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), Monday, February 9, 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 #21–14/15
C5310 – 13,800-Volt and 480-Volt Switchgear

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 Ryan Easterling, Energy Group, Burns & McDonnell Engineering Co., Inc., at (630) 724-3200, office, or (630) 724-3299, direct, or email reasterling@burnsmcd.com.

BID PACKET
FOR

C5310 – 13,800-Volt and 480-Volt Switchgear

Stillwater Electric Utility

A Division of
Stillwater Utilities Authority

SUA Bid #21-14/15

January 14, 2015

Bid Opening Date: February 9, 2015
3:00 P.M. (CST) at City Hall
723 S. Lewis
Stillwater, OK 74074

Stillwater Utilities Authority
Power Generation Station Project
C5310 – 13,800-Volt and 480-Volt Switchgear Equipment
Burns & McDonnell Project No. 75644
Burns & McDonnell Engineering Company, Inc.
Oklahoma Certificate of Authorization No. CA-421

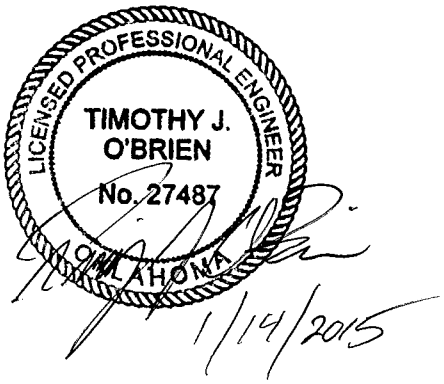
DOCUMENT 000005 - INDEX AND CERTIFICATION PAGE

SPECIFICATION INDEX

DOCUMENT / DIVISION	DESCRIPTION	NUMBER OF PAGES
1	GENERAL REQUIREMENTS	44
26	ELECTRICAL	27

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.



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August 28, 2014

Notice to Bidders

SUA Bid #21-14/15

C5310 – 13,800-Volt and 480-Volt Switchgear

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
P.O. Box 1449
Stillwater, OK 74076

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 February 9, 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 February 9, 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 middle of March, 2014.

Date: January 14, 2015

Elizabeth Chrz
Deputy City Clerk
City of Stillwater, Oklahoma

Instructions to Bidders

SUA Bid #21-14/15

C5310 – 13,800-Volt and 480-Volt Switchgear

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, Monday, February 9, 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 <u>not</u> 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 equipment 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 #21-14/15
C5310 – 13,800-Volt and 480-Volt Switchgear

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 switchgear 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 #21-14/15

C5310 – 13,800-Volt and 480-Volt Switchgear

January 14, 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 #21-14/15** 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.	One (1) single-ended lineup of 13.8kV metalclad switchgear	$
2.	One (1) main-tie-main lineup of 480-V metal-enclosed switchgear.	
3.	Transportation (DDP jobsite, Stillwater OK)	$
	Sub-Total	$
4.	Field Services as specified	$
5.	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#21-14/15. 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 #21-14/15 *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.	One (1) single-ended lineup of 13.8kV Metalclad switchgear	$
C2.	One (1) main-tie-main lineup of 480-V Metal-enclosed switchgear.	
C3.	Transportation (DDP jobsite, Stillwater OK)	$
	Sub-Total	$
C4.	Field Services for inspection, start-up, and commissioning	$
C5.	Requested Performance and Statutory Bonds	$
	BIDDER'S TOTAL PRICE	$
C6.	Option: Recommended Spare Parts for Commissioning	$
C7.	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 C7 above. If there are no savings, enter zero in A2 below and C7 above.

No.	Description	Fill in Deduct
A2.	Option: 50% of deduct for Stillwater Utilities Authority Items No. 1-2	$

The aforementioned option prices C1 through C7 & A2 are valid for _____ Days after contract award.

Data required with Bid:

No.	Description	Bidder Action
1.	Guaranteed Dates (*Commercial Terms and Conditions* Exhibit 1)	Review and confirm dates
2.	Milestone Payment & Cancellation Schedule (*Commercial Terms and Conditions* Exhibit 3)	Provide
3.	Submittals Schedule (Specifications SECTION 013301, Appendix A)	Provide data requested “With Bid”

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.	
8.	
9.	
10.	

SIGNATURE REQUIRED ON NEXT PAGE

Submitted By:

Bidder:_____

Company:_____

Address:_____

E-Mail Address:_____@_____

Phone:_____Fax_____

Authorized Signature:_____

Date:_____

Non-Collusion Affidavit

Stillwater Utilities Authority

STATE OF OKLAHOMA)
) ss
COUNTY OF PAYNE)

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

1. (S)He is the duly authorized agent of _____, 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.

_____
(Company Name)

_____
PRESIDENT

This instrument was subscribed, acknowledged, and sworn to before me this ____day of _____, 20__, by _____, the person signing above, as the above-named Supplier's duly authorized agent.

_____
Notary Public

My Commission Expires:_____
My Commission No.: _____

STILLWATER UTILITIES AUTHORITY
SUA Bid #21-14/15
C5310 – 13,800-Volt and 480-Volt Switchgear

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.

Certificate of Non-Discrimination

Stillwater Utilities Authority

In connection with the performance of Work under this Contract, the Supplier agrees as follows:

A. The Supplier agrees not to discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, ancestry, age or physical disability. The Supplier shall take affirmative action to insure that employees are treated without regard to their race, creed, color, national origin, sex, or ancestry. Such actions shall include, but not be limited to the following: Employment, upgrading, demotion or transfer, recruiting or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. The Supplier and Subcontractor shall agree to post in a conspicuous place, available to employees and applicants for employment, notices to be provided by the Owner setting forth provisions of this section.

B. In the event of the Supplier's non-compliance with this non-discrimination clause, the Contract may be canceled or terminated by the Owner. The Owner may declare the Supplier ineligible for further Contracts with the said agency until satisfactory proof of intent to comply shall be made by the Supplier.

C. The Supplier agrees to include this non-discrimination clause in any Subcontracts connected with the performance of this Agreement.

I have read the above stated clause and agree to abide by its requirements.

_____
(Company Name)

_____
PRESIDENT

(Seal)

_____
Secretary

STATE OF OKLAHOMA)
) ss:
COUNTY OF PAYNE)

On this _____ day of _____, 20__, before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared _____, to me known to be the identical person who signed the name of the maker thereof to the within and foregoing instrument as its _____ and acknowledged to me that ____ executed the same as _____ free and voluntary act and deed, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and seal the day and year last above written.

_____
Notary Public

My Commission Expires:_____
My Commission No.: _____

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

C5310 – 13,800-Volt and 480-Volt Switchgear
SUA Bid #21-14/15

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, 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 #21-14/15 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 OKLAHOMA)

COUNTY OF PAYNE)

_____ , 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 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 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 #21-14/15 _____

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

Ref. Bid No. SUA #21-14/15

Attachment A

Commercial Terms and Conditions

ATTACHMENT A

COMMERCIAL TERMS & CONDITIONS

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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; and (b) Owner has formally accepted all the Goods; and (c) Supplier has completed all field service required by the Contract documents.

"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, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the 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 an eighteen (18) month period starting the date on which the Goods are delivered to the Site.

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	$2,000/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. NOT USED

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
One (1) 13,800-Volt Metal-clad Switchgear	January 21, 2016	January 28, 2016
One (1) 480-Volt Metal-enclosed Switchgear and bus equipment	January 21, 2016	January 28, 2016
All associated accessories and spare parts per contract.	January 21, 2016	January 28, 2016
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.

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:_____

Attachment B

Technical Specifications & Drawings

ATTACHMENT B
SPECIFICATIONS & DRAWINGS

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0	Appendix C	Submittal Description	1
0	Appendix D	Typical Instruction Book Cover or Operating Manual Cover and Spine Layout	1
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CONTRACT DRAWINGS

Drawing No.	Rev	Drawing Title
EE101	0	One Line Diagram 13,800V Switchgear Metering and Relaying
EE102	0	One Line Diagram 13,800V Switchgear Metering and Relaying
EE103	0	One Line Diagram 13,800V Switchgear Metering and Relaying
EE105	0	One Line Diagram 480V Switchgear 00-EAP-SWG-011 & 00-EAP-SWG-012
SK-LV-F	LATER	Schematic Diagram 480V Switchgear Typ. Feeder Breaker
SK-LV-E10	LATER	Schematic Diagram 480V Switchgear Gen. Breaker E10
SK-LV-E1	LATER	Schematic Diagram 480V Switchgear Main Breaker E1
SK-LV-E2	LATER	Schematic Diagram 480V Switchgear Main Breaker E2
SK-LV-E3	LATER	Schematic Diagram 480V Switchgear Main Breaker E3
SK-LV-E4	LATER	Schematic Diagram 480V Switchgear Tie Breaker E4
SK-LV-FV	LATER	Front View 480V Switchgear
SK-MV-A-01	LATER	Schematic Diagram 13.8kV Switchgear Feeder Breaker
SK-MV-A-02	LATER	Schematic Diagram 13.8kV Switchgear Feeder Breaker
SK-MV-A-03	LATER	Schematic Diagram 13.8kV Switchgear Feeder Breaker

CONTRACT DRAWINGS

Drawing No.	Rev	Drawing Title
SK-MV-COMM	LATER	Connection Diagram 13.8kV Switchgear Communications
SK-MV-FV	LATER	Front View 13.8kV Switchgear
SK-MV-G-01	LATER	Schematic Diagram 13.8kV Generator Breaker
SK-MV-G-02	LATER	Schematic Diagram 13.8kV Generator Breaker
SK-MV-G-03	LATER	Schematic Diagram 13.8kV Generator Breaker
SK-MV-M-01	LATER	Schematic Diagram 13.8kV Main Breaker
SK-MV-M-02	LATER	Schematic Diagram 13.8kV Main Breaker
SK-MV-M-03	LATER	Schematic Diagram 13.8kV Main Breaker

REFERENCE DRAWINGS

Drawing No.	Rev	Drawing Title
E001	LATER	Electrical Legend for One Line Diagrams
E003-1	LATER	Electrical Legend for Connection Diagrams & Schematics
E003-2	LATER	Electrical Legend for Connection Diagrams & Schematics

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 Documents.

1.02 PROJECT DESCRIPTION:

A. The Project is a natural gas fired reciprocating engine power plant designed for 55±5 MW (nominal) net electric power output. Final net electric power output will be defined in the Agreement.

B. The Project Site is located at the northwest corner of Airport Road and North Jardot Road, Stillwater, Oklahoma 74075.

C. Supplier is responsible for final design including Supplier's Equipment arrangement.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. The Contract includes but is not limited to, engineering, designing, fabricating, factory testing, packaging, delivering, and providing field services for the following components of Work, which are listed for the Supplier's convenience in understanding the scope of Work:

1. One (1) single-ended lineup of 13.8kV metalclad switchgear.
2. One (1) main-tie-main lineup of 480-V metal-enclosed switchgear.

B. All Work shall be designed to meet the design data specified 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 Project Site.

1.04 WORK BY OTHERS:

A. Electrical connections between switchgear and equipment not furnished under this Contract shall be performed by Others.

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.

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
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
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
AWS	American Welding Society
DIN	German Standard (Deutsche Institute für Normung)
EJMA	Expansion Joint Manufacturer’s Association
EN	European Standard
FCI	Fluid Control Institute
HEI	Heat Exchange Institute
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
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
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 Ord 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
   - a. Maximum Dry Bulb — 120°F
   - b. Minimum Dry Bulb — 50°F
3. Outdoor Design Temperatures
   - a. Maximum Dry Bulb (1%) — 99.2°F
   - b. Mean Coincident Wet Bulb — 75.3°F
   - c. Minimum Dry Bulb (99.6%) — 13.6°F
4. Outdoor Extreme Temperatures (n = 10 years)
   - a. Maximum Dry Bulb — 110.5°F
   - b. Minimum Dry Bulb — 2.6°F
   - c. Extreme Max Wet Bulb — 88.2°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 (I_p = 1.5 under specific conditions, see ASCE 7-05 Section 13.1.3)
   - 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 = 40mph

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.

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.
   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.
   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.

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
         (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 reasterling@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:
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.
   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.
      (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.
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.

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.
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.
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

SECTION 013301 APPENDIX A
Submittal Schedule
Legend: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order or Notice to Proceed

ID	Description	Subject To LD's	With Bid (for bid evaluation and award)	For Acceptance (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 Spare Parts		E		
4	Preliminary Work Progress Schedule				E – 15 Days ARO
5	Schedule of Submittals		E	E – 15 Days ARO	
6	Detailed Manufacturing Schedule with milestones for each piece of Equipment				E – 30 Days ARO
7	Detailed drawing list with submittal dates				E – 30 Days ARO
8	Detailed commissioning work Progress Schedule				E – 60 Days prior to delivery
9	NOT USED				
10	Preliminary O&M Manuals			E – 60 Days prior to earliest Guaranteed Delivery Date	
11	Installation Manuals			E – 60 Days prior to earliest Guaranteed Delivery Date	P (4), E – 30 Days prior to earliest Guaranteed Delivery Date
12	Final O&M Manuals				P (4), E – 30 Days prior to earliest Guaranteed Delivery Date
13	Packing Lists				P (1) – With each shipment
14	Bills of Materials			E – 60 Days ARO	
15	Unloading, Handling & Storage Requirements and Procedures				P (1), E – With Notice of Shipment
16	Material Safety Data Sheets (if applicable)				P (4), E – With Notice of Shipment and with each Shipment
17	Switchgear Circuit Breaker and Trip Device Literature and Technical Information		E		
17	Equipment & Component Datasheets			E – 30 Days ARO	
18	Outline Drawings, Weights, and Front View Drawings	Y	E	E – 30 Days ARO	

Submittal Schedule

Legend: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order or Notice to Proceed

ID	Description	Subject To LD's	With Bid (for bid evaluation and award)	For Acceptance (required prior to fabrication)	For Information / Certification / Construction (conformed including Owner's and Engineer's comments)
19	Bus Duct Connection Details			E – 30 Days ARO	
20	Structural Loadings and Details	Y	E	E – 30 Days ARO	
21	One Line Diagrams	Y	E	E – 30 Days ARO	
22	Anchor Bolt and Setting, Assembly, Erection, Section Drawings	Y		E – 30 Days ARO	
23	Arc Flash Duct Drawings	Y		E – 30 Days ARO	
24	Nameplate Schedule	Y		E – 45 Days ARO	
24	Bill of Material	Y		E – 45 Days ARO	
24	Three Line Diagrams	Y		E – 45 Days ARO	
24	AC/DC Electrical Schematics	Y		E – 45 Days ARO	
25	Wiring and Interconnection Drawings	Y		E – 45 Days ARO	
26	CT Saturation Curves	Y		E – 45 Days ARO	
27	Factory Test Schedule				E– 30 Days prior to test
28	Factory Test Procedure				E–21 Days prior to test
29	Factory Test Report				E – 15 Days after test

APPENDIX B

SUBMITTAL INFORMATION BLOCK

Supplier to fill in all blanks without preprinted information

For the use of Engineer

Project Supplier Identification

Supplier: _____

Project Name: _____

Project No.: _____

Contract Title: _____

Contract No.: _____

Spec. Section No.: _____

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.

Date Engineer Received

Engineer's Action

(See Contract Documents)

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

13,800-Volt Metalclad Switchgear

Stillwater Electric Utility

Power Generation Station

CONTRACT NUMBER 5310

VOLUME NUMBER*

(Spine)

Stillwater Electric Utility 36

Power Generation Station 24

INSTRUCTION BOOK 36
FOR 36
13,800-VOLT METALCLAD SWITCHGEAR 36
VOLUME NUMBER* 36

CONTRACT NUMBER 5310 24

SUPPLIER'S NAME 24
SUPPLIER 'S ADDRESS 24
SUPPLIER'S ORDER NUMBER 24

Equipment Tag Number(s) 24

(Cover)

(Spine)	(Cover)	
480-Volt Switchgear and Bus Equipment	**Stillwater Electric Utility**	36
	Power Generation Station	24
Stillwater Electric Utility	**INSTRUCTION BOOK**	36
	FOR	36
	480-VOLT SWITCHGEAR AND BUS	36
	EQUIPMENT	36
	VOLUME NUMBER*	
Power Generation Station	**CONTRACT NUMBER 5310**	24
CONTRACT NUMBER 5310	**SUPPLIER'S NAME**	24
	SUPPLIER 'S ADDRESS	24
	SUPPLIER'S ORDER NUMBER	24
	Equipment Tag Number(s)	24
VOLUME NUMBER*		

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

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.

