indicated in Table 12-11 of NEMA MG1.
- K. Motors shall be of special high efficiency and high power factor design, including the following design features:
1. Low loss lamination steel.
 2. Increased stator and rotor length.
 3. Increased winding cross section.
 4. High efficiency cooling fan design.
 5. Optimized slot configuration and air gap.
- L. Unless otherwise specified, the efficiency of each motor shall meet or exceed all NEMA Premium Requirements for energy efficiency, with efficiency values certified by NEMA MG1.12.53, both A and B Standards.
- M. Information submitted with the proposal for each motor shall include minimum guaranteed efficiency based on tests performed in accordance with IEEE 112, Method B, with accuracy improvement by segregated loss determination including stray load loss measurement. Information submitted with the proposal shall include percent efficiency and percent power factor at full load, 3/4-load, and 1/2-load.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 260551

SECTION 261923 – VARIABLE FREQUENCY DRIVES

PART 1 - GENERAL

1.01 SUMMARY:

- A. Work in this Section includes furnishing the following:
 - 1. Industrial 6-pulse variable frequency drives for pump, fan, and crane applications.
 - 2. Specified accessories.
 - 3. This Section shall govern all VFDs furnished by Contractor under this Contract.
- B. The Equipment specified in this Section shall also conform to the requirements of SECTION 260002.
- C. Related Work Specified Elsewhere:
 - 1. Heating, Ventilating, and Air Conditioning: DIVISION 23.
 - 2. Alternating Current Electric Motors: SECTION 260551.

1.02 REFERENCES:

- A. Applicable Codes and Standards: Design, fabricate, assemble and test all equipment furnished to conform to the following codes and standards:
 - 1. Institute of Electrical and Electronic Engineers (IEEE):
 - a. 1100 – Powering and Grounding Sensitive Electronic Equipment (Emerald Book).
 - 2. International Electrotechnical Commission (IEC):
 - a. 61800 – Adjustable Speed Electrical Power Drive Systems
 - 3. National Electrical Manufacturer's Association (NEMA):
 - a. ICS 6 – Industrial Control and Systems Enclosures.
 - b. ICS 7 – Industrial Control Systems Adjustable Speed Drives.
 - c. TR 1 – Transformers, Regulators, and Reactors.
 - 4. National Fire Protection Association (NFPA).
 - 5. National Electrical Code (NEC).
 - 6. Underwriters Laboratories (UL).

1.03 SUBMITTALS:

- A. Submit as specified in DIVISION 1.
- B. Includes, but not limited to, the following:
 - 1. Variable Frequency Drives:
 - a. Arrangement and outline drawings.
 - b. Bills of material.
 - c. One line, three line, and schematic diagrams.
 - d. Connection wiring diagrams, including external connections terminals.
 - e. Tabulation of VFD settings.
 - f. Communications protocol information for all data communication devices and systems.
 - g. Test reports.
 - h. Installation, operation, programming, and maintenance manuals.
 - i. Load list.
 - j. Harmonic calculations.

PART 2 - PRODUCTS

- 2.01 VARIABLE FREQUENCY DRIVES: Variable frequency drives shall be designed and constructed to conform to applicable standards and the following requirements:

SECTION 261923 - VARIABLE FREQUENCY DRIVES: continued

- A. The VFDs shall be suitable for new induction motors installed in Site indoor ambient conditions as specified in SECTION 011100.
- B. VFD power supply:
 - 1. Nominal Voltage: 480 volts, 3 phase, 60 Hz.
 - 2. Number of feeds: one per VFD.
- C. The VFDs will be supplied from the plant 480V bus and shall have a minimum short circuit current rating (SCCR) of 65kA symmetrical.
- D. Performance:
 - 1. General:
 - a. VFD shall be 6-pulse design.
 - b. Drive system shall achieve a desired output frequency (set point) with a repeatability of 0.1 percent of rated frequency of 60 Hz.
 - c. The VFD shall provide an automatic current limit feature to control motor currents during startup and provide a “soft start” torque profile for the motor-load combination. Current and torque limit adjustments shall be provided to limit the maximum VFD output current and the maximum torque produced by the motor. These limits shall govern the inner loop torque regulator to provide tight conformance with the limits with minimum overshoot.
 - i. The VFD shall be capable of 100% rated current in continuous operation, in accordance with the requirements of NEC Table 430-150.
 - j. The VFD one-minute overload current rating shall be 110% of rated current for variable torque applications.
 - k. The VFD shall be capable of providing rated output from 0 percent speed to operating speed for continuous voltage deviations of +10% and – 5%.
 - l. The VFD shall be able to ride through voltage dips down to 15% of nominal, such as those experienced during motor starting.
 - d. The VFD system shall be capable of continuous operation in the event of a power loss of 2 seconds or less.
 - i. The VFD shall be able to return to normal operation following an incoming power disturbance that falls within the range determined by Figure 3-2 in IEEE 1100.
 - j. The VFD shall be capable of producing a variable AC voltage/frequency output to provide continuous operation over the speed range of 0 to 100%. The VFD must be capable of sustained operation at 10% speed to facilitate checkout and maintenance of the driven equipment. As a commissioning and troubleshooting feature, the VFD power circuit shall be capable of operating without a motor connected to the VFD output.
 - 2. Safety:
 - a. The safety of the operating, maintenance, and service personnel shall be considered as the most important design criteria.
 - b. The doors (except giving access to LV control equipment) shall not be capable of being opened with the main power connected to the VFD.
 - 3. Reliability:
 - a. Trouble free operation, reliability, and availability of the equipment shall be given priority.
 - b. VFD and VFD system components shall have component redundancy to improve equipment reliability.
 - 4. Efficiency:

SECTION 261923 - VARIABLE FREQUENCY DRIVES: continued

- a. Guaranteed minimum total VFD system efficiency (η_{sys}) shall be a minimum 96.5% at 100% speed and 100% load and minimum 96% at 60% speed and 21.6% load.
- b. VFD system efficiency shall be calculated by multiplying the individual efficiencies of the system components together and shall include input transformer, harmonic filter, power factor correction (if applicable), VFD converter, and output filter.
5. Input power quality:
 - a. The VFD shall comply with the latest revision of IEC 61800-3 total harmonic current and voltage distortion measurement and calculation. Total harmonic distortion shall not exceed 5%.
 - b. Actual distortion shall be measured when the equipment is installed and energized. If distortion is in excess of the IEC 61800-3 limits, the Supplier shall be responsible for reducing distortion to the required values at Supplier's own expense.
 - c. The total power factor at the VFD input shall not be less than 0.95, for the load range of 20 to 100%. The VFD, including power factor correction and/or harmonic filter, shall never have a leading power factor.
 - d. The VFD converter section shall be 6-pulse with line-side passive filter to reduce .
6. Motor Compatibility:
 - a. VFD system shall provide an output waveform that will allow utilization of the motor without need of any special insulation or de-rating. Motor life expectancy should not be compromised in any way by operation with the VFD system. The VFD must provide motor overload protection in any operating condition.
 - b. VFD output waveform shall be suitable for operating a standard induction motor without de-rating or requiring additional service factor. To ensure that there are no problems with motor heating, the VFD output current waveform, as measured at the motor, shall be inherently sinusoidal at all speeds, with a total harmonic current distortion not exceeding 3%, of the motor rated current, between +10 to +100% speed regardless of loading. VFD's utilizing output transformers are not acceptable.
 - c. The system design shall not have any inherent output harmonic resonance in the operating speed range.
 - d. The VFD shall inherently protect motor from high-voltage $\delta v/\delta t$ stress, independent of cable length to motor. VFD shall not require nonstandard insulation systems or insulation ratings above the VFD output voltage rating.
7. Protection Functions:
 - a. An Emergency-stop (E-stop) shall be provided on the VFD door in addition to inputs for Company-supplied E-Stop signals.
 - b. The VFD shall provide input phase loss protection.
 - c. The following protection functions shall be available:
 1. Motor winding or motor phase to phase short circuit.
 2. Motor ground fault protection.
 3. Motor current unbalance.
 4. Motor overcurrent.
 5. Motor over- and underload.
 6. Motor overvoltage.
 7. Motor over-torque.
 8. VFD over-temperature.
8. Controls:

SECTION 261923 - VARIABLE FREQUENCY DRIVES: continued

- a. Each VFD shall be designed to operate in accordance with DIVISION 23 specifications.
 - b. Each VFD shall include the following basic operating adjustments:
 1. Acceleration Time.
 2. Deceleration time.
 3. Current Limit.
 4. Minimum frequency or speed.
 5. Maximum frequency or speed.
 6. Selectable skip frequencies.
 - c. Each VFD shall be equipped with a front mounted operator control panel consisting of a back lighted alphanumeric display and a keypad with the following functions:
 1. Local Run / Stop command.
 2. Local / Remote selection.
 3. Increase / Decrease speed function.
 4. Display and adjustment of drive parameters.
 5. Display and reset drive faults / alarms.
 6. Display actual drive parameters (e.g. actual speed, actual current) in addition to setpoints.
 - d. Parameter names, fault / alarm messages and other information shall be displayed in plain text to allow the user to understand what is being displayed. The language on the panel shall be English.
 - e. Password protection shall be provided for security against unauthorized parameter access.
 - f. Provide a sequence of events recorder for troubleshooting fault conditions.
 - g. The VFDs for HVAC application shall be controlled solely using protocol on the Direct Digital Control (DDC) system. All indication and control shall be available via communications protocol to provide full functionality of the VFD.
 - h. The VFD alarm contact shall be closed during normal operation and shall open for the following fault conditions:
 1. Control Power Loss.
 2. VFD Failure.
 3. DC Bus Overvoltage or Undervoltage.
 4. Motor Over-temperature.
 5. Motor Overspeed.
 6. Data Network Failure.
9. Bypass:
- a. Each VFD for HVAC application shall include a fully-rated bypass contactor with the following:
 1. 120V control power transformer with two (2) primary leads and (1) secondary lead fused.
 2. Drive/bypass selector switch.
 3. Hand/Off/Auto selector switch.
 4. DDC indication when running in bypass.
 5. Thermal overload relay.
- E. Construction:

SECTION 261923 - VARIABLE FREQUENCY DRIVES: continued

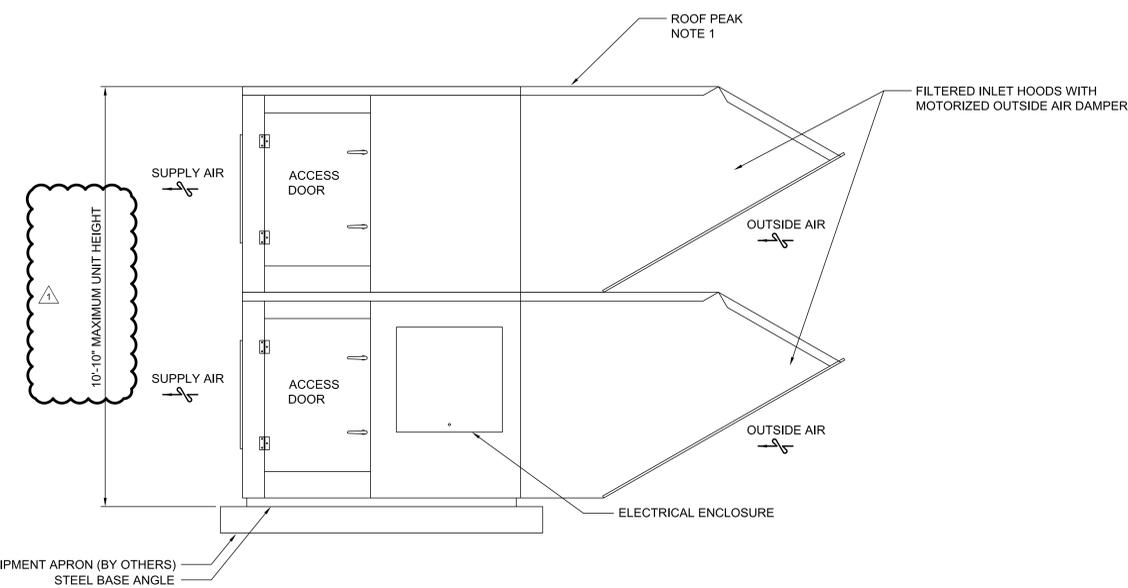
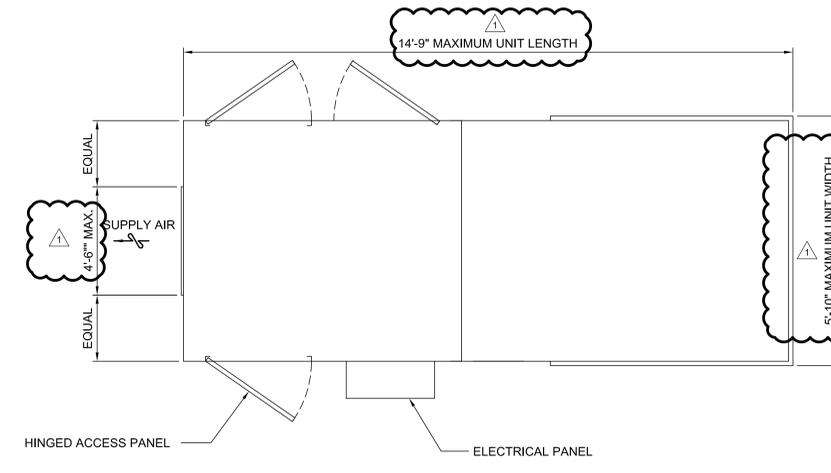
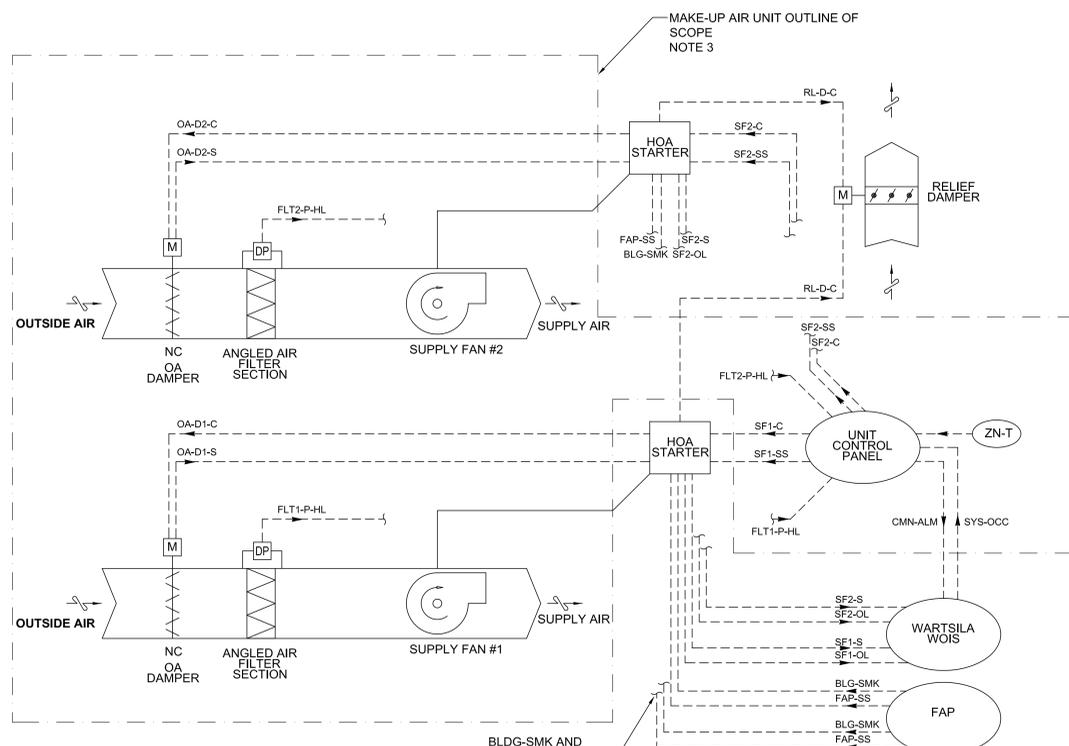
1. VFD system components shall be enclosed in NEMA 1 or NEMA 12 cabinets (unless specified elsewhere) with gaskets and filters and shall be designed for top cable entry. The filters shall be washable and corrosion resistant media. Filters shall be front replaceable while each VFD is in operation without exposing maintenance personnel to any of the power components.
2. The cabinet must be designed to avoid harmonic and inductive heating and eliminate radio frequency interference.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Coordinate installation with other trades.
- B. Contractor shall furnish, install, test, and balance VFDs with their driven equipment.
- C. Coordinate all aspects with plant DDC system controls.
- D. Perform uncoupled and coupled runs of driven equipment.
- E. Complete final inspection of VFD and driven equipment after completed runs of the HVAC systems and cranes.

END OF SECTION 261923



- NOTES:**
1. ROOF MUST BE SLOPED TO PREVENT MOISTURE ACCUMULATION. CHARGE AIR UNIT SHALL BE MOUNTED LEVEL.
 2. STARTER AND H-O-A SWITCH SHALL BE PROVIDED BY OTHERS AND LOCATED REMOTELY.
 3. ALL CONTROL ITEMS WITHIN OUTLINE OF SCOPE SHALL BE PROVIDED BY UNIT MANUFACTURER.