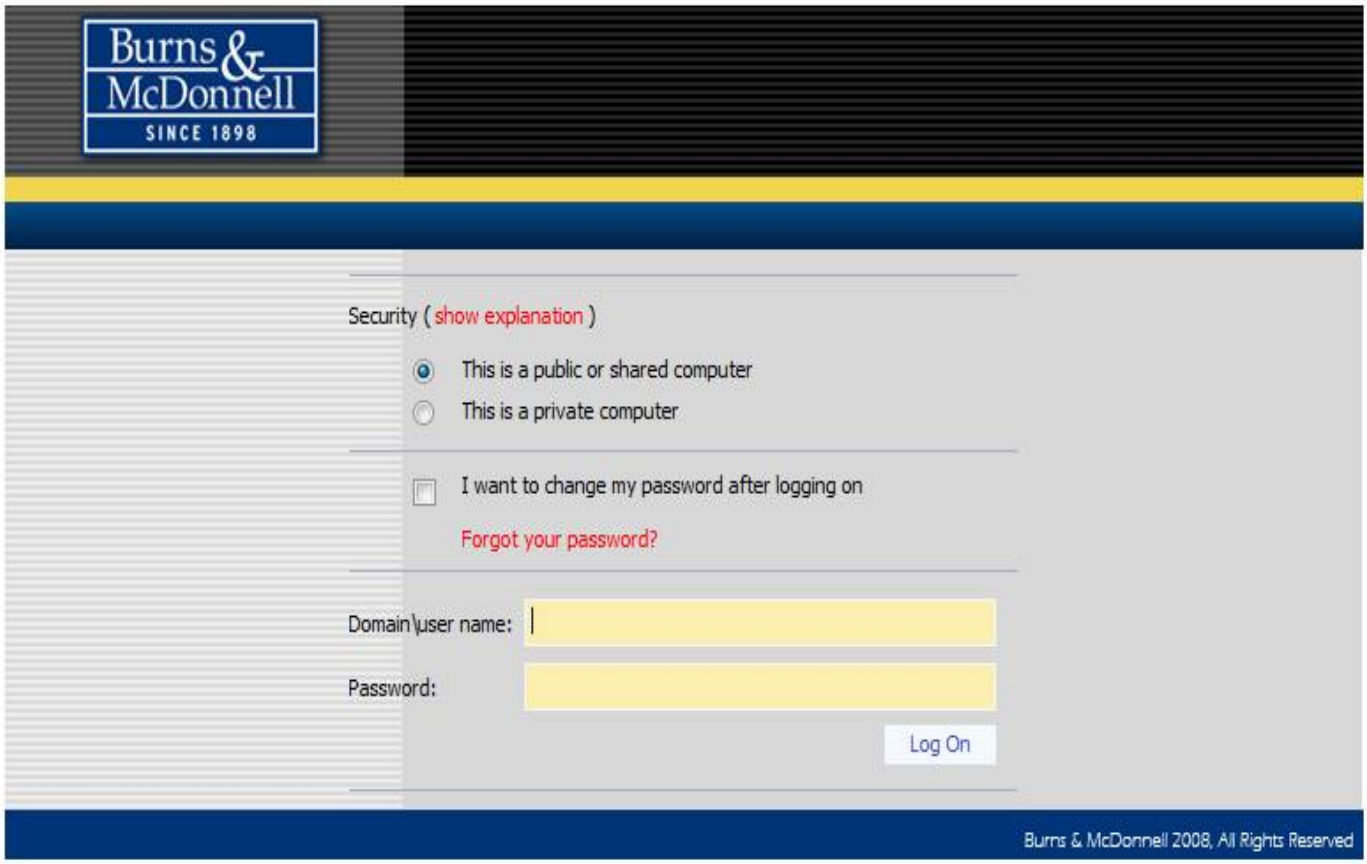
Previously you were not able to change the password you received, but now it can be reset after using the initial password from BMcD. After changing the password it cannot be changed again for 24 hours. Previously used passwords cannot be used again. The Domain is BMCDEXT and should preface your username.

To Login:

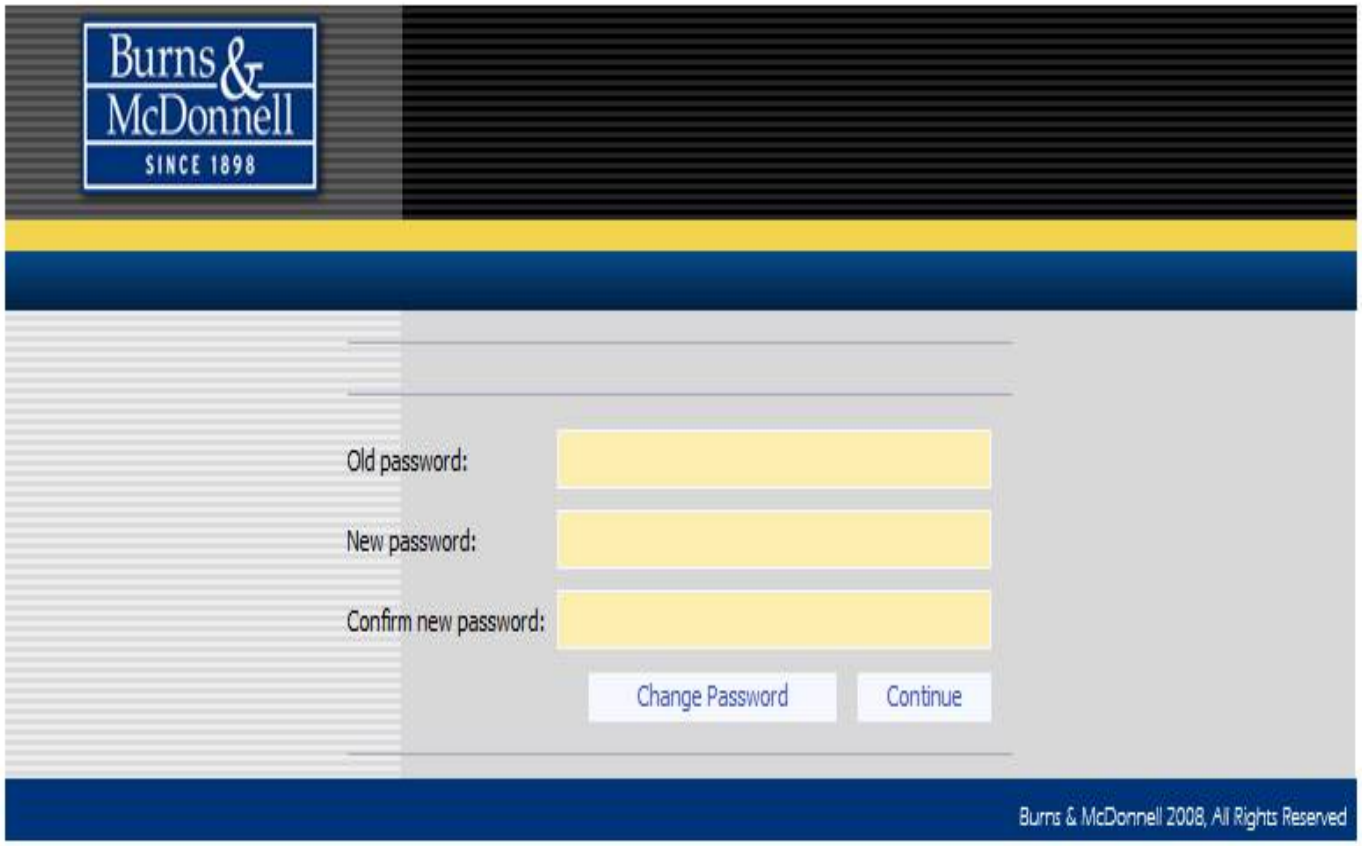
The Domain is BMCDEXTand should be typed in before the user name. **Example: BMcDext\[user ID] so the information would be BMcDEXT\ext_jdoe.**

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?"

Login Screen:



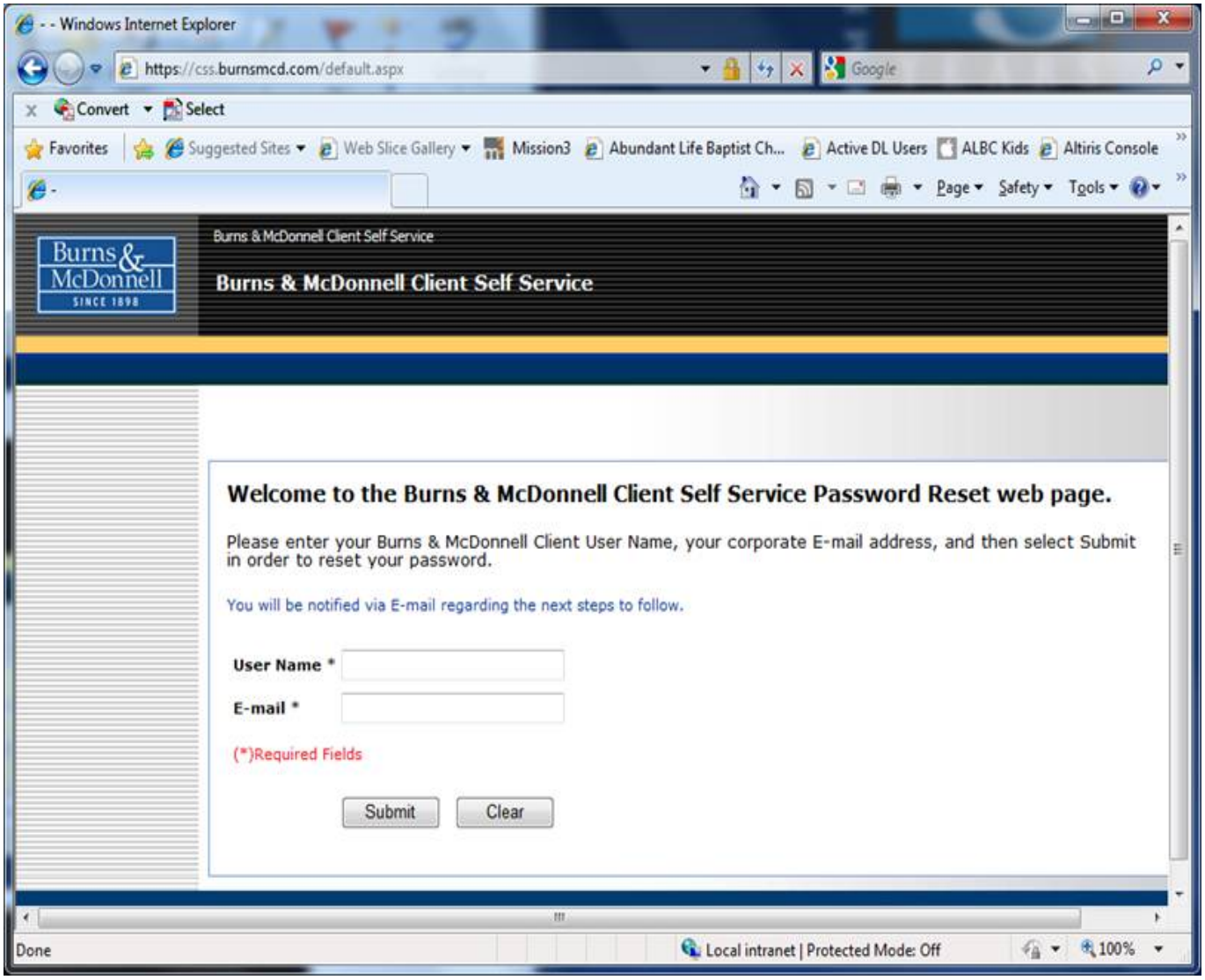
Set New Password screen:



- 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.

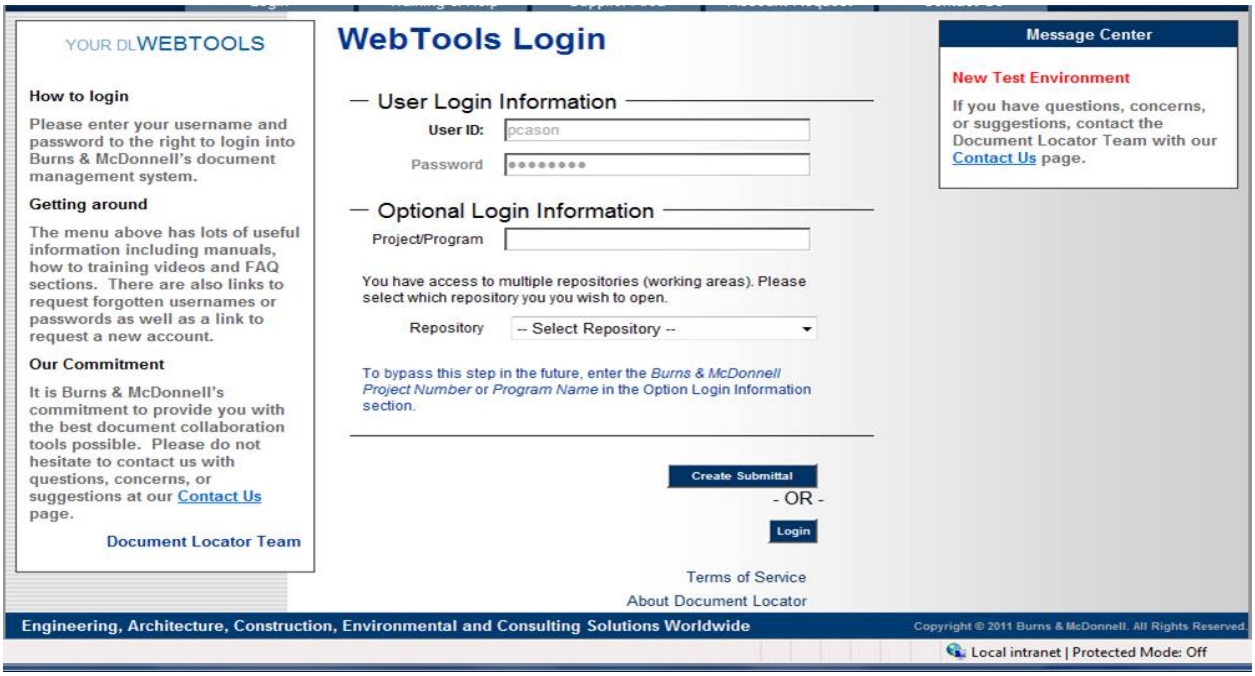
If you forgot your password you can have a new password sent to you by clicking the "Forgot your password". If so, the following screen will appear for requesting a new password.

Request New Password screen:



Creating a Submittal:

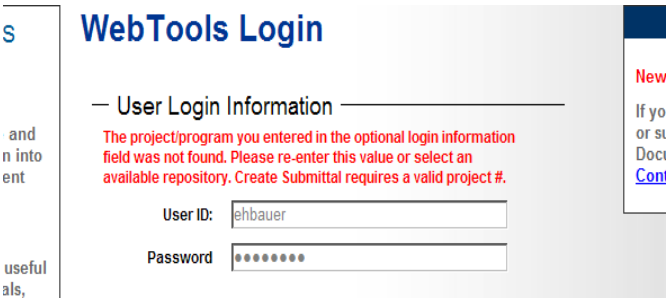
If your password does not need to be changed, use your current User ID and Password to log into WebTools.



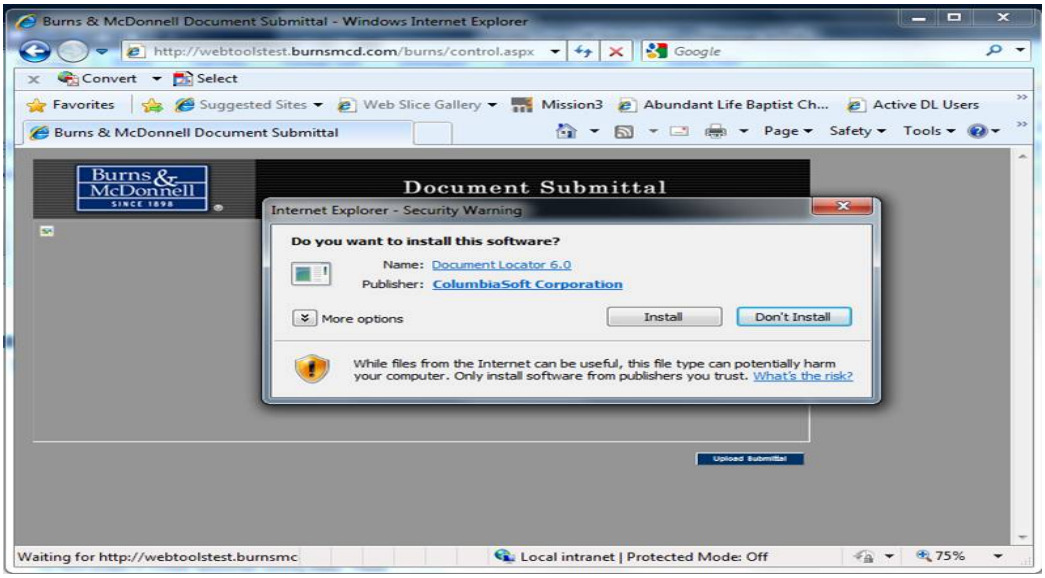
Your username and password information will be automatically populated into the BMcD Login screen.

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.

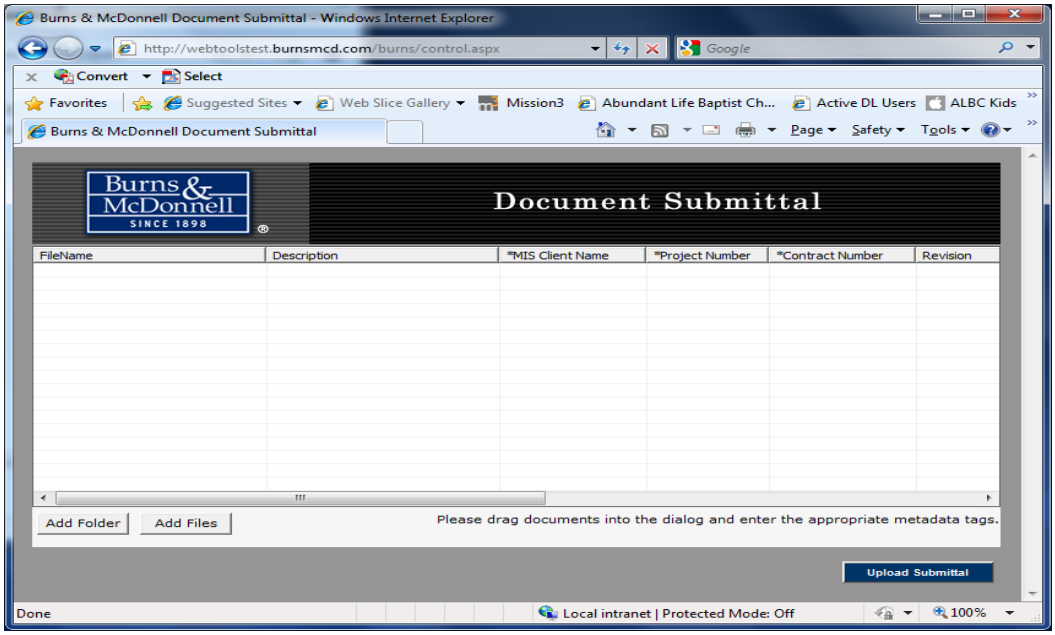
   If the number is incorrectly entered the following error message will be displayed. Check the number, if you believe you received this message in error you will need to contact your BMCD Document Control contact.



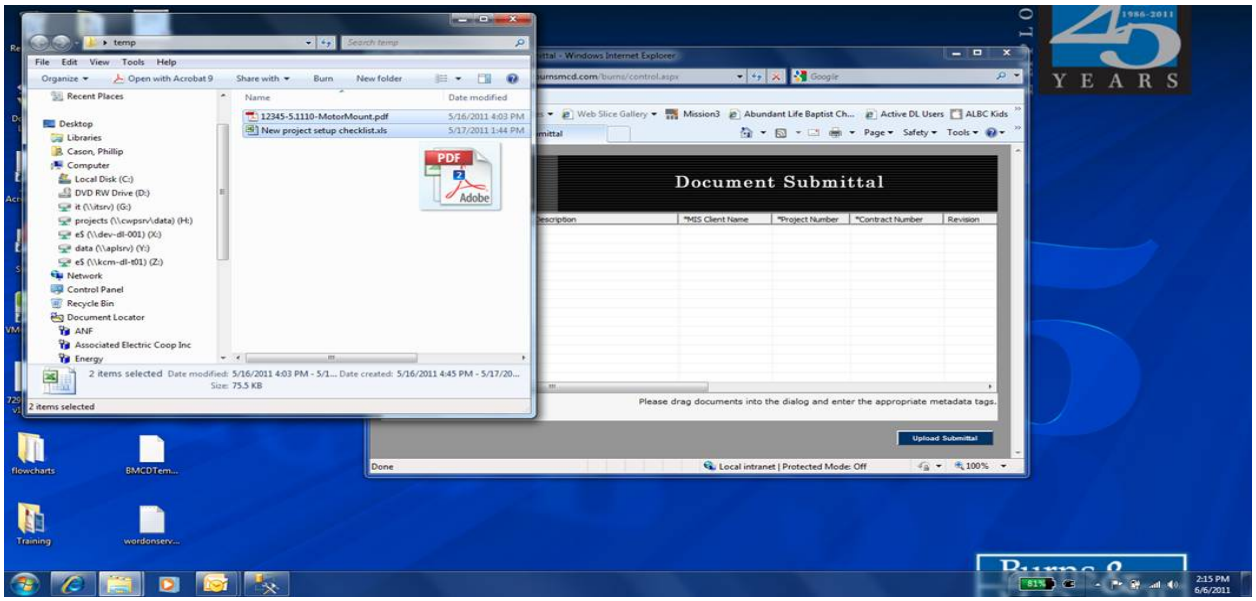
- If this is the first time you are visiting the Submittal screen then you will be prompted to load the ActiveX Add-On that will allow you to drag and drop documents into the screen. Click on Install to load the ActiveX Add-On.
  Note: Some companies prohibit the install of an ActiveX Add-On. If this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



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.

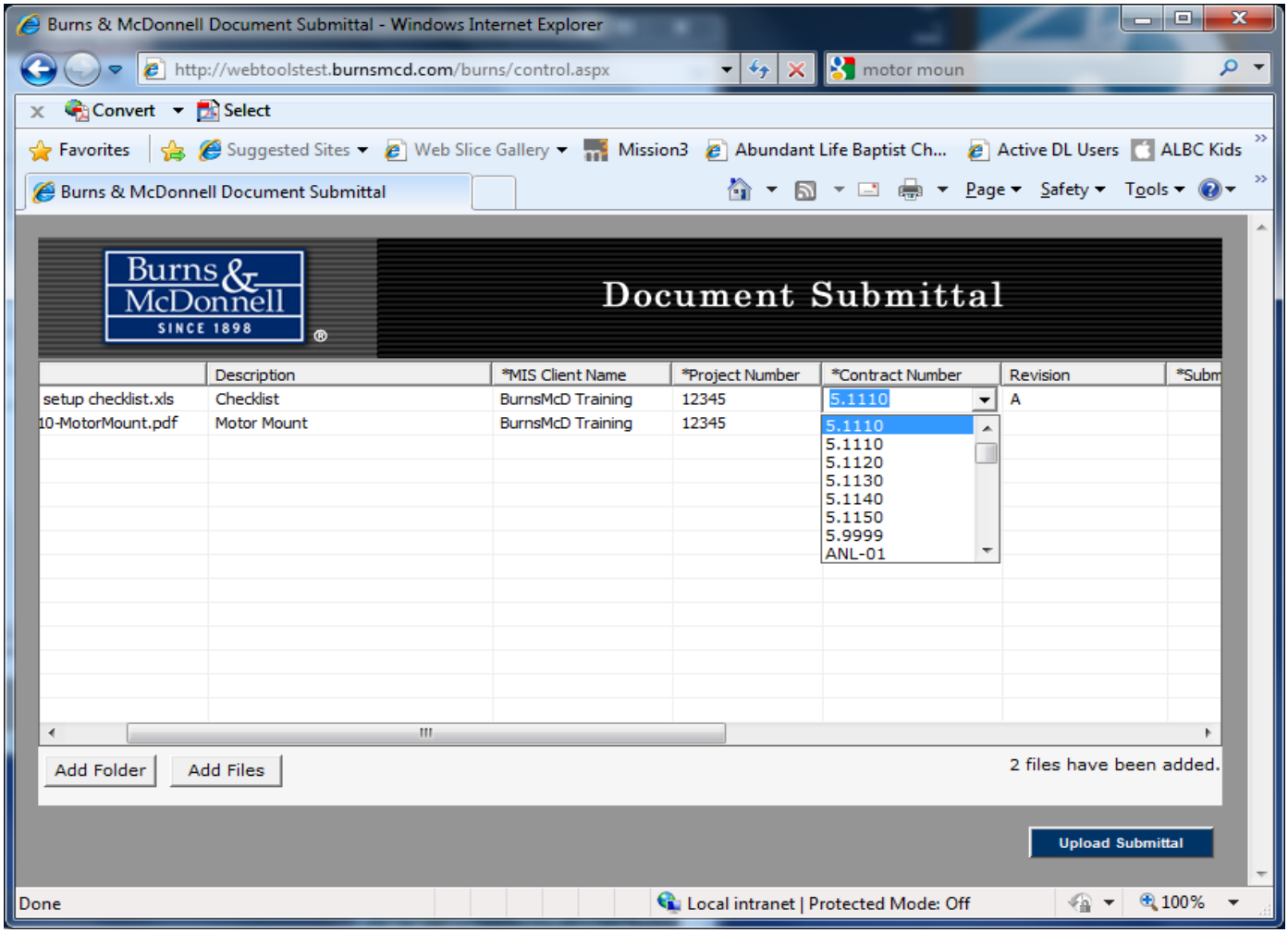
- The Filename, client name, and project number will be pre-populated in the Create Submittal window. <u>Before</u> dragging the files into the window make sure they follow the file naming requirements.
- **Filename** should be the same as the Drawing Name or Document Number.

  <u>Do not</u> include the following in the filenames:

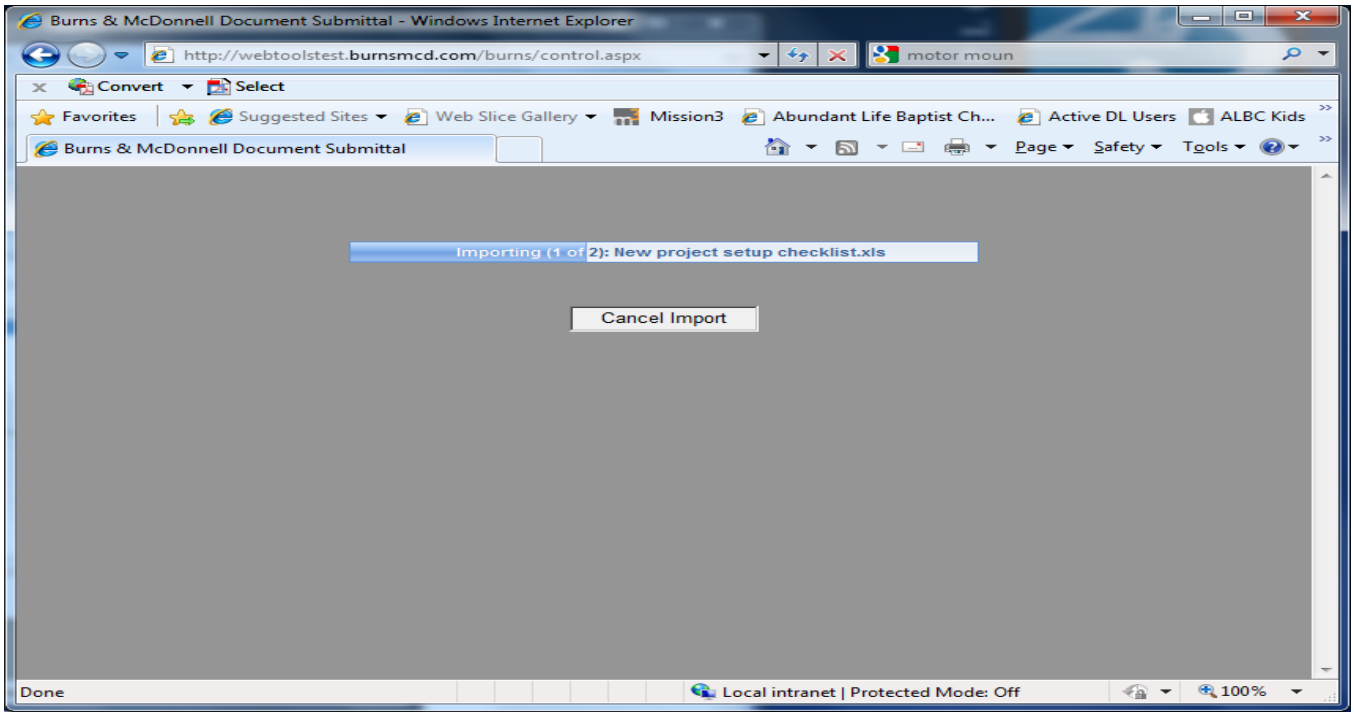
  a. Revision
  b. Dates
  c. Transmittal Information
  Note: If the document is being resubmitted then the filename must match EXACTLY with the previous submittal name.

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

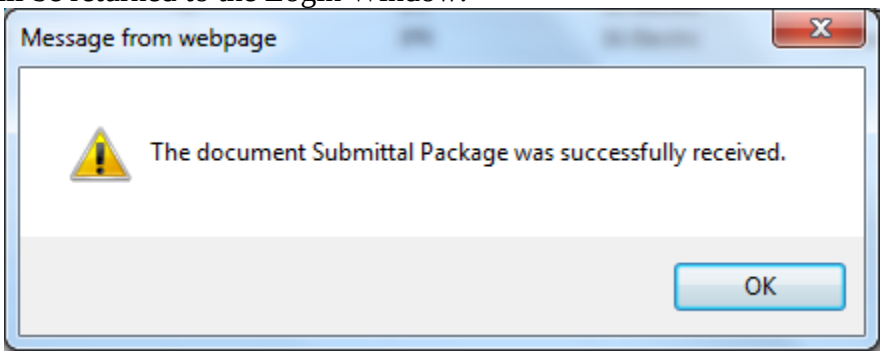
- **Description** is required and should relate to the **document title** from the title block of the drawing.
  Valid description include: General Arrangements, Weld Procedures, Code Calcs, Terminal Point List, Wiring Diagram – Analyzer.
- **Revision** should be the actual revision from the document 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.



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.



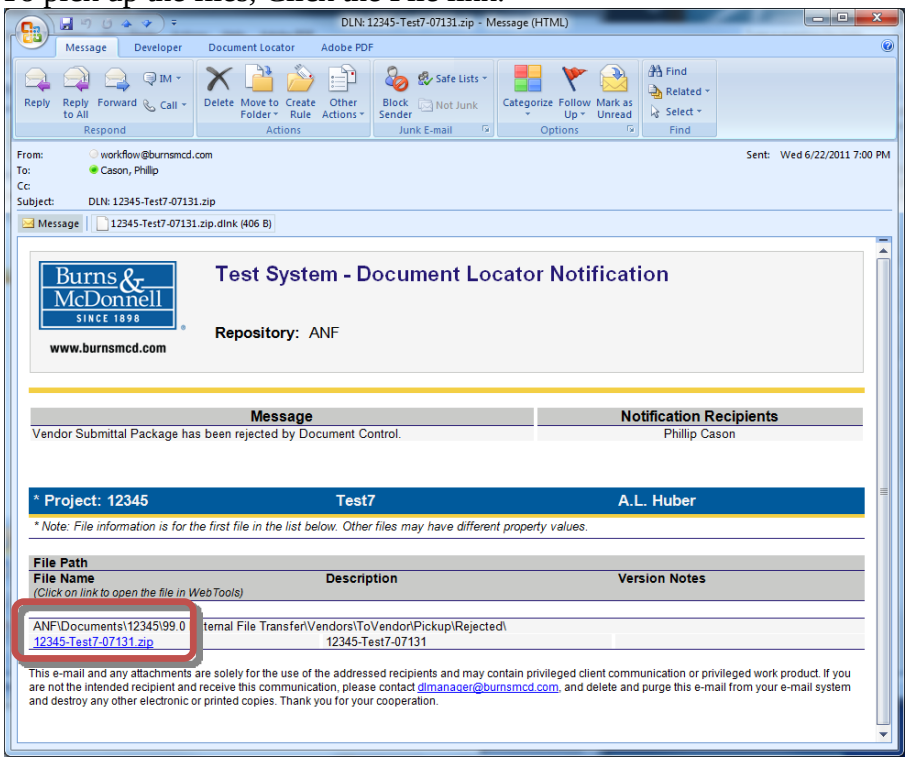
Notification of Receipt:

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.