MAKE-UP AIR UNIT SCHEDULE (MAU)	
OUTDOOR UNITS (SPECIFICATION 237434)	
TAG NO.	MAU-P-1A, MAU-P-2A, MAU-P-3A
QUANTITY OF UNITS TO BE PROVIDED	3
FUNCTION	AUXILIARY-SIDE (WEST) ENGINE HALL VENTILATION
ARRANGEMENT	VERTICALLY STACKED HORIZONTAL
TYPE / ARRANGEMENT	DRAW THROUGH
SERVICE	CONSTANT VOLUME
ALTITUDE (FT)	1,000
TOTAL AIRFLOW	35,000
FAN/MOTOR QUANTITY PER UNIT	2
FAN (EACH)	PLENUM / AF OR FORWARD CURVED
DRIVE TYPE	BELT
MINIMUM STATIC EFFICIENCY	40%
SUPPLY AIRFLOW (CFM)	17,500
OUTSIDE AIRFLOW (CFM)	17,500
EXTERNAL STATIC PRESS. (IN WC)	0.4
TOTAL STATIC PRESS. (IN WC)	NOTE 1
MOTOR (EACH)	
MOTOR POWER (HP)	10
MOTOR RPM	1800
MOTOR TYPE	TEFC-PE
ELECTRICAL DATA (V/PH/Hz)	460 / 3 / 60
FILTERS	PRE-FILTER
EFFICIENCY	MERV 8
REMARKS	1,2,3,4,5

- NOTES:**
1. PRESSURE DROPS ASSOCIATED WITH FILTERS, DAMPERS, ETC. SHALL BE INCLUDED IN THE TOTAL INTERNAL STATIC CALCULATION BY THE UNIT MANUFACTURER.
 2. PROVIDE WITH UNIT MOUNTED DISCONNECT AND CONTROL PANEL.
 3. ALL MAKE-UP AIR UNITS SHALL BE THE SAME MANUFACTURER.
 4. STARTER AND H-O-A PROVIDED BY OTHERS.
 5. MOTORS SHALL BE NON-OVERLOADING ACROSS ENTIRE FAN CURVE.

SYSTEM: MAU-P-1A, -2A, -3A SEQUENCE OF OPERATION

- A. HAND-OFF-AUTO SWITCH:** SUPPLY FAN MOTOR STARTER SHALL ACCEPT A FIRE ALARM PANEL SIGNAL (FAP-SS OR BLG-SMK) THAT TAKES PRECEDENCE OVER ALL OTHER STARTER INPUTS AND SWITCHES AND SHALL START THE FAN (FAP-SS) OR STOP THE FAN (BLG-SMK). EACH SUPPLY FAN MOTOR STARTER SHALL HAVE AN H-O-A SWITCH:
- (1) HAND: WITH THE H-O-A SWITCH IN HAND POSITION, THE SUPPLY AIR DAMPER SHALL OPEN, THE RELIEF DAMPER SHALL OPEN, AND THE SUPPLY FAN SHALL START AND RUN CONTINUOUSLY, SUBJECT TO SAFETIES.
 - (2) OFF: WITH THE H-O-A SWITCH IN OFF POSITION, THE SUPPLY FAN SHALL STOP, THE RELIEF AIR DAMPER SHALL BE CLOSED AND THE SUPPLY AIR DAMPER SHALL BE CLOSED.
 - (3) AUTO: WITH THE H-O-A SWITCH IN AUTO POSITION, THE SUPPLY FAN SHALL RUN (AND THE OUTSIDE AIR & RELIEF AIR DAMPERS SHALL BE CONTROLLED) SUBJECT TO THE SUPPLY FAN START/STOP (SF-SS) COMMAND AND SAFETIES.
- B. OCCUPANCY MODES:** THE SYSTEM SHALL OBTAIN ITS OCCUPANCY MODE INPUT FROM THE WARTSILA WOIS. THE SYSTEM SHALL OPERATE IN ONE OF THE FOLLOWING MODES:
- (1) OCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE OCCUPIED MODE WHEN A COMMAND TO START INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
 - (2) UNOCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE UNOCCUPIED MODE WHEN A COMMAND TO STOP INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
- C. SYSTEM ENABLE AND LOOP ENABLE**
- (1) OCCUPIED MODE: THE UNIT CONTROLLER SHALL OPERATE THE SUPPLY FANS IN A LEAD/LAG CONFIGURATION AND ROTATE THE LEAD FAN BASED ON RUN-TIME. WHEN ONE OR BOTH SUPPLY FANS ARE ENABLED AND COMMANDED TO RUN (SF1-SS AND/OR SF2-SS) THE RESPECTIVE OUTSIDE AIR DAMPER SHALL BE OPEN, AND THE RELIEF AIR DAMPER SHALL BE OPEN. IN OCCUPIED MODE, THE FAN LEAD-LAG CONTROL LOOP SHALL BE ENABLED.
 - (2) UNOCCUPIED MODE: ALL CONTROL LOOPS SHALL BE DISABLED. THE SUPPLY AIR DAMPER SHALL BE CLOSED, THE RELIEF AIR DAMPER SHALL BE CLOSED AND THE SUPPLY FAN SHALL BE OFF.
- D. PROOFS AND SAFETIES**
- (1) THE SUPPLY FAN AND ALL CONTROL LOOPS SHALL BE SUBJECT TO PROOFS AND SAFETIES. STARTER SAFETIES SHALL BE DIRECT-HARDWARE INTERLOCKED. CONTROL PANEL SHALL MONITOR ALL SAFETIES AND ACTIVATION OF ANY SAFETY SHALL RESULT IN ALL CONTROL LOOPS BEING DISABLED AND THE SUPPLY FAN BEING COMMANDED OFF UNTIL RESET.
 - (2) PROOFS:
 - (A) SUPPLY FAN #1 STATUS (SF1-S).
 - (B) SUPPLY FAN #2 STATUS (SF2-S).
 - (C) SUPPLY FAN #1 OVERLOAD (SF1-OL).
 - (D) SUPPLY FAN #2 OVERLOAD (SF2-OL).
 - (E) OUTSIDE AIR DAMPER #1 STATUS (OA-D1-S).
 - (F) OUTSIDE AIR DAMPER #2 STATUS (OA-D2-S).
 - (3) SAFETIES:
 - (A) BUILDING SMOKE DETECTION (BLG-SMK).
 - (B) HE UNIT SHALL RUN SUBJECT TO ALL THE UNIT MANUFACTURER'S SAFETIES.
 - (C) HARDWARE RESET OF SAFETIES SHALL BE VIA THE LOCAL CONTROL PANEL.
- E. FAN LEAD-LAG CONTROL LOOP:** WHEN THIS LOOP IS ENABLED, THE CONTROL HARDWARE SHALL COMMAND THE FAN S TO START AND STOP (SF-SS) IN A LEAD-LAG SEQUENCE TO CONTROL ZONE VENTILATION TEMPERATURE (ZN-T) AT SETPOINT (ZN-T-SP). WHEN THIS LOOP IS DISABLED, THE CONTROL HARDWARE SHALL STOP THE FANS.