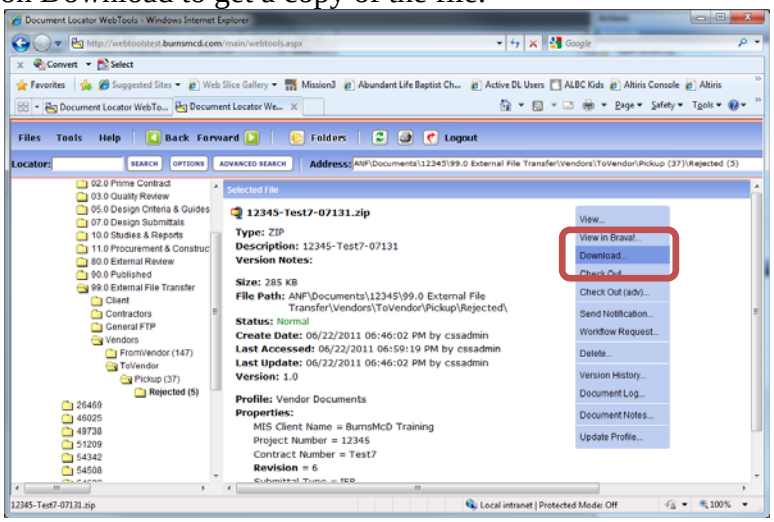
Picking up a Reviewed Submittal

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.
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.

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 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 startup, operation, and testing shall include:
   1. Inspecting and indicating approval or disapproval of the installation.
   2. Reporting his observations in writing to the installing contractor, with copies to Owner, at least once each week unless otherwise agreed.
   3. Determining when Equipment is ready for start-up and operational checks.
   4. Troubleshooting any issues during startup and commissioning of Supplier’s equipment.

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.
   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.
   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 searcheable 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 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.

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 - Carbon 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.

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 Equipment of dead front construction.
B. Furnish Materials suitable for their application, and for the mechanical and electrical stresses to which they will be subjected.
C. Furnish all current-carrying parts of high-conductivity copper unless specified otherwise.
D. Silverplate or tinplate all primary current connections and joints. Plating shall be done after all drilling and cutting operations are completed.
E. Provide space, cutouts, drilling, and blank plates for future equipment and for equipment installed by others where specifically indicated.
F. 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.
G. 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 Supplier's and Engineer'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. Terminate all current transformer secondary leads individually on short-circuiting type terminal blocks located in the control compartment. Connect the current transformer in wye or delta, as required, on the external connection side of this terminal block. Where a current transformer secondary circuit is connected to devices internal and external to the equipment, furnish a second short-circuiting type terminal block for external wiring connections.
    7. No more than two wires shall be terminated at any one terminal block stud or screw.

8. Use stranded, tinned copper switchboard wire, insulated for 600VAC, 90°C copper temperature, Type SIS, as follows:

Type of Circuit	Minimum Wire Size
Indicating light or annunciator	12 AWG
Transducer outputs	16 AWG (shielded)
Circuit breaker close or trip	12 AWG
Current transformer secondary circuits	10 AWG
Potential transformer secondary	12 AWG
Power supply branch circuit	12 AWG
Main ac power supply and main AC control buses	10 AWG
Main dc power supply and main DC control buses	8 AWG

9. Install internal wiring in horizontal and vertical wiring troughs or neatly dressed wire bundles for easy accessibility to interior wiring.
10. Label all wires at equipment studs and terminal blocks with slip-on wire sleeves stamped to indicate wire number and destination terminal number for opposite end of condutor as indicated on approved connection drawings.
11. Connect all internal grounds to the Equipment internal ground bus.
12. Terminate all internal control wiring individually with pre-insulated ring-tongue-type compression terminals on stud or screw-type terminals. Termination of bare control wire is not acceptable.
13. Terminate all potential transformer secondaries on a set of terminal blocks, located to provide convenient access.

H. Terminal Blocks:
1. All terminal blocks shall be heavy duty, rated not less than 30 amperes, 600 volts.
2. Terminal blocks for external control circuits (except in 480-volt motor control centers) shall be General Electric EB-25.
3. Terminal blocks for current transformer circuits shall be short-circuiting type. Furnish General Electric Type EB-27. Furnish with covers and sufficient shorting screws for each terminal.
4. Identify each terminal on each block with a permanent designation.
5. Mount terminal blocks vertically in rows with provisions for supporting external control cables entering from the top or bottom.

I. Finish:
1. Apply finish to all steel surfaces of Equipment.
2. Clean and treat surfaces with phosphatizing process or equal and apply all necessary filler before application of finish.
3. Apply a corrosion-resistant prime coat of paint and at least two finish coats of standard, ANSI 70 light gray paint.
4. Hot-dip galvanize all steel supporting structures and hardware in accordance with ASTM A123 and A153.

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

3.01 GENERAL:

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 261313 - 13,800-VOLT METALCLAD SWITCHGEAR

PART 1 - GENERAL

1.01 SUMMARY:

A. Work in this Section includes furnishing the following:
   1. Assemblies of medium voltage metal-clad arc-resistant switchgear:
      a. 13.8kV, 3000A, 3-phase, 60Hz switchgear 00-EAP-SWG-001.
   2. Each switchgear consisting of the following:
      a. Switchgear assembly as indicated and specified.
      b. Other accessories as indicated and specified.
   3. Maintenance equipment and spare parts as specified.
   4. Field Services as specified.

B. Furnish Equipment suitable for operation on 13,800-volt line-to-line, 3-phase, 3-wire, high-resistance-grounded system.

C. Related Work Specified Elsewhere:
   1. SECTION 262300 – 480-Volt Switchgear and Bus Equipment.

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. American National Standards Institute (ANSI):
      a. C37.04 - Rating Structure for AC High-Voltage Circuit Breakers.
      b. C37.06 – Standard for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis – Preferred Ratings and Related Required Capabilities for Voltages Above 1000V.
      c. C37.09 - Test Procedure for AC High-Voltage Circuit Breakers.
      d. C37.010 - Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      e. C37.11 - Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      f. C37.20.2 - Metal-Clad Switchgear.
      g. C37.20.7 – Testing Medium-Voltage Metal-Enclosed Switchgear Rated up to 38kV for Internal Arcing Faults.
      h. C37.90 - Relays and Relay Systems Associated with Electric Power Apparatus.
      i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
      j. C37.100 - Definitions for Power Switchgear.
      k. C57.13 - Requirements for Instrument Transformers.
      l. C57.13.6 – Standard for High-Accuracy Instrument Transformers.
      m. C62.1 – Gapped Silicon-Carbide Surge Arresters for AC Power Circuits.
      n. C62.11 - Metal-Oxide Surge Arresters for AC Power Circuits.
   2. National Electrical Manufacturers' Association (NEMA).
      a. CC1 - Electric Power Connection for Substations.
      b. SG4 – Alternating Current High-Voltage Circuit Breakers.
   3. American Society of Testing and Materials (ASTM).
   4. American Institute of Steel Construction (AISC).

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Includes, but not limited to, the following:

1. Switchgear:
   a. Arrangement and outline drawings.
   b. Installation drawings.
   c. Bills of material.
   d. AC Three-line diagrams.
   e. AC and DC Schematic diagrams.
   f. Point-to-point wiring diagrams that are physically representative of switchgear unit, including external connection terminals.
      (1) Diagrams of control and instrument circuits, contact arrangement of switches, and wiring of relays and instruments for each switchgear unit shall be on additional sheets as required. Interconnection diagrams shall be on separate sheets. All sheets shall be the same size.
      (2) Each item of switchgear mounted Equipment indicated on the diagrams shall be identified by item number and name.
   g. On the erection and assembly drawings, the Supplier shall include complete information for the tightening of all electrical connections secured with bolts or studs. The information furnished shall include torque requirements or complete details of other tightening procedures recommended for bus joints, connector attachments, and contact attachments.
   h. Assembly drawings that include any additional pieces such as arc flash deflection trim or other appurtenances and such devices shall be completely dimensioned on assembly drawings.
   i. Instrument transformer performance curves and nameplate data.
   j. Protective device coordination curves on full-size (9-1/2" x 11-1/16") log-log graph paper (similar to K& E No. 48-5258).
   k. Communications protocol information for all data communication devices and systems including communications connection diagrams and any applicable register lists.
   l. Instruction books.
   m. Separate schematic and wiring drawings shall be submitted for each breaker furnished. "Typical" drawings covering several breakers will not be acceptable.

C. In addition to other Submittal requirements, final drawings shall be furnished as AutoCAD Version 2012 files on PC - compatible CD-ROM disks.

1.04 QUALITY ASSURANCE:

A. Factory Tests: Submit certified statements that the Equipment furnished under this Section has passed the design and production tests in conformance with the ANSI Standards listed.

B. Type test evidence must be submitted to verify that prototype equipment was tested in the same configuration that is used to construct the Equipment provided under this Contract.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Circuit Breakers:
   1. ABB.
   2. Eaton.
   3. Powell.
   4. Siemens.

2.02 BREAKERS: Breakers shall be designed and constructed to conform to applicable standards and the following requirements:

A. Ratings as defined in IEEE C37.04, under altitude and ambient temperature conditions specified:
   1. Nominal Voltage Class: 13.8 kV.
   2. Rated Maximum Voltage: 15 kV.
   3. Rated Voltage Range Factor: 1.0
   4. Rated Withstand Test Voltages:
      a. Low Frequency: 36 kV.
      b. Impulse: 95 kV.
   5. Continuous current ratings: As indicated on drawings.
   6. Rated Short-Circuit Current: 50,000 Amperes.
   7. Rated Interrupting Time: 3 cycles.
   8. Rated Permissible Tripping Delay: Two seconds.
   9. Related Required Capabilities:
      a. Maximum Symmetrical Interrupting and Short Time Capability: 50,000 Amperes.
      b. Closing and Latching Capability: 130,000 Amperes.
   10. Rated Control Voltage: 125 volts DC.
   11. Control Voltage Range: 90-140 volts DC.

B. Type and Design:
   1. 3-pole, single-throw draw-out vacuum circuit breaker.
   2. Flame-retardant and track-resistant insulation materials.
   3. Self-aligning primary and secondary disconnecting devices.
   4. Auxiliary contacts, designated "52a" and "52b", mounted on each removable breaker element in sufficient quantity for all control and indicating functions integral to the breaker element. Furnish not less than four additional contacts for the Owner's use, two "a" and two "b" contacts.
   5. Secondary disconnecting devices shall be made in the breaker element test position to eliminate need of jumper cable.
   6. Provide provisions for manual stored energy closing, manual stored energy tripping, and spring recharge on loss of control power.
   7. All breakers of the same current rating shall be completely interchangeable.
   8. Breakers shall be removable from the front and shall be able to be racked in with all doors closed.
   9. The operating mechanism shall be trip-free in any position and shall include anti-pump provisions.
   10. The breaker main contacts shall not touch or arc across into a faulted circuit when a breaker close signal is received while a trip signal is being applied.
   11. Each breaker shall be furnished with a manual trip push button that mechanically trips the breaker. The manual trip push button and its associated breaker trip linkage shall have no common components with the electrical trip mechanism, except for the final breaker release device.
   12. Arrangement shall be provided for remote rack-in and rack-out of the breaker.

2.03 SWITCHGEAR: Switchgear shall be designed and constructed to conform to applicable standards and the following requirements:

A. Equipment shall be arranged as indicated on one line diagrams. Drawings are preliminary. Supplier shall proceed with design and issue certified shop drawings only after receiving final and approved arrangement drawings from the Engineer.

B. Voltage and short circuit current ratings shall be equal to those specified for the circuit breakers.
C. Main bus continuous current rating as indicated.
D. General Construction Details:
   1. Arc-resistant, free-standing, indoor, metalclad, dead-front, draw-out type with one circuit breaker per vertical section located in the bottom compartment.
   2. Arrangement of breaker units in each lineup shall be as indicated in one-line diagram.
   3. Switchgear shall be arc-resistant, Type 2B as defined for medium voltage switchgear in IEEE C37.20.7, protecting:
      a. The front.
      b. The sides.
      c. The back.
      d. All low voltage and instrument compartments.
   4. Arc resistant switchgear shall be designed to withstand the pressure wave and not permit burn through of the walls, or doors for minimum arc duration of 10 cycles. The arc-resistant switchgear shall be designed to minimize the spread of internal arcing faults and to provide protection to operating personnel by containing the arc byproducts and venting the gases in a safe controlled manner.
   5. Front hinged doors with single lever latch and removable bolted-on rear panels. Hinged doors shall close completely when the breaker is in the "disconnected" position. No additional bolting on hinged doors shall be required to meet short circuit rating.
   6. Bid shall include a minimum of 10 linear feet of arc exhaust duct and any required fittings. Duct shall be steel and have same exterior finish and paint as other switchgear equipment.
   7. Furnish arc exhaust duct hoods at exterior of building with integral dampers to allow for exhausting of arc flash while preventing outdoor elements from entering duct. Hoods shall be steel and have same exterior finish and paint as other switchgear equipment.
   8. Design shall be such that in case of an internal arc fault, all related exterior vents shall automatically close and pressure shall be directed into arc flash plenum and duct to exhaust gases to exterior of building.
   9. Where ventilation openings are required on the top of the switchgear, furnish a raised lip around and a cover over each group of ventilation openings to prevent the entrance of liquids dripping onto the top of the switchgear.
   10. High voltage buses shall be installed with rigid, non-tracking, fire-resistant, and nonhygroscopic insulating supports that are capable of withstanding the mechanical forces imposed by short-circuit currents equal to the close and latch and short-time current ratings (short-circuit making current and short-time withstand current ratings) of the circuit breakers.
   11. Ground bus with short time rating equal to that of the circuit breakers in the assembly extending the full length of the switchgear with 250kcmil connectors having 2 NEMA sized and spaced holes for ground cable connection at each end of each assembly. Connections to the ground bus shall not be coincident with the support bolts or splice joints. Ground each unit housing to this bus as well as each circuit breaker when in connected or test positions. Extend the ground bus to within six inches of the rear of each unit housing for grounding of Owner's power cable shields.
   12. Safety shutter covering the breaker connections painted a contrasting color, or identified by large letters painted a contrasting color so that section covering the main bus terminals is clearly distinguishable from the section covering the external connection terminals.

13. All current-carrying power connections shall be bolted connections, and all joints shall have minimal contact resistance.
14. Termination equipment for high-voltage connections:
    a. Furnish top-entry, metal-enclosed bus duct entrance connections as indicated. Include means for termination of the metal-enclosed bus duct enclosure or ground bus on the switchgear ground bus. Bus duct shall not be supported by current-carrying conductors. All required transpositions shall be made in the switchgear.
    b. Furnish tying bars for cable support in breaker units for connection of insulated shielded copper power cable entering from below.
    c. Cable terminals shall be silver-plated or tin-plated copper or aluminum NEMA 2-hole pads capable of terminating up to four (4) 1/C 750KCMIL insulated shielded copper power cables per phase.
    d. Cable entrance locations and ground sensor current transformer locations shall be field adjustable up or down and to the left or right of center in each vertical section to accommodate incoming conduits and cables.
15. Furnish all auxiliary metalclad compartments required, and spare compartments where indicated. All circuit breakers shall be furnished in the bottom compartment of each cubicle.
16. Switchgear bus phase sequence shall be clearly identified in the main breaker cubicle as 1-2-3 in conformance with IEEE C37.20.2, Article 7.1.2.
17. Furnish switchgear space heaters, and switchgear space heater power supplies as follows:
    a. Furnish 240 VAC-rated space heaters in each vertical section to prevent condensation. Apply space heaters at one-half rated voltage. Heaters shall be switched with a combination of 52H/b and 52S/b auxiliary contacts in parallel.
    b. One (1) 120-volt AC, single-phase, 2-wire power supply to the lineup of switchgear shall be furnished by Others for switchgear space heater supply. This main supply shall be protected by a Supplier-furnished main circuit breaker.
    c. Supplier shall furnish all branch circuit protection and interconnecting wiring such that the switchgear space heaters from each line-up of switchgear shall be supplied from the single power supply.
18. Furnish three metal oxide surge arresters (one per phase) for each feeder and main circuit breaker, coordinated with transformer insulation levels to provide complete protection from surges created by vacuum interrupters.
19. Terminal Blocks:
    a. Wire all spare contacts from breaker auxiliary switches and lockout relays to external connection terminal blocks.
    b. Terminal blocks for external connection to the switchgear shall include not less than ten spare grouped terminals in each breaker unit. Spare terminals shall have no connections or designated field or future connections.
    c. Terminal blocks shall not be mounted in compartments containing cable or bus operating at voltages above 600 volts.
    d. Each terminal block, conductor, relay, circuit breaker, fuse block, and other auxiliary devices and terminals shall be permanently labeled to coincide with the identification indicated on the drawings.
20. Control Wiring:
    a. Internal control wiring shall be in accordance with specification Section 260002.
    b. All wiring terminations shall be identified by wire sleeves on both ends of each conductor with wire number and reverse destination termination information.

21. Provide engraved laminated plastic nameplates for each switchgear assembly, each breaker unit, and each instrument and each control device mounted on the Equipment in accordance with specification Section 260002.
22. Furnish IR windows on rear of each vertical section of switchgear in which a power connection is made to enable thermography monitoring of power connections without having to open switchgear.
23. If specified, provisions for remote racking shall be included in the switchgear. Requirements for the remote racking control are listed in the Article "Maintenance Equipment and Spare Parts," this Section.