FUNCTION	NAME	DESCRIPTION	SETTINGS WITH UNITS	RANGE WITH UNITS	I/O TYPE (NOTE 6)	ALARM CONDITION	WIRING PROVIDED UNDER CONTRACT	REMARKS
CONTROL FUNCTIONS: UNIT CONTROL PANEL								
PROOFS AND SAFETIES		UNIT MANUFACTURER'S SAFETIES	--	ALARM/NORMAL	NOTE 3	ALARM	C4440	--
START/STOP	SY-S-OCC	OCCUPANCY INPUT FROM WARTSILA WOIS	--	ON/OFF	BI	--	C8410	--
	SF1-SS	SUPPLY FAN 1 START/STOP	--	ON/OFF	BO	--	C8410	--
	SF2-SS	SUPPLY FAN 2 START/STOP	--	ON/OFF	BO	--	C8410	--
SUPPLY FAN CONTROL	ZN-T	ZONE TEMPERATURE	--	0 - 120 DEG F	BI	--	C8410	NOTE 2
	ZN-T-SP	ZONE TEMPERATURE SETPOINT	90 DEG F	50 - 100 DEG F	--	--	C4440	NOTE 1
OTHER POINTS	FLT1-P-HL	FILTER #1 PRESSURE HIGH LIMIT SWITCH	0.70 IN WC	ALARM/NORMAL	BI	ALARM	C4440	NOTE 1
	FLT2-P-HL	FILTER #2 PRESSURE HIGH LIMIT SWITCH	0.70 IN WC	ALARM/NORMAL	BI	ALARM	C4440	NOTE 1
	CMN-ALM	COMMON ALARM	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
CONTROL FUNCTIONS: STARTER								
PROOFS AND SAFETIES	SF1-S	SUPPLY #1 FAN STATUS	--	ON/OFF	BO	PROOF FAILED (NOTE 4)	C8410	--
	SF2-S	SUPPLY #2 FAN STATUS	--	ON/OFF	BO	PROOF FAILED (NOTE 4)	C8410	--
	SF1-OL	SUPPLY #1 FAN OVERLOAD	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
	SF2-OL	SUPPLY #2 FAN OVERLOAD	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--
	BLG-SMK	BUILDING SMOKE DETECTION	--	ALARM/NORMAL	BI	ALARM (NOTE 5)	C8410	--
START/STOP	FAP-SS	FIRE ALARM PANEL EMERGENCY START	--	ON/OFF	BI	--	C8410	--
OTHER POINTS	OA-D1-C	OUTSIDE AIR DAMPER #1 COMMAND	--	OPEN/CLOSED	BO	--	C4440	NOTE 4
	OA-D1-S	OUTSIDE AIR DAMPER #1 STATUS	--	OPEN/CLOSED	BI	--	C4440	--
	OA-D2-C	OUTSIDE AIR DAMPER #2 COMMAND	--	OPEN/CLOSED	BO	--	C4440	--
	OA-D2-S	OUTSIDE AIR DAMPER #2 STATUS	--	OPEN/CLOSED	BI	--	C4440	--
	RL-D-C	RELIEF AIR DAMPER COMMAND	--	OPEN/CLOSED	BO	--	C8410	NOTE 7

- NOTES:**
1. ALL SETPOINTS SHALL BE ADJUSTABLE.
 2. ZONE TEMPERATURE SENSOR SHARED WITH GENERATOR SIDE MAU SERVING SAME ENGINE.
 3. INTERNAL TO MANUFACTURER'S CONTROL SYSTEM.
 4. ALARM GENERATED BY WARTSILA WOIS.
 5. ALARM GENERATED BY FIRE ALARM PANEL (FAP).
 6. IO TYPE WITH RESPECT TO UNIT CONTROL PANEL OR STARTER AS INDICATED.
 7. DAMPER SHALL BE HARD WIRED FROM STARTER.
- ABBREVIATIONS AND ACRONYMS**
- | | | | | | |
|---|----------|----|---------------|----|---|
| - | N/A | AI | ANALOG INPUT | PI | PROPORTIONAL-INTEGRAL CONTROL |
| X | REQUIRED | AO | ANALOG OUTPUT | BI | GENERATOR MANUFACTURER'S CONTROL SYSTEM |
| | | BO | BINARY OUTPUT | | |

COPYRIGHT © 2015 BURNS & MCDONNELL ENGINEERING COMPANY, INC.

no.	date	by	ckd	description	no.	date	by	ckd	description
1	04/29/15	RW	BN	CONFORMED FOR CONTRACT					
0	02/16/15	RW	BN	ISSUED FOR BID					



9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. CA-421
06/30/16

COFFEYVILLE GENERATION FACILITY 2
POWER BLOCK BUILDING
AUXILIARY SIDE
MAKE-UP AIR UNIT DETAILS

project 81799 contract C4440

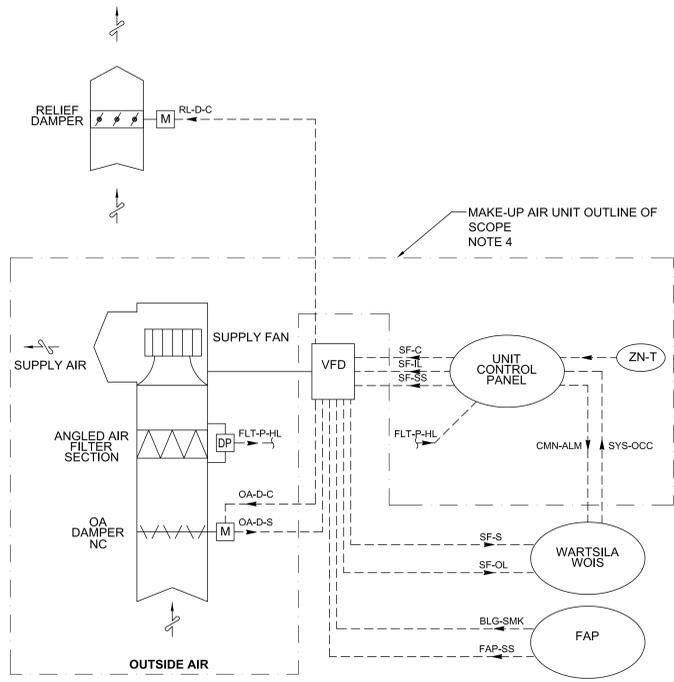
drawing MH801 rev. 1

sheet of sheets

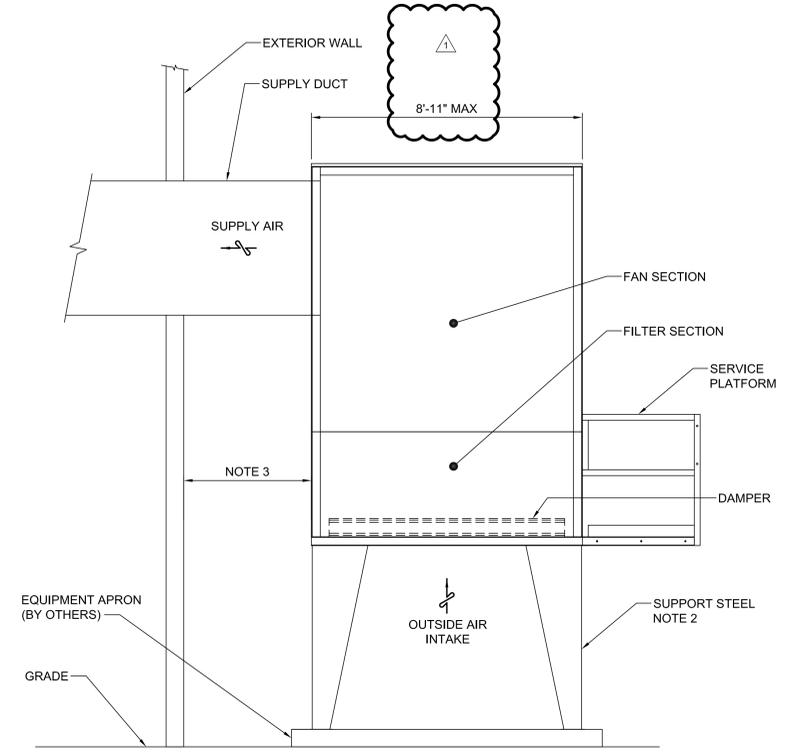
file 75644_MH801.DWG

designed R. WEAVER

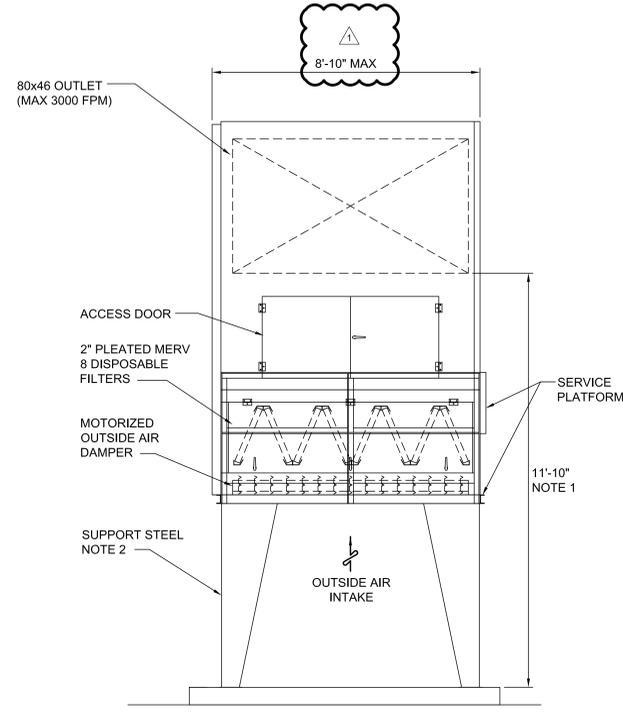
detailed R. WEAVER



MAU-P-1B, -2B, -3B
CONTROL SCHEMATIC
NOT TO SCALE



SIDE VIEW: MAU-P-xB
SCALE IN FEET



ELEVATION VIEW: MAU-P-xB
SCALE IN FEET

- NOTES:**
- BOTTOM OF SUPPLY AIR OUTLET SHALL BE LOCATED BETWEEN 10'-0" and 12'-6" AFF.
 - MAU-P-xB SHALL BE SUPPORTED BY FULL STEEL FRAME OR STEEL LEGS. REFER TO SPECIFICATION FOR REQUIREMENTS.
 - UNIT WILL BE LOCATED 24 INCHES FROM BUILDING WALL. MANUFACTURER'S DESIGN OF REQUIRED SUPPORT FRAME/LEG HEIGHT SHALL ONLY INCLUDE THREE SIDES FOR INTAKE AIRFLOW.
 - ALL CONTROL ITEMS WITHIN OUTLINE OF SCOPE SHALL BE PROVIDED BY THE MANUFACTURER.