E. Instrument Transformers, Instruments, Relays, Meters, Switches and Other Control Devices:
1. Furnish and install all instrument transformers as indicated. Instrument transformers shall conform to applicable standards and shall meet the following requirements:
   a. Potential Transformers (PT): Current limiting fused, mounted on disconnecting primary type carriages with grounding devices, cast epoxy resin or butyl molded insulated or equal, 14400- 120-volt, 500-VA thermal rating in 30 degrees C ambient, with accuracy classification of 0.3 W, X, Y, Z, and M. Wire to set of terminal blocks for easy external connection.
      (1) For bus potential transformers, connect an auxiliary 500-VA at 30 degrees C, 1:1 wye-broken delta PT to the secondary of the 120:1 bus PT. Auxiliary PT shall be ABB type PPM or approved equal.
      (2) Furnish and connect, in parallel, an ABB VT Guard Pro and Post Glover adjustable damping resistor across the broken delta terminals of the auxiliary PT. Use of a heating coil as ferroresonance damping resistor is not acceptable.
   b. Current Transformers (CT): Dry type, toroidal bushing or wound type, with ratio as indicated, or as required for application. "C" or "B" accuracy classification in conformance with IEEE C57.13, except that for phase current transformers, accuracy classification shall be not less than C200 or B0.3. Current transformers for differential circuits shall not be less than C400. Current transformers shall have thermal and mechanical ratings corresponding to that of the breaker with which CT is applied.
2. Include all instruments, relays, meters, switches, and other devices specified and indicated as located at the switchgear. Specific types shall be as indicated in Table 1 at the end of this Section.
3. Protective relay CT circuits shall include ABB type FT-1 test switches as indicated on AC schematics. Protective type relays shall have external reset trip indicators.
4. All relays shall be rated for continuous picked-up service.
5. All solid-state protective relays shall be designed to withstand the surge withstand capability (SWC) test of IEEE C37.90.1.
6. For each set of potentials, furnish an FT-1 switch located on the front of the switchgear as indicated on AC schematics.
7. Ammeter switches shall have the neutral made up outside the switch to permit additions to the CT circuit.
8. Include ground sensor equipment, where indicated, designed to provide sensitive ground fault protection while being insensitive to phase-to-phase faults or normal load inrush currents.

F. Control Arrangement:
1. General Control Items and Features: Include the following:

a. Provisions for remote control with breaker control schemes to be operable in both "connected" and "test" positions of breaker as indicated on DC Schematics.
b. Local control switch with red and green light for each breaker with switch operable only in the "test" position of breaker, lights operable in both the "connected" and "test" positions.
c. Two mechanically interlocked 10,000 AIC molded-case circuit breakers in each lineup for connection of switchgear 125-volt DC bus to the "normal" or "standby" external supply circuits. Provide 125-volt DC undervoltage alarm relay connected across 125-volt DC trip and close power branches of each breaker with form “C” dry contact output wired out for remote alarm.
d. Three molded-case circuit breakers for each breaker. Electrical control scheme shall be similar to IEEE C37.11, Figure 1, Diagram B, 2 with the trip and close circuits individually protected. Relay DC power shall also have its own DC circuit breaker. DC breakers shall each include one (1) form “C” auxiliary dry contact for breaker status indication wired for remote alarm.
e. One or more 125-volt DC main breaker(s) to accept Owner’s 125-volt DC connection(s).
f. Auxiliary contacts for each breaker unit (52S) mounted on the stationary portion of the switchgear (52 MOC as defined in IEEE C37.20.2). Provide a minimum of eight 52S/a and eight 52S/b contacts. Contacts shall be field-convertible to either a or b type. Stationary-mounted auxiliary contacts shall normally be inoperable when the breaker element is in the "test" position. One set of equipment for making "52S" contacts operable in the "test" position shall be furnished with each breaker, and shall be field installable and removable without the use of any special tools.
g. Removable element position switches (52H) (52 TOC as defined in IEEE C37.20.2) with four "a" and four "b" auxiliary contacts in each breaker unit to be used with certain 52 and 52S auxiliary switch contacts when circuit breaker is in the "test" position or is removed from the cubicle.
h. Provide amber trip and blue supervise lights for each lockout relay. Provide contacts on lockout relays in the quantities required to operate lights and perform tripping, lock-out and alarm functions indicated. Provide a minimum of two spare "a" and two spare "b" contacts on each lockout relay as shown in DC schematic drawings. The lockout relays shall be Electroswitch type LOR24 with integral indicating lights.

2. Breaker Control Schemes: prepare schematic diagrams in accordance with the typical control schemes indicated.

G. Alarms: Include remote alarms as indicated on the typical schemes.

H. Provide An Outgoing Feeder Protection Scheme:
1. A SEL-751A multifunction relay shall be provided for main outgoing feeder protection and shall be installed in the door of the feeder breaker cubicle.
2. An FT-1 test switch shall be installed for the current and potential circuits to the relay as shown on AC Schematic diagram.
3. The SEL-751A shall be connected to current transformers on the bus side of the main breaker.
4. Install an Electroswitch LOR lockout relay on the door of the breaker cubicle.
5. Wire coil and contacts to terminal blocks. Wire the coil of the lockout relay to the designated trip output of the SEL-751A relay. Provide additional terminals as indicated for external trip inputs to the lockout relay. Wire normally closed contacts from the

lockout relay as indicated to a terminal block. Wire normally open contacts to a trip test switch and terminal blocks as indicated. Wire from each test switch to a terminal block.

I. Provide an Auxiliary Transformer Feeder Protection Scheme:
   1. A SEL-787 multifunction relay shall be provided for auxiliary transformer feeder protection and shall be installed in the door of each feeder breaker cubicle.
   2. An FT-1 switch shall be installed for the current and potential circuits to the relay.
   3. The SEL-787 shall be connected to current transformers on the bus side of the feeder breakers and to current transformers from the bus side of the 480V switchgear main breakers.
   4. Install an Electroswitch LOR lockout relay on the door of feeder breaker cubicles.
   5. Wire coil and contacts to terminal blocks. Wire the coil of the lockout relay to the designated trip output of the SEL-787 relay. Provide additional terminals as indicated for external trip inputs to the lockout relay. Wire normally closed contacts from the lockout relay as indicated to a terminal block. Wire normally open contacts to a trip test switch and terminal blocks as indicated. Wire from each test switch to a terminal block.

2.04 OUTSOURCING OF COMPONENTS

A. The Supplier shall include a list of all Equipment components that will be sourced from outside the final assembly plant with lead times longer than 30 Days with the Bid. This list shall give a detailed description of the component, its manufacturer, and the location it will be shipped from.

2.05 FACTORY ACCEPTANCE TESTS

A. After the switchgear has been completely fabricated, it shall be tested in accordance with the manufacturer's standard tests.
B. The Owner reserves the right to witness all tests. The Owner shall be notified two weeks in advance of the factory testing and may witness the testing for specification conformance at the factory prior to shipment.
C. Factory testing shall be include the following minimum items in accordance with all applicable standards:
   1. High voltage tests for all main and control circuits.
   2. Mechanical operation and interlocks.
   3. Circuit breaker operation tests, including local and remote trip/close.
   4. Current transformer and voltage transformer ratio and polarity check.
   5. Complete wiring check.
   6. Overall fit and finish.
   7. Accuracy of calibrated pickup and dropoff levels over the range of relay settings.
   8. Ethernet network verification and testing.
   9. Protective relay communications testing.

2.06 MAINTENANCE EQUIPMENT AND SPARE PARTS: Furnish the following maintenance equipment and spare parts:

A. One breaker test cabinet complete with 125V DC input, secondary disconnecting devices, test jumper, control relays, and push buttons, suitable for column mounting.
B. One set of special wrenches and removable hand cranks for breaker racking and manual spring recharge.
C. Two sets of test plugs for meters, relays, and test switches.
D. One breaker lift truck for removing and replacing breakers and VT carts in compartments including all necessary rails and removal hardware.

E. One ground and test device with six primary contacts mounted on a draw-out circuit breaker chassis to facilitate making ground or cable connections to primary stationary contacts by inserting the device in place of the draw-out circuit breaker. The device shall be dead-front, manually operated, with shutters to be opened for access to terminals, or with insulated test plugs. Device shall have adapters to fit the various ampere ratings of cubicles, or if adapters are not available a separate device shall be furnished for each ampere rating of cubicles. Devices shall be keyed for insertion in either the upper or lower compartment, but not both. Each device shall be clearly identified. Ground and test devices shall be rated equivalent to switchgear short circuit ratings.
F. Six spare primary fuses of each voltage and current rating used in the switchgear.
G. Twelve spare secondary fuses of each voltage and current rating used in the switchgear.
H. One remote racking device with 30-foot cable and remote operator station that may be connected to any switchgear and allow racking the breaker from test to operating position.
I. One (1) spare 3000A breaker.
J. Recommended spare parts list with price by manufacturer and listed in Supplier's Bid.

PART 3 - EXECUTION

3.01 FACTORY TESTS:

A. Bid Price shall include the required man-days and round trips to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.
B. Circuit Breakers: Test and Checks
   1. Megger each pole of breaker for freedom from grounds.
   2. Operate the breaker manually and visually inspect the breaker.
   3. Check for proper clearances of all items.
   4. Check for proper lubrication.
   5. Inspect all bushings.
   6. Check all secondary contacts for proper operation.
   7. With breaker in switchgear, operate the breaker electrically and check for proper operation.
   8. Check continuity of breaker frame ground.
   9. Owner will perform other field testing under a separate contract, including:
      a. Field high-potential test of each breaker.
      b. Check of each breaker electrical operation for conformance with electrical schematics.
C. Metalclad Switchgear -Test and Checks:
   1. Check all safety interlock mechanisms for proper lubrication, adjustment, and operation.
   2. Megger all power buses with a 1,000-volt megger. Grounded ac circuits, instruments, and fuses should not be meggered.
   3. Inspect all buses, surge arresters, and insulators.
   4. Inspect control and instrument switches and adjust contacts if required.
   5. Check all fuses.
   6. Check connections to instruments and adjust instrument indicating pointers.
   7. Check operation of switchgear alarm contacts.
   8. Initial check of proper breaker tripping by manual or electrical operation of protective relay contacts.
   9. Check all circuit breaker cell interlocks for conformance with the Specifications.
   10. Check all internal electrical interlocks and automatic transfer sequences for specified operation.

11. Functional tests of all metering units, multi-function relays, and communications I/O equipment.
12. Owner will perform other field testing under a separate contract, including:
    a. Field high-potential test of switchgear buses.
    b. Check and measure equipment grounds.
    c. Check operation of heaters in bus duct and switchgear where specified.
    d. Conduct polarity tests on current and potential transformers.
    e. Bench testing of all protective relays, and setting of values specified by the Owner/Engineer.
    f. Protective relay trip testing of breakers by high current tests or other electrical means, and energized checks on relaying circuits as required by the Owner/Engineer.

3.02 FIELD SERVICES:

A. Bid Price shall include five man-days and one round trip to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.

B. Manufacturer's field representative shall assist installing contractor with assembly and installation of switchgear per Supplier's installation and operation and maintenance manuals.
    1. Inspection of switchgear for damage during shipment and installation.
    2. Makeup of shipping split wiring connections.
    3. Makeup of shipping split bus and enclosure connections.
    4. Verification of final setting of the switchgear lineup per Supplier's requirements.
    5. Coordinate and make installing contractor aware of any additional installation requirements.
    6. Insert breakers and instrument transformers into cubicles and verify alignment. Adjust alignment if necessary for proper operation.

Table 1

Device	Manufacturer	Type	Substitute
(1) Breaker Control Switches	Electroswitch	Series 24	No
(2) Lockout Relays	Electroswitch	Type 24 LOR	No
(3) Selector Switches	General Electric	CR104P	Or Equal
(4) Indicating Lights	General Electric	ET-16 LED Cat. #116B96708 G43	Or Equal
(5) Auxiliary Transformer Protection Relay	Schweitzer	787 Part # 0787EX1ACACA75850830	No
(6) Main Breaker Relay	Schweitzer	751A Part # 751A51A1A1A76850810	No
(7) Bus Differential 87B	Schweitzer	587Z Part # 0587Z0X615312XX	No
(8) Power Meter	Schweitzer	735 Part # 0735HX00944GXXA4XX1610 1XX	No
(9) Auxiliary Relay in Trip and Close Circuits	ABB	MG-6	Or Equal
(10) Current and Potential Test Switches	ABB	FT-1	No
(11) Zero-sequence Overvoltage 59N	Basler	BE1-59N Part # BE1-59NA5E-E1J-C0N1F	No

END OF SECTION 261313

SECTION 261320 – 13,800-VOLT METALCLAD SWITCHGEAR - DATA TO BE SUBMITTED WITH BID

PART 1 - GENERAL:
This Section shall apply to SECTION 261313 and shall be completed for each switchgear supplied.

1.01 CONFORMANCE TO SPECIFICATIONS:
Contractor shall furnish Equipment and Material conforming fully to the Specifications regardless of any variance indicated by the data in this SECTION.

1.02 OUTLINE DRAWINGS:
A. The Bidder shall submit with the Bid a preliminary outline drawing for each switchgear indicating the following information: _____
1. Overall width. _____
2. Overall depth. _____
3. Overall height _____
4. Attachment locations of base. _____
5. Areas that must be maintained clear. _____

PART 2 - PRODUCTS

2.01 GENERAL:
A. General Information:
1. Manufacturer _____
2. Breaker Element Vendor/Model _____
3. Ship date (assuming order in 30 days) _____
B. Ratings and Performance: _____
1. Main Breaker CT Accuracy Class _____
2. Main Breakers Number of CTs/phase _____
3. Main Breaker CT Ratio _____
4. Number of Bus PT's/Incoming PTs
5. Surge Arrester Model and class Model _____ Class _____

6. Breaker interrupt rating at 13800V, kA _____
7. Breaker close and latch rating at 13800V, kA _____
8. Bus Rated Continuous Amps _____
9. Bus short circuit rating, kA _____
10. Heat Dissipation/Breaker Cubicle, watts _____

2.02 CONSTRUCTION DETAILS:
A. Access:
1. Power Cable Access Top _____ Bottom _____
2. Control Cable Access Top _____ Bottom _____
3. Latching of Breaker Door Lever _____ Bolted _____
B. Accessories: _____
1. Control Switch Model _____
2. Indicating Light Model _____
3. Metering Model _____
4. Auxiliary Relay Model (if used) _____

5.	Timing Relay Model (if used)			
6.	PLC Model (if used)			
7.	PLC Power Supply Required			
8.	DC Breaker Model			
9.	Heater AC Breaker Model			
10.	Number of heaters/watts/volts	#Heaters	Watts	Volts
11.	Number of Grounding devices provided and Short Circuit rating	Number	KA	

2.03 SHIPPING INFORMATION:

A.	Factory of Manufacture		
B.	Origin of Shipment		
	Number of shipping splits		
	Size of largest shipping split	H=	W= D=
	Weight of largest shipping split		lbs

PART 3 - EXECUTION: Not Applicable.

END OF SECTION 261320

SECTION 262300 - 480-VOLT SWITCHGEAR AND BUS EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY:

A. Work in this Section includes furnishing the following:
   1. The following main-tie-main 480V, metal-enclosed switchgear lineup, consisting of a transformer remotely connected to a coordinated assembly of metal-enclosed switchgear via non-segregated phase bus duct:
      a. 480V Switchgear Lineup 00-EAP-SWG-011.
   2. Maintenance equipment and spare parts as specified.
   3. Field Services as specified.

B. Furnish Equipment suitable for operation on 480 volt, 3-phase, high-resistance grounded systems.

C. The Equipment specified in this Section shall also conform to the requirements of SECTION 260002.

D. Related Work Specified Elsewhere:
   1. SECTION 261313 – 13,800-Volt Metalclad Switchgear.

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 Electronics Engineers (IEEE):
      a. C37.11 - IEEE Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      b. C37.13 - Low-Voltage AC Power Circuit Breakers Used in Enclosures.
      c. C37.16 - Preferred Ratings, Related Requirements, and Application Recommendations for Low-Voltage AC (635 V and below) and DC (3200 V and below) Power Circuit Breakers.
      d. C37.17 - Trip Systems for Low-Voltage (1000 V and below) AC and General Purpose (1500 V and below) DC Power Circuit Breakers.
      e. C37.20.1 - Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear.
      f. C37.23 - Metal-Enclosed Bus.
      g. C37.81 – Guide for Seismic Qualification of Class 1E Metal-Enclosed Power Switchgear Assemblies.
      h. C37.90 - Relays and Relay Systems Associated With Electric Power Apparatus.
      i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
      j. C37.100 - Definitions for Power Switchgear.
      k. C39.1 - Requirements for Electrical Analog Indicating Instruments.
      l. C57.13 - Standard Requirements for Instrument Transformers.
   2. National Electrical Manufacturer's Association (NEMA):
      a. CC 1 - Electric Power Connectors for Substations.
      b. SG 5 - Power Switchgear Assemblies.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Includes, but not limited to, the following:
   1. Arrangement and outline drawings.
   2. Installation drawings.
   3. Bills of Material.