MAKE-UP AIR UNIT SCHEDULE (MAU)	
OUTDOOR UNITS (SPECIFICATION 237433)	
TAG NO.	MAU-P-1B, MAU-P-2B, MAU-P-3B
QUANTITY OF UNITS TO BE PROVIDED	3
FUNCTION	GENERATOR-SIDE (EAST) ENGINE HALL VENTILATION
ARRANGEMENT	VERTICAL UPFLOW
TYPE / ARRANGEMENT	DRAW THROUGH
SERVICE	VARIABLE VOLUME
ALTITUDE (FT)	1,000
TOTAL AIRFLOW	70,000
FAN/MOTOR QUANTITY PER UNIT	1
FAN	PLENUM / AIR FOIL
DRIVE TYPE	BELT
MINIMUM STATIC EFFICIENCY	40%
SUPPLY AIRFLOW (CFM)	70,000
OUTSIDE AIRFLOW (CFM)	70,000
EXTERNAL STATIC PRESS. (IN WC)	0.4
TOTAL STATIC PRESS. (IN WC)	NOTE 1
MOTOR	
MOTOR POWER (HP)	30
MOTOR RPM	1800
MOTOR TYPE	TEFC-PE
ELECTRICAL DATA (V/PH/Hz)	460 / 3 / 60
FILTERS	PRE-FILTER
EFFICIENCY	MERV 8
REMARKS	1,2,3,4

- NOTES:**
- PRESSURE DROPS ASSOCIATED WITH FILTERS, DAMPERS, ETC. SHALL BE INCLUDED IN THE TOTAL INTERNAL STATIC CALCULATION BY THE UNIT MANUFACTURER.
 - PROVIDE WITH UNIT MOUNTED DISCONNECT AND CONTROL PANEL.
 - ALL MAKE-UP AIR UNITS SHALL BE THE SAME MANUFACTURER.
 - PROVIDE WITH REMOTE MOUNTED VFD DRIVE.

**SYSTEM: MAU-P-1B, -2B, -3B
SEQUENCE OF OPERATION**

- UNLESS OTHERWISE SPECIFIED, ALL MODULATING CONTROL SHALL BE PROPORTIONAL-INTEGRAL (PI) CONTROL.
- A. HAND-OFF-AUTO SWITCH:**
SUPPLY FAN VARIABLE FREQUENCY DRIVE (VFD) UNIT SHALL ACCEPT A FIRE ALARM PANEL SIGNAL (FAP-SS OR BLG-SMK) THAT TAKES PRECEDENCE OVER ALL OTHER VFD INPUTS AND SWITCHES AND SHALL CAUSE THE VFD TO RUN AT 100% SPEED (FAP-SS) OR 0% SPEED (BLG-SMK). THE SUPPLY FAN VARIABLE FREQUENCY DRIVE (VFD) UNIT SHALL HAVE AN INTEGRAL H-O-A SWITCH:
 (1) HAND: WITH THE H-O-A SWITCH IN HAND POSITION, THE SUPPLY AIR DAMPER SHALL BE OPEN, THE RELIEF AIR DAMPER SHALL BE OPEN, AND THE SUPPLY FAN SHALL START AND RUN CONTINUOUSLY, SUBJECT TO SAFETIES. FAN SPEED SHALL BE UNDER MANUAL-OPERATOR CONTROL.
 (2) OFF: WITH THE H-O-A SWITCH IN OFF POSITION, THE SUPPLY FAN SHALL STOP, THE RELIEF AIR DAMPER SHALL BE CLOSED AND THE SUPPLY AIR DAMPER SHALL BE CLOSED.
 (3) WITH THE H-O-A SWITCH IN AUTO POSITION, THE SUPPLY FAN SHALL RUN (AND THE OUTSIDE AIR & RELIEF AIR DAMPERS SHALL BE CONTROLLED) SUBJECT TO THE SUPPLY FAN START/STOP SIGNAL (SF-SS) AND SAFETIES. FAN SPEED SHALL BE UNDER CONTROL OF THE UNIT CONTROL PANEL.
- B. OCCUPANCY MODES:** THE SYSTEM SHALL OBTAIN ITS OCCUPANCY MODE INPUT FROM THE WARTSILA WOIS. THE SYSTEM SHALL OPERATE IN ONE OF THE FOLLOWING MODES:
 (1) OCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE OCCUPIED MODE WHEN A COMMAND TO START INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
 (2) UNOCCUPIED: THE UNIT CONTROL PANEL SHALL BE IN THE UNOCCUPIED MODE WHEN A COMMAND TO STOP INPUT IS RECEIVED FROM THE WARTSILA WOIS (SYS-OCC).
- C. SYSTEM ENABLE AND LOOP ENABLE**
 (1) OCCUPIED MODE: THE OUTSIDE AIR DAMPER SHALL BE OPEN, THE RELIEF AIR DAMPER SHALL BE OPEN, AND THE SUPPLY FAN SHALL BE ENABLED. THE FAN CAPACITY CONTROL LOOP SHALL BE ENABLED.
 (2) UNOCCUPIED MODE: ALL CONTROL LOOPS SHALL BE DISABLED. THE OUTSIDE AIR DAMPER SHALL BE CLOSED, THE RELIEF AIR DAMPER SHALL BE CLOSED, AND THE SUPPLY FAN SHALL BE OFF.
- D. PROOFS AND SAFETIES**
 (1) THE SUPPLY FAN AND ALL CONTROL LOOPS SHALL BE SUBJECT TO PROOFS AND SAFETIES. VFD SAFETIES SHALL BE DIRECT-HARDWIRED INTERLOCKED. CONTROL PANEL SHALL MONITOR ALL SAFETIES AND ACTIVATION OF ANY SAFETY SHALL RESULT IN ALL CONTROL LOOPS BEING DISABLED AND THE SUPPLY FAN BEING COMMANDED OFF UNTIL RESET.
 (2) PROOFS:
 (A) SUPPLY FAN STATUS (SF-S)
 (B) SUPPLY FAN OVERLOAD (SF-OL)
 (C) OUTSIDE AIR DAMPER STATUS (OA-D-S)
 (3) SAFETIES:
 (A) BUILDING SMOKE DETECTION (BLG-SMK)
 (B) THE UNIT SHALL RUN SUBJECT TO ALL THE UNIT MANUFACTURER'S SAFETIES.
 (C) UNIT DISCONNECT (SF-IL). INTERLOCK PREVENTS OPERATION OF VFD WHEN UNIT DISCONNECT IS OPEN.
 (D) HARDWARE RESET OF ALL SAFETIES SHALL BE VIA THE LOCAL CONTROL PANEL.
- E. FAN CAPACITY CONTROL LOOP:** WHEN THIS LOOP IS ENABLED, THE CONTROL HARDWARE SHALL COMMAND THE FAN TO START (SF-SS) AND MODULATE THE SUPPLY FAN VARIABLE FREQUENCY DRIVE UNIT TO MAINTAIN THE ZONE VENTILATION TEMPERATURE (ZN-T) AT SETPOINT (ZN-T-SP). WHEN THIS LOOP IS DISABLED, THE CONTROL HARDWARE CAPACITY MODULATION OUTPUT TO THE VFD SHALL BE ZERO PERCENT.