4. One-line diagrams.
5. AC three-line diagrams.
6. AC & DC schematic diagrams.
7. Wiring diagrams, including external connections terminals.
8. Instrument transformer performance curves and data.
9. On the erection and assembly drawings, the Supplier shall include complete information for the tightening of all electrical connections secured with bolts or studs. The information furnished shall include torque requirements or complete details of other tightening procedures recommended for bus joints, connector attachments, and contact attachments.
10. Assembly drawings that include any additional pieces such as arc flash deflection trim or other appurtenances and such devices shall be completely dimensioned on assembly drawings.
11. Protective device coordination curves on full-size (9-1/2"x11-1/16") log-log graph paper (similar to K&E No. 48-5258).
12. Communications protocol information including project-specific register list for all data communication devices and systems.
13. Instruction books.
14. Separate schematic and wiring drawings shall be submitted for each breaker. "Typical" drawings covering several breakers will not be acceptable.
15. Details on insulating barriers between cable terminals and main bus.

C. In addition to other submittal requirements, final drawings shall be furnished as AutoCAD 2012 files on PC-compatible CD-ROM disks.

1.04 QUALITY ASSURANCE:

A. The switchgear shall completely wired and tested at the factory.

B. Factory Tests: Submit certified statements that the Equipment furnished has passed the design and production tests in conformance with the standards listed. The tests shall include but not limited to:

1. Draw-out Air Circuit Breakers Tests and Checks:
   a. Megger each pole of breaker for freedom from grounds.
   b. Check operating voltage at closing and tripping coils to determine if voltage is of proper value. Check fuses.
   c. Operate the breaker manually and visually inspect the breaker.
   d. Adjust the gap of the primary contacts according to manufacturer's instructions.
   e. Check for proper clearances of all items.
   f. Check for proper lubrication.
   g. Inspect all bushings and arc chutes for condition and cleanliness.
   h. Check all secondary contacts for proper operation.
   i. With breaker in switchgear, operate the breaker electrically and check for proper operation.
   j. Check continuity of breaker frame ground.
2. Metal-Enclosed Switchgear Tests and Checks:
   a. Check all safety interlock mechanisms for proper lubrication, adjustment and operation.
   b. Megger all power buses with a 1,000-volt megger. Grounded AC circuits, instruments and fuses should not be meggered.
   c. Inspect all buses and insulators for condition and cleanliness.
   d. Inspect control and instrument switches for clean and properly adjusted contacts.

e. Check all fuses.
f. Check connections to instruments and adjust instrument indicating pointers.
g. Check operation of switchgear alarm contacts.
h. Initial check of proper breaker tripping by manual or electrical operation of protective relay contacts.
i. Check all circuit breaker cell interlocks for conformance with the Specifications.
j. Check all internal electrical interlocks and automatic transfer sequences for specified operation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Power Circuit Breakers:
1. ABB.
2. Eaton.
3. Siemens.
4. GE.

2.02 POWER CIRCUIT BREAKERS: Power circuit breakers shall be designed and constructed to conform to applicable standards and the following requirements:

A. Ratings:
1. 600 volts ac, three phase, 60 hertz.
2. 4 cycle or less interrupting time.
3. 5 cycle closing on all electrically operated breakers.
4. Current ratings (unfused breakers):

Designation	Continuous Rating (RMS Amps)	Short Circuit and and Short Time Rating Without Requiring Instantaneous Tripping (RMS Symmetrical Amps at 508 volts)
4000	4,000	85,000
3200	3,200	65,000
2000	2,000	65,000
1600	1,600	65,000
800	800	65,000

B. Type and Design:
1. Three pole, single throw.
2. Electrically and mechanically trip free.
3. Drawout type.
4. All breakers shall be electrically-operated and control voltage shall be 125-volts DC.
5. Manual closing handle whether manual or electric operation.
6. Microprocessor overcurrent trip devices.
   a. Self-contained with breaker and shall not require an external control power source to trip the breaker under fault or overload conditions.
   b. Trip units shall include metering and LSIG trip functions.
   c. Functions are defined as follows:
      (1) L - Adjustable long time.
      (2) S - Adjustable short time.
      (3) I - Adjustable instantaneous.

(4) G - Adjustable ground.

d. Instantaneous and Ground functions shall be able to be turned off.

e. Trip units shall be RMS sensing and shall provide selective tripping among main, tie, and feeder breakers.

f. Trip units shall provide targets for all trip functions and internal diagnostics of the circuitry.

g. Trip units shall be capable of transmitting all real time metered data to Owner's computer system via a standard RS-422 or RS-485 interface with a single external connection point for communications. Supplier shall furnish an Ethernet gateway to allow for additional Modbus TCP/IP connection.

7. Overcurrent lockout and alarm contact output with hand reset, actuated only by the overcurrent trip device.
8. Individual removable arc chutes on each phase, constructed of suitable material for arc interruption, and special flame-retardant, track-resistant insulation.
9. Self-aligning primary and secondary contacts.
10. For electrically operated breakers, furnish a minimum of two "a" and "b" auxiliary contacts mounted on each removable breaker element for Owner's use in external control circuits. Furnish additional contacts as required or indicated.
11. For manually operated breakers, provide two "a" and two "b" contacts mounted on each removable breaker element for Owner's use in external control circuits.
12. Secondary contacts made in test position to eliminate need of jumper cable.
13. Key interlocks coordinated with other equipment as indicated.
14. All breakers completely interchangeable with those of same continuous current and short-circuit current ratings.

2.03 480-VOLT SWITCHGEAR: Switchgear shall be designed and constructed to conform to applicable standards and the following requirements:

A. Ratings under altitude and ambient temperature conditions specified:
1. 600 volts AC, suitable for operation on a high-resistance grounded system rated 480-Volts, 3 phase, 3 wire, 60 hertz.
2. Main bus continuous current rating as indicated on one line diagram.
3. Vertical buses for connection to feeder breakers shall have a continuous current rating equal to the main horizontal bus rating.
4. Vertical buses for bus duct connections shall be rated the same as connecting bus duct.
5. Mechanically and thermally capable of withstanding without damage short-circuit stresses corresponding to the symmetrical short-circuit ratings indicated.

B. Type and Design:
1. Indoor metal-enclosed, drawout type.
2. Arrangement shall be as indicated.
3. Switchgear shall be arc-resistant, Type 2B as defined in IEEE C37.20.7 as protecting:
a. The front.
b. The sides.
c. The back.
d. All low voltage and instrument compartments.
4. Arc resistant switchgear shall be designed to withstand the pressure wave and not permit burn through of the walls, or doors for minimum arc duration of 10 cycles. The arc-resistant switchgear shall be designed to minimize the spread of internal arcing faults and to provide protection to operating personnel by containing the arc byproducts and venting the gases in a safe controlled manner.

5. Design shall be such that in case of an internal arc fault, all related exterior vents shall automatically close and pressure shall be directed into arc flash plenum and duct to exhaust gases to exterior of building.
6. Bid shall include a minimum of 10 linear feet of arc exhaust duct and any required fittings. Duct shall be steel and have same exterior finish and paint as other switchgear equipment.
7. Furnish arc exhaust duct hoods at exterior of building with integral dampers to allow for exhausting of arc flash while preventing outdoor elements from entering duct. Hoods shall be steel and have same exterior finish and paint as other switchgear equipment.
8. Front hinged doors and removable bolted-on rear panels. Hinged doors shall close completely when the breaker is in the "disconnected" position.
9. Removable rear covers to permit access to power connections and bus.
10. Ground bus with short-time rating corresponding to the symmetrical short-circuit ratings indicated extending the full length of the switchgear with 250-kcmil lugs for ground cable connection at each end of each assembly. Connections to the ground bus shall not be coincident with the support bolts or splice joints. Ground each unit housing to this bus as well as each circuit breaker when in connected or test positions.
11. Neutral Grounding Resistors:
    a. Furnish high-resistance grounding resistors integral to switchgear lineup for each main breaker as indicated on one line diagram.
    b. Limit ground fault current to 5 amperes.
    c. Shall include 59N relay with adjustable setpoints and a minimum of two, normally open contacts for alarm.
    d. Ground fault indicating light.
    e. Normal operation indicating light.
    f. Local alarm reset.
    g. Ground voltmeter.
12. All breaker compartments shall be complete with rails, guides, interlocks, primary and secondary disconnecting devices, and all other features as required for installation of a breaker to serve a circuit by connection of power cables to rear load terminals and connection of control cables to terminal blocks.
13. Termination equipment:
    a. Furnish metal-enclosed bus duct entrance connections as indicated. Include means for termination of the metal-enclosed bus duct enclosure or ground bus on the switchgear ground bus. Bus duct shall not be supported by current carrying conductors. All required transpositions shall be made in the switchgear.
    b. Furnish tying bars for support of insulated copper power cable entering from above or below in all units where bus duct is not indicated.
    c. Cable terminals shall be silver-plated or tin-plated copper NEMA 2-hole pads in sufficient quantity for the incoming cables, but not less than two.
    d. Cable terminals shall be isolated from the main bus. This may be achieved by Owner-approved barriers between the terminals and the main bus or by an insulated main bus system.
14. Furnish an isolated compartment for the control wiring.
15. Furnish all auxiliary compartments required, and spare compartments where indicated.
16. Switchgear bus phase sequence shall be clearly identified in the main breaker cubicle as 1-2-3 in conformance with IEEE C37.20.1, Article 7.1.1.1.
17. Furnish load center space heaters and space heater power supplies as follows:

a. Furnish 240VAC-rated thermostatically controlled space heaters in each vertical section as required to prevent condensation. Apply space heaters at one-half rated voltage.
b. Owner will furnish one 120 volt ac, single-phase, 2-wire power supply to the lineup. This main supply shall be protected by a Supplier-furnished main circuit breaker.
c. Supplier shall furnish all branch circuit protection and interconnecting wiring such that the switchgear space heaters from each line-up of switchgear shall be supplied from the single power supply.

18. Terminal Blocks:
    a. Wire all spare contacts from breaker auxiliary switches and lockout relays to external connection terminal blocks.
    b. Terminal blocks for external connection shall include not less than 10 spare grouped terminals for each breaker. Spare terminals shall have no connections or designated field or future connections.
    c. Each terminal block, conductor, relay, circuit breaker, fuse block, and other auxiliary devices and terminals shall be permanently labeled to coincide with the identification indicated on the drawings.
19. Provide engraved laminated plastic nameplates with white background and black core for each major piece of Equipment, each instrument and each control device mounted on the Equipment as described in Section 260002.
20. Provide 3/8” wide red plastic strip showing mimic bus, circuit breakers, and voltage transformers.
21. Furnish IR windows on rear of each vertical section of switchgear as required to enable thermography monitoring of power connections without having to open switchgear.
22. Switchgear lineup shall be furnished with a top-mounted travelling breaker lift device for removing and replacing circuit breakers. Lift device shall not interfere with entrance of conduits or bus duct.

C. Instrument Transformers, Instruments, Relays, Meters, Switches, and Other Control Devices:
1. Furnish all instrument transformers as indicated. Instrument transformers shall conform to applicable standards, and shall have suitable mechanical, thermal, and accuracy ratings as indicated on drawings. Wire potential transformers to a set of terminal blocks for easy external connection. Potential transformers shall have a minimum rating of 500 VA at 30-degree C ambient, with metering accuracy classification of 0.3W, X, Y, Z, and M at all burdens up to the thermal rating of the transformer.
2. Circuit breakers connected to potential transformer secondaries shall each have at least one (1) form C auxiliary status contact wired out to external terminal blocks.
3. Include all instruments, relays, meters, switches, and other devices specified and indicated as located at the switchgear. Specific types shall be as indicated on one line diagram. Specific types shall be as indicated in Table 2 at the end of this Section.
4. Manufacturers for protective relays shall be as shown on drawings.
5. Indicating lights shall be General Electric type ET16 with LED lamp or Engineer-approved equal.
6. All solid-state equipment shall be designed to withstand the surge withstand capability (SWC) test of IEEE C37.90.
7. Furnish type FT-1 test switches located on the front of the switchgear as indicated on drawings.
8. Ammeter switches shall have the neutral made up outside the switch to permit extension of the CT circuit.

D. Control Arrangement:

1. General Control Items and Features: Include the following:
   a. All electrically operated breakers shall operate as indicated on the control schemes provided.
   b. Provide one 10,000-AIC molded-case circuit breaker in each switchgear assembly for connection of the switchgear 125-volt dc control power bus to an external supply circuit. Provide 125-volt dc alarm relay connected across 125-volt dc bus of each switchgear assembly with contact to close on loss of dc, wired out for remote alarm.
   c. Two sets of control power circuit breakers for each electrically operated breaker. Electrical control scheme shall be similar to IEEE C37.11, Figure 1, Diagram B, 2, with the trip and close circuits individually protected. Provide additional control power circuit breakers for other control circuits such as relay circuits as indicated.
   d. One or more 125-volt DC main breaker(s) to accept Owner's 125-volt DC connection(s).
   e. Mechanism operated switches (52MOC as devined in C37.20.1, Article 7.1.3.4) for each breaker. 4 N.O. and 4 N.C. contacts shall be available for external use over and above those required for switchgear internal control functions.
   f. Removable element position switches (52TOC as defined in IEEE C37.20.1, Article 7.1.3.4) for each breaker as indicated.
   g. Provide a blue supervise and amber trip light for each lockout relay. Provide contacts on lockout relays to operate these lights and perform tripping and alarm functions indicated.
   h. The main and tie breakers shall have zone selective interlocking with feeder breakers for phase and ground fault current trip functions.
   i. The main and feeder breakers shall have arc flash reduction maintenance system (ARMS) incorporated in the switchgear.
   j. Each breaker shall include control switches (CS) and indicating lights (GE type ET16 or equal) as shown in control schematics provided.
2. Breaker Control Schemes: Schematic diagrams shall be prepared by Supplier in accordance with the typical control schemes indicated.

E. Alarms: Include remote alarms as indicated on the typical schemes.
   1. Provide a single bell alarm point actuated by overcurrent on any trip unit. This point shall be in addition to the overcurrent trip alarm for each breaker. Breaker shall not be able to close after the bell alarm has operated until the bell alarm has been manually reset.
   2. Wire out alarms from multifunction relays to external terminal blocks for Owner use as shown on control schemes.

2.04 MAINTENANCE EQUIPMENT AND SPARE PARTS:

A. Furnish the following:
   1. One set of special wrenches, removable hand cranks for breaker rack-out and manual spring recharge, maintenance slow closing devices, and breaker lifting spreader for each type of breaker furnished.
   2. Two sets of test plugs for meters, relays, and test switches.
   3. Six spare primary fuses of each voltage and current rating used in the switchgear.
   4. Six spare secondary fuses of each voltage and current rating used in the switchgear.
   5. Four spare indicating lamps of each type.
   6. Four spare indicating lamp resistors of each type.
   7. Two spare indicating lamp color caps of each type and color.

8. Two complete sets of breaker operating coils as required for all frame sizes furnished.
9. One portable test set for testing and field calibration of microprocessor tripping devices.
10. Two breaker element mounted auxiliary switches (52) of each type required.
11. Two breaker position switches (52H) of each type required.
12. Other parts normally furnished by manufacturer.

PART 3 - EXECUTION

3.01 FACTORY TESTS:

A. Perform manufacturer's standard tests and tests as specified in this Section, Item 1.04.
B. Owner will perform other field testing under a separate contract.

3.02 FIELD SERVICES:

A. Bid Price shall include five man-days and one round trip to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.
B. Manufacturer's field representative shall assist installing contractor with assembly and installation of switchgear per Supplier's installation and operation and maintenance manuals.
   1. Inspection of switchgear for damage during shipment and installation.
   2. Makeup of shipping split wiring connections.
   3. Makeup of shipping split bus and enclosure connections.
   4. Verification of final setting of the switchgear lineup per Supplier's requirements.
   5. Coordinate and make installing contractor aware of any additional installation requirements.

Table 1

Device	Manufacturer	Type	Substitute
(1) Lockout Relays	Electroswitch	Type 24 LOR	No
(2) Indicating Lights	General Electric	ET-16 LED Cat. #116B96708 G43	Or Equal
(3) Auxiliary Transformer Protection Relay	Schweitzer	587 Part # 0587006X131	No
(4) Auxiliary Generator Protection Relay	Schweitzer	547 Part # 05470X155XXX2XX	No
(5) Synchronization Check Relay	Basler	BE3-25 Part # BE3-25-1-D-1-N-5	No
(6) Ammeter/Voltmeters	Yokogawa	AB40	Or Equal

END OF SECTION 262300

SECTION 262320 – 480-VOLT SWITCHGEAR AND BUS EQUIPMENT - DATA TO BE SUBMITTED WITH BID

PART 1 - GENERAL:
This Section shall apply to Section 262300 and shall be completed for each switchgear supplied.

1.01 CONFORMANCE TO SPECIFICATIONS:
Contractor shall furnish Equipment and Material conforming fully to the Specifications regardless of any variance indicated by the data in this SECTION.

1.02 OUTLINE DRAWINGS:
A. The Bidder shall submit with the Bid a preliminary outline drawing for each switchgear indicating the following information: _____
1. Overall width. _____
2. Overall depth. _____
3. Overall height _____
4. Attachment locations of base. _____
5. Areas that must be maintained clear. _____

PART 2 - PRODUCTS

2.01 480V SWITCHGEAR:
A. General Information:
1. Manufacturer _____
2. Size, W x D x H, Inches _____
3. Weight, Pounds _____
4. Breaker Element Manufacturer/Model _____
5. Trip Device Model No. _____
6. Does Trip Device Required External Power? _____
7. Number of Bus VT's/Incoming VTs _____
B. Ratings and Performance: _____
1. Main Breaker Rating, A _____
2. Bus tie Breaker rating, A _____
3. Feeder Breaker rating, A _____
4. Horizontal Bus Continuous Rating, A _____
5. Vertical Bus Continuous Rating, A _____
6. Breaker interrupt rating at 480V, kA _____
7. Breaker close and latch rating at 480V, kA _____
8. Bus short circuit withstand rating, kA _____
9. Control Voltage, V DC _____
10. Closing coil current, A DC _____
11 Trip coil current, A DC _____
12. Spring charging current, A DC _____
13. Breaker closing time, ms _____
15. Breaker interrupting time, ms _____
15 Breaker spring charging time, ms _____
16. Number of breaker auxiliary contacts "a" - "b" -
16. Heat Dissipation/Breaker Cubicle, watts 800A -
1600A -

3200A -	
4000A -	
5000A -	

2.02 480V SWITCHGEAR CONSTRUCTION DETAILS:

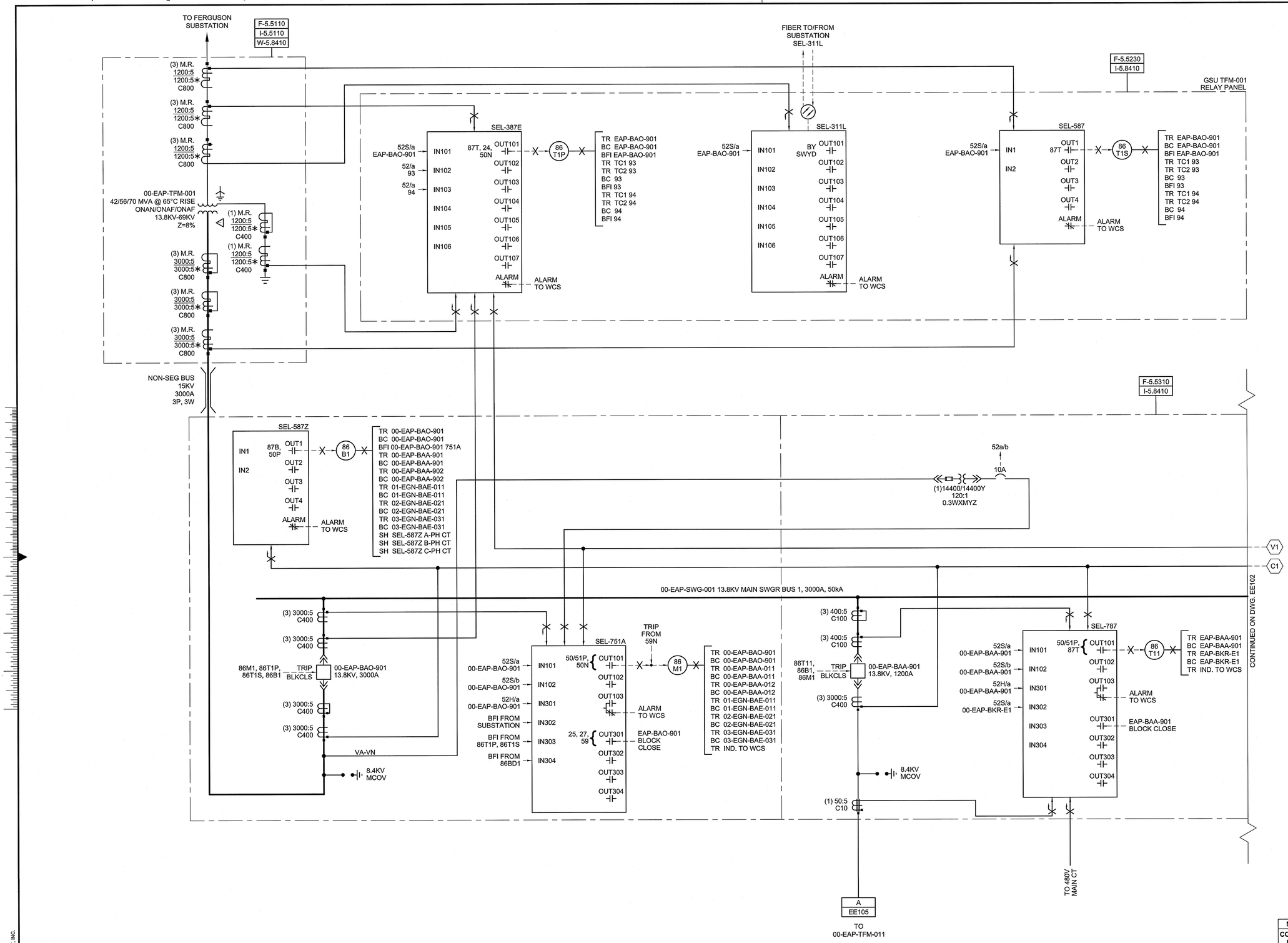
A. Access:			
1. Latching of Breaker Door	Lever	Bolted	
B. Accessories:			
1. Control Switch Model			
2. Indicating Light Model			
3. Meter Model			
4. Number of MOC contacts	“a” -	“b” -	
5. Number of TOC contacts	“a” -	“b” -	
6. DC Breaker Model			
7. Number of heaters/watts/volts	#Heaters	Watts	Volts
8. Breaker Lifting Device Mounted on Top?			

2.05 SHIPPING INFORMATION:

A. Factory of Manufacture			
B. Origin of Shipment			
1. Number of shipping splits			
2. Size of largest shipping split	H=	W=	D=
3. Weight of largest shipping split		lbs	

PART 3 - EXECUTION: Not Applicable.

END OF SECTION 262320



REFERENCE DRAWINGS:

E001	ELECTRICAL LEGEND FOR ONE LINE DIAGRAMS
EE001	OVERALL ONE LINE DIAGRAM
EE102	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE103	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE105	ONE LINE DIAGRAM 480V SWITCHGEAR METERING AND RELAYING

MULTIPLE CONTRACT RECORD BLOCK

CONTR. NO.	CONTRACT NAME	BID ISSUE REV	BID ISSUE DATE
C5310	MV AND LV SWGR	0	1/14/15
C5320	GSU RELAY PANELS	-	-
C8410	ELECTRICAL INSTALL.	-	-

TIMOTHY J O'BRIEN No. 27487 OKLAHOMA 1/14/2015

no.	date	by	ckd	description
0	01/14/15	RAE	TOB	ISSUED FOR BID

Burns & McDonnell SINCE 1898
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. CA-421
06/30/16

designed R. EASTERLING
detailed R. EASTERLING

CITY OF stillwater Electric Utility
STILLWATER, OKLAHOMA

STILLWATER ENERGY CENTER
ONE LINE DIAGRAM
13,800V SWITCHGEAR
METERING AND RELAYING

project 75644
contract C8410
drawing EE101 – rev. 0
sheet 1 of 1 sheets
file 75644_EE101.DWG

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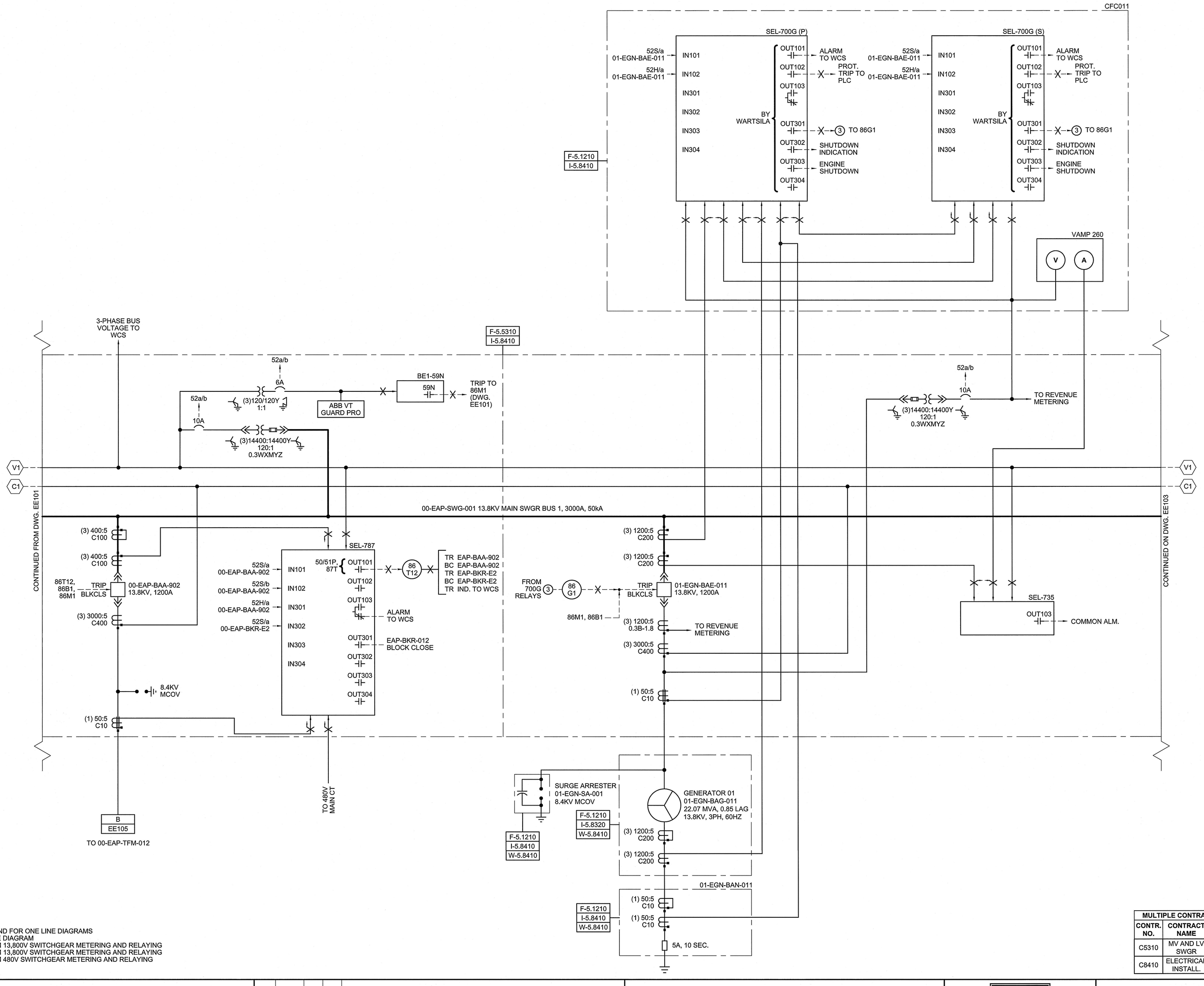

REFERENCE DRAWINGS:

E001	ELECTRICAL LEGEND FOR ONE LINE DIAGRAMS
EE001	OVERALL ONE LINE DIAGRAM
EE101	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE103	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE105	ONE LINE DIAGRAM 480V SWITCHGEAR METERING AND RELAYING

MULTIPLE CONTRACT RECORD BLOCK			
CONTR. NO.	CONTRACT NAME	BID ISSUE REV	BID ISSUE DATE
C5310	MV AND LV SWGR	0	1/14/15
C8410	ELECTRICAL INSTALL.	-	-

no.	date	by	ckd	description
0	01/14/15	RAE	TOB	ISSUED FOR BID

Burns & McDonnell SINCE 1898
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
FIRM LICENSE NO. CA-421
06/30/16

designed R. EASTERLING
detailed R. EASTERLING

City of stillwater Electric Utility
STILLWATER, OKLAHOMA

STILLWATER ENERGY CENTER
ONE LINE DIAGRAM
13,800V SWITCHGEAR
METERING AND RELAYING

project 75644
contract C8410
drawing EE102 – rev. 0
sheet 1 of 1 sheets
file 75644_EE102.DWG

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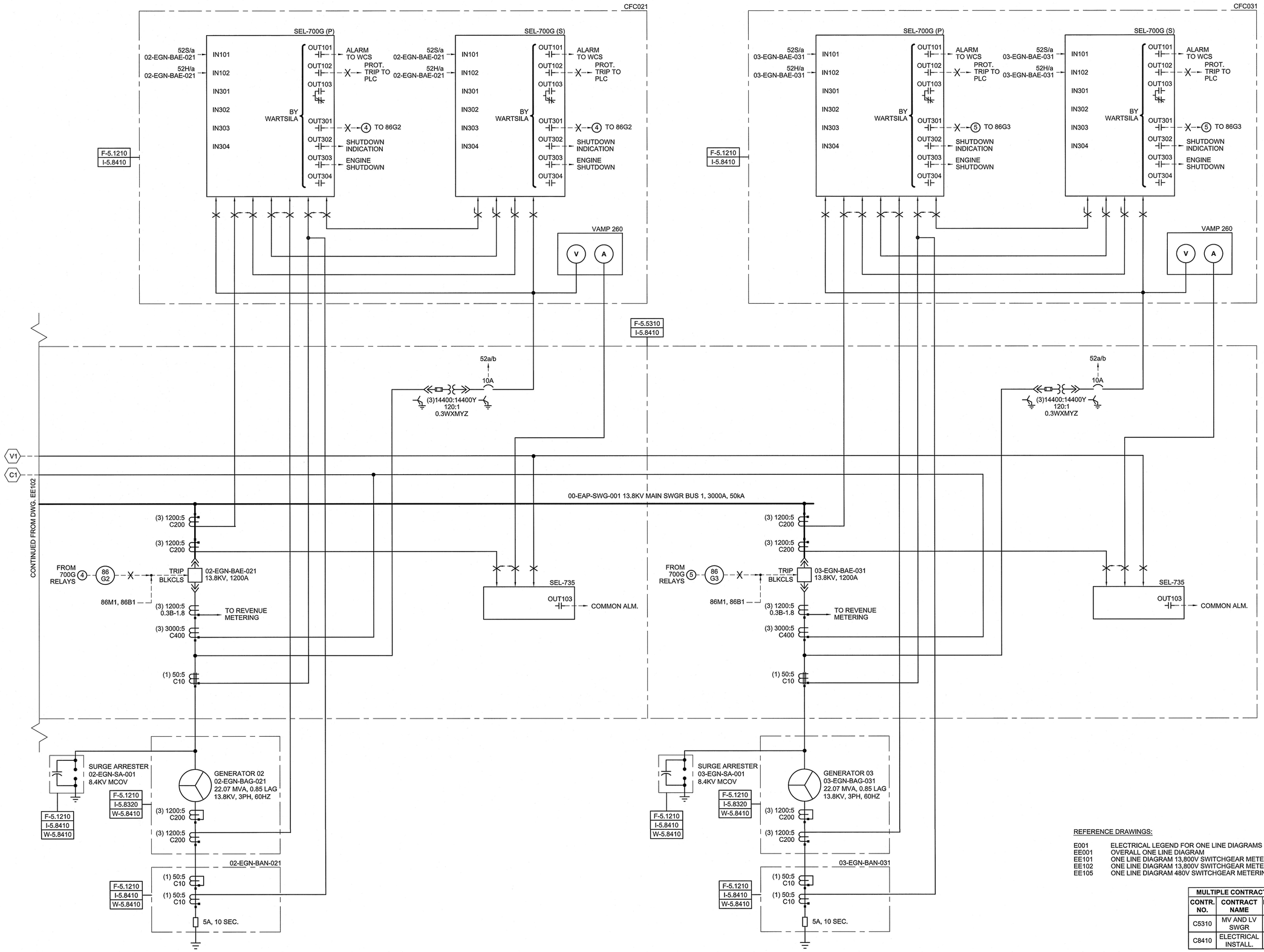