MAU-P-1B, -2B, -3B POINTS SCHEDULE											
FUNCTION	NAME	DESCRIPTION	SETTINGS WITH UNITS	RANGE WITH UNITS	IO TYPE (NOTE 6)	ALARM CONDITION	WIRING PROVIDED UNDER CONTRACT	REMARKS			
CONTROL FUNCTIONS: UNIT CONTROL PANEL											
PROOFS AND SAFETIES	SF-IL	SUPPLY FAN INTERLOCK	--	ON/OFF	BO	--	C8410	NOTE 9			
	SYS-OCC	UNIT MANUFACTURER'S SAFETIES	--	ALARM/NORMAL	NOTE 3	ALARM	C4440	--			
START/STOP	SF-SS	OCCUPANCY INPUT FROM WARTSILA WOIS	--	OCC/UNOCC	BI	--	C8410	--			
	SF-SS	SUPPLY FAN START STOP	--	ON/OFF	BO	--	C8410	--			
SUPPLY FAN	ZN-T	ZONE TEMPERATURE	--	0 - 120 DEG F	BI	--	C8410	NOTE 2			
CAPACITY CONTROL	ZN-T-SP	ZONE TEMPERATURE SETPOINT	80 DEG F	50 - 100 DEG F	--	--	C4440	NOTE 1			
	SF-C	SUPPLY FAN COMMAND	--	0-100%	AO	--	C8410	--			
OTHER POINTS	FLT-P-HL	FILTER PRESSURE HIGH LIMIT SWITCH	0.70 IN WC	ALARM/NORMAL	BI	ALARM	C4440	NOTE 1			
	CMN-ALM	COMMON ALARM	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--			
CONTROL FUNCTIONS: VARIABLE FREQUENCY DRIVE											
PROOFS AND SAFETIES	SF-S	SUPPLY FAN STATUS	--	ON/OFF	BO	PROOF FAILED (NOTE 4)	C8410	--			
	SF-OL	SUPPLY FAN OVERLOAD	--	ALARM/NORMAL	BO	ALARM (NOTE 4)	C8410	--			
START/STOP	BLG-SMK	BUILDING SMOKE DETECTION	--	ALARM/NORMAL	BI	ALARM (NOTE 5)	C8410	--			
	FAP-SS	FIRE ALARM PANEL EMERGENCY START	--	ON/OFF	BI	--	C8410	--			
OTHER POINTS	OA-D-C	OUTSIDE AIR DAMPER COMMAND	--	OPEN/CLOSED	BO	--	C4440	NOTE 7			
	OA-D-S	OUTSIDE AIR DAMPER STATUS	--	OPEN/CLOSED	BI	--	C4440	NOTE 7			
	RL-D-C	RELIEF AIR DAMPER COMMAND	--	OPEN/CLOSED	BO	--	C8410	NOTE 7			
ABBREVIATIONS AND ACRONYMS											
NOTES:			1. ALL SETPOINTS SHALL BE ADJUSTABLE			N/A			AI ANALOG INPUT		
2. ZONE TEMPERATURE SENSOR SHARED WITH AUXILIARY SIDE MAU SERVING SAME ENGINE.			X			REQUIRED			AI ANALOG OUTPUT		
3. INTERNAL TO MANUFACTURER'S CONTROL SYSTEM.									BI BINARY INPUT		
4. ALARM GENERATED BY WARTSILA WOIS									BO BINARY OUTPUT		
5. ALARM GENERATED BY FIRE ALARM PANEL (FAP).									PI PROPORTIONAL-INTEGRAL CONTROL		
6. IO TYPE WITH RESPECT TO UNIT CONTROL PANEL OR VFD AS INDICATED.									WOIS GENERATOR MANUFACTURER'S CONTROL SYSTEM		
7. DAMPER SHALL BE HARD WIRED FROM VFD.											
8. NOT USED											
9. INTERLOCK GENERATED FROM CONTROL PANEL OR RELAY WITHIN UNIT.											

COPYRIGHT © 2015 BURNS & MCDONNELL ENGINEERING COMPANY, INC.

no.	date	by	ckd	description	no.	date	by	ckd	description
1	04/29/15	RW	BN	CONFORMED FOR CONTRACT					
0	02/16/15	RW	BN	ISSUED FOR BID					

 9400 WARD PARKWAY KANSAS CITY, MO 64114 816-333-9400 FIRM LICENSE NO. CA-421 06/30/16		COFFEYVILLE GENERATION FACILITY 2 POWER BLOCK BUILDING GENERATOR SIDE MAKE-UP AIR UNIT DETAILS	
project	81799	contract	C4440
drawing	MH802 - 1		rev.
sheet	of	sheet	
file	75644_MH802.DWG		
designed	R. WEAVER	detailed	R. WEAVER