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EE102	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE105	ONE LINE DIAGRAM 480V SWITCHGEAR METERING AND RELAYING

MULTIPLE CONTRACT RECORD BLOCK			
CONTR. NO.	CONTRACT NAME	BID ISSUE REV	BID ISSUE DATE
C5310	MV AND LV SWGR	0	1/14/15
C8410	ELECTRICAL INSTALL.	-	-

TIMOTHY J. O'BRIEN No. 27467 OKLAHOMA 1/14/2015

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STILLWATER ENERGY CENTER
ONE LINE DIAGRAM
13,800V SWITCHGEAR
METERING AND RELAYING

project 75644
contract C8410
drawing EE103 – rev. 0
sheet 1 of 2 sheets
file 75644_EE103.DWG

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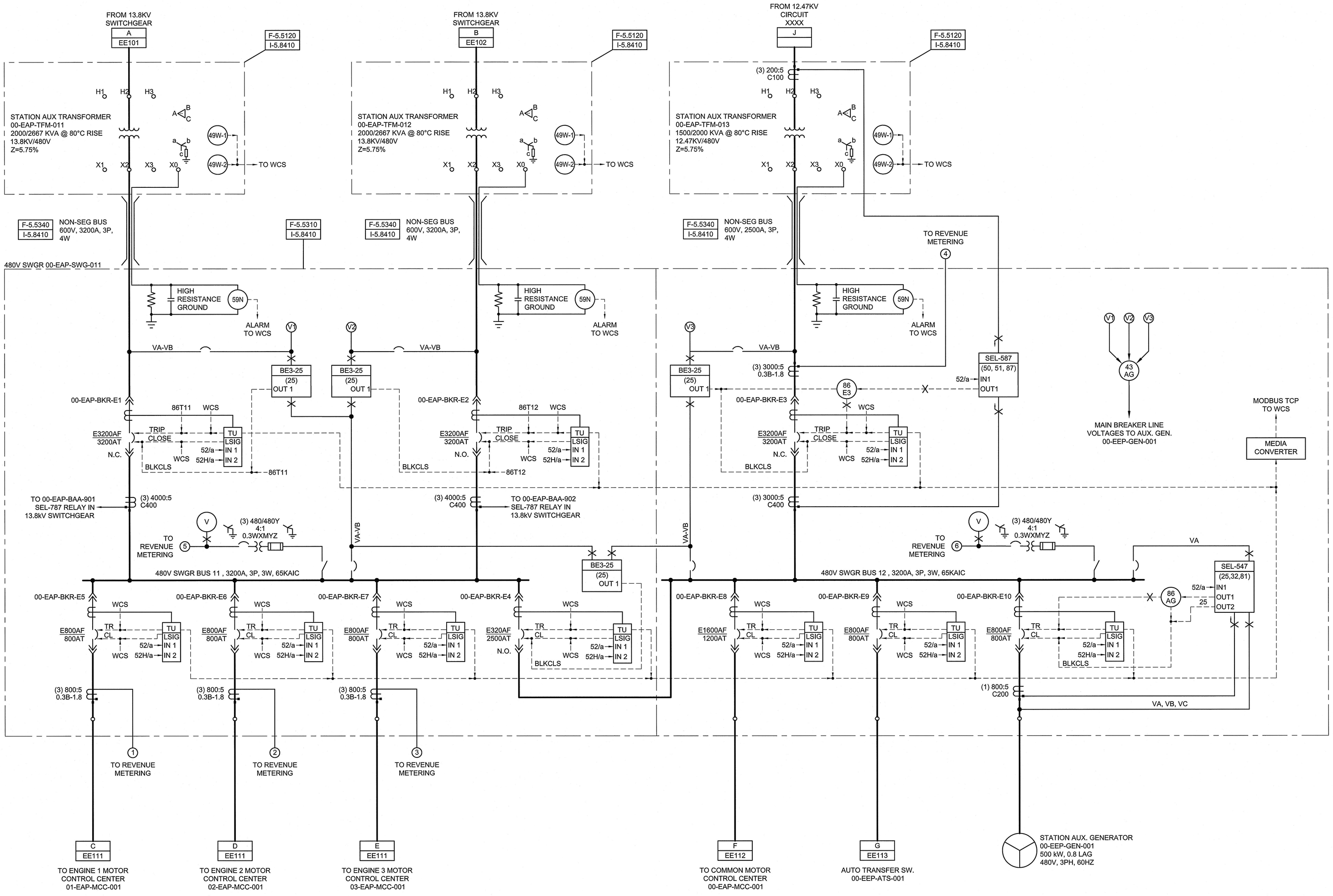

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EE101	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE102	ONE LINE DIAGRAM 13,800V SWITCHGEAR METERING AND RELAYING
EE105	ONE LINE DIAGRAM 480V SWITCHGEAR METERING AND RELAYING

MULTIPLE CONTRACT RECORD BLOCK

CONTR. NO.	CONTRACT NAME	BID ISSUE REV	BID ISSUE DATE
C5310	MV AND LV SWGR	0	1/14/15
C8410	ELECTRICAL INSTALL.	-	-

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1/14/2015

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CITY OF stillwater Electric Utility
STILLWATER, OKLAHOMA

STILLWATER ENERGY CENTER
ONE LINE DIAGRAM
480V SWITCHGEAR
00-EAP-SWG-011 & 00-EAP-SWG-012

project 75644
contract C5310
drawing EE105 – rev. 0
sheet 1 of 2 sheets
file 75644_EE105.DWG

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BURNS & MCDONNELL

Site Specific Safety & Health Plan

Stillwater Electric Utility

Stillwater Energy Center

Project 75644

August 28, 2014

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Chapter A - Health & Safety Policy

At Burns & McDonnell, safeguarding the safety and health of our employees, subcontractors and related personnel is of the utmost importance. Safety is a core value of our culture, and we are dedicated to protecting the safety and health of all those associated with our company.

Our mission is "Make Our Clients Successful." A safe and healthy work environment impacts every measure of a firm's success, from quality of work life to productivity and profitability — our clients' and our own. With many of our staff working full time in client facilities, our safety leadership not only affects the safety and health of our employee-owners, but that of many others influenced by their activities.

We understand that each of us plays a vital role in the completion of work in a safe manner. Employee recommendations to improve safety and health conditions are encouraged, and all will be given thorough consideration by our management team. The goal of our ongoing safety and health program is "zero incidents" on all job sites.

Our goal will be achieved by:

- Commitment to a belief that accidents are preventable.
- Top management's commitment to providing a safe and healthy work environment for all employees by holding management personnel accountable for all aspects of employee safety and health.
- Employee involvement to improve the quality of workplace safety and health.
- This includes brainstorming, inspecting, detecting and correcting, from project startup to project completion.
- Committing auditing resources to detect hazards and ensure hazard correction.
- Ensuring that all employees and subcontractors have the knowledge and training to accomplish the task ahead.
- Providing all employees and all job sites with appropriate, state-of-the-art equipment to get the job done.
- Recognition that safety does not start at the job site, but with executive management.

Burns & McDonnell's safety record puts us in the top 5% of all contractors nationwide. However, we are determined not to rest upon past successes, but to use those successes as a foundation for continual improvement in making us truly, "World Class".

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    - Director of Corporate Safety & Health
    - Project Manager
    - Site Manager (Project Superintendent)
    - Subcontract Site Manager (Project Superintendent)
    - Competent Person
    - Designated Safety Representative

Project Safety & Health Goals

Introduction

The Burns & McDonnell Project Safety & Health Program is a framework designed to coordinate the safety & health efforts of Burns & McDonnell employee owners, all Subcontractors and lower tier Subcontractors to Burns & McDonnell on the project in a consistent manner. Each Subcontractor is required to develop and implement a Project Specific Safety & Health Program. The Burns & McDonnell Project Safety & Health Program in no way relieves Subcontractors and lower tier Subcontractors of legal obligations to any local, state or federal laws, regulations or requirements.

The following information provides the safety requirements that all Burns & McDonnell employee owners adhere to. These requirements are the minimum standards for Burns & McDonnell personnel and that Subcontractors to Burns & McDonnell shall implement in their Project Specific Safety & Health Program.

Project Safety & Health Goals
ZERO work-related injuries and illnesses is the highest priority of Burns & McDonnell. Burns & McDonnell is committed to safely constructing a project that is built on time and within budget. Success on this project, for the safety & health of the working individuals, will be achieved by reporting a zero (0) TRIR (Total Recordable Incident Rate) and a zero (0) DART (Days Away, Restricted, and Transferred) rate for work-related injuries and illness. As with all Burns & McDonnell projects, the avoidance of any occupationally related deaths or serious injuries is of the highest priority. [Refer to either the BURNS & MCDONNELL Safety Form B-7 "Classification of Injury" or the BURNS & MCDONNELL Safety Form C-2 "Incident/Accident Investigation Report" for information on what constitutes an OSHA recordable injury or illness,

C2 Incident Form.doc

B-7

By creating an atmosphere which minimizes hazards in the work environment, Burns & McDonnell feels a quality product can be easily produced allowing delivery of the finished product on time and within budget to **CITY OF STILLWATER**.

Project Safety & Health Program

Burns & McDonnell employee owners are responsible for knowing and following established safety procedures that are applicable to performing their jobs safely. All Burns & McDonnell employee owners attend a one-hour General Safety & Health Orientation class. At that time the employee owners are notified that individuals performing fieldwork are required to attend the 10-Hour OSHA Safety Course. No employee owner is to work in any area or under any circumstances where OSHA violations or other known hazards exist until the controlling Subcontractor has taken proper corrective action. Furthermore, **CITY OF STILLWATER** facilities are obligated by law to inform visitors of potential site hazards prior to working at the site. Initial Site Specific Safety & Health Orientation training is required prior to beginning work activities.

Project Site Safety & Health Program
The Project Safety & Health Program is tailored for this work site. The program is available to, and is to be followed by, all workers entering a work site where Burns and McDonnell is the general contractor. All Burns & McDonnell employee owners who will be working at the site are required to review and adhere to

this program before beginning work. All Subcontractor workers shall be trained by the Subcontractor on the contents of their company's Project Specific Safety & Health Program that must include the requirements set forth in this program.

All work site personnel, including Burns & McDonnell employee owners and Subcontractors, will familiarize themselves with the contents of the Project Safety & Health Program and apply it during work activities. Furthermore, all project personnel are required to participate in the project's Project Site Specific Safety & Health Orientation Training and to sign the Project Orientation Training form, BURNS & MCDONNELL Safety Form C-8 "Orientation Training", acknowledging participation in the training prior to performing any work on the project. This documentation is required with a time, date and signature of the individual to verify an understanding of the Project Safety & Health Program. Unless otherwise established, all Subcontractors to Burns & McDonnell are responsible for administering project orientation training for their workers. Safety is the responsibility of everyone on site, requiring everyone to work together to achieve a safe workplace.

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Visitor(s) accessing the site for less than an eight (8) hour period will not be required to attend the Project Orientation Training. Visitor(s) shall be accompanied by an authorized person - one who has been trained on the project hazards and who is familiar with the project throughout the entirety of his/her visit. If the visitor(s) cannot be accompanied by an authorized individual throughout the entirety of the visit, the visitor(s) shall attend the Project Site Specific Orientation Training prior to accessing any work activity area.

General Liability Program

The Subcontractor and all lower tier contractors shall take all necessary precautions to protect the public, the facilities, the personnel and tenants of **CITY OF STILLWATER** from any hazards involving safety & health arising from the scope of work. All work operations shall be isolated from the public and **CITY OF STILLWATER**'s operations to the greatest extent possible. The owner's discretion and interpretation of abatement methods and procedures will be the defining opinion

Key Personnel and Responsibility Roles

Purpose: The following information defines the obligations and requirements of key personnel for Burns & McDonnell and for Subcontractor personnel who play a vital role in the Project Safety & Health Program.

Any person on site may shut down a work operation that poses imminent danger or a situation arises which is immediately dangerous to life or health on site. When such precautions must be immediately taken, the Site Manager (Project Superintendent) shall be immediately notified and actions to remedy the situation shall be implemented.

Burns & McDonnell

Global Practice Manager

The Global Practice Manager is responsible for making the decision on how to staff the project regarding the need for a full-time Safety & Health Professional. The Global Practice Manager along with the Project Manager is responsible for ensuring that the standard contract language is used and that safety & health requirements are met to assure Subcontractor safety & health submittals are in compliance with this Project Safety & Health Program.

Standard Contract Language

The Global Practice Manager is responsible for assuring that the Project Manager, Site Manager and all site personnel adhere to this Project Safety & Health Program and all local, state and federal rules, regulations and procedures regarding safety and health. The Global Practice Manager will utilize the Director of Corporate Safety & Health to evaluate the Project Safety & Health Program and the performance of Project Management. The Global Practice Manager's responsibilities will also include the following:

1. Provide the leadership, commitment and support necessary to achieve compliance with the Project Safety & Health Program.

2. Sell the customer and Subcontractors on the value to all parties of a well-executed safety program.

3. Require safety statistical reports to be submitted to Burns & McDonnell as required by contract.

4. Communicate the customer's safety, health and loss control requirements to project management and the Director of Corporate Safety & Health.

5. Provide leadership, authority and decisiveness in dealing with noncompliance with the program up to and including termination of Subcontractor and/or project management members for the project.

6. Require project management to hold Subcontractors responsible and accountable for safety compliance on the project site with the Project Safety & Health Program.

Director of Corporate Safety & Health

The Director of Corporate Safety & Health is responsible for providing professional safety & health support and oversight to the project management team. The Director of Corporate Safety & Health will review and provide support in all concerns regarding the safety & health of field personnel assigned to this project. The Director of Corporate Safety & Health, or his designee, will conduct field audits of the project work site and programs to evaluate the adequacy of the Project Safety & Health Program. The Director of Corporate Safety & Health will implement necessary changes through the Site Manager.

The Director of Corporate Safety & Health, or his designee, will provide professional support by reviewing Safety & Health Programs of Subcontractors (when there is not a full-time Site Safety & Health) and will assist the project management in complying with the Project Safety & Health Program and all other rules, regulations and procedures which apply to the project. The Director of Corporate Safety & Health responsibilities shall also include the following:

1. Along with the Global Practice Manager and the Project Manager, establish the correct contract language with regard to the requirements of the Project Safety & Health Program.

2. Assist the Global Practice Manager and Project Manager in determining staffing and facility needs with regard to Project Safety & Health.

3. Direct the distribution of safety regulations and safety material.

4. Act as a safety resource advisory capacity for the organization and generate periodic improvements/revisions to the Project Safety & Health Program as needed.

5. Include materials necessary for Subcontractors to properly bid the project during pre-bid meeting.

6. Perform periodic project assessments to evaluate the Project Safety & Health Program and performance of the project management team as well as Subcontractors to Burns & McDonnell. The occurrence of these assessments will vary depending on the necessity for on site evaluation. At a minimum, the project will be assessed quarterly.

7. Communicate safety concerns and coordinate corporate safety requirements with the Corporate Safety & Health Department.

Project Manager

The Project Manager is responsible for communicating with the Director of Corporate Safety & Health in order to have a Project Safety & Health Program established. The Project Manager shall oversee the activities of the Site Safety Manager Management Team (The Burns & McDonnell employee owners who manage the project at the physical location of the site) in order to assure adherence of the Project Safety & Health Program. The Project Manager, along with the Director of Corporate Safety & Health, will be responsible for designating a Field Safety & Health Professional for the project. The Project Manager's responsibilities shall also include the following:

1. Communicate customer safety, health, and loss control requirements to project team.

2. Schedule and participate in pre-activity planning meeting for project.

3. Assist in monitoring compliance with Project Safety & Health Program.

4. Provide leadership, authority, and decisiveness in dealing with noncompliance of the Project Safety & Health Program up to, and including, termination of the Subcontractor from the project.

5. Evaluate and use withholding of payment to Subcontractor or other contract remedies, including termination of contract and removal of the Subcontractor from the site when this safety program is being violated.

6. Give on-going input into necessary changes to this safety program.

7. Hold Subcontractors accountable and responsible for compliance with the Burns & McDonnell Project Safety & Health Program.

8. Assure Burns & McDonnell employee owners have in their possession at the job site, the necessary safety equipment such as fall protection safety harnesses and lanyards, hard hats, safety glasses, safety shoes and other safety equipment and require their use as needed.

9. Plan ahead for safety so that appropriate safety equipment and safety systems are on hand and readily available when needed by Burns & McDonnell employee owners.

Site Manager (Project Superintendent)

The Site Manager is the on-site coordinator and overseer of operations. It is the duty of the Site Manager to see to the maintenance of site security, the coordination of activities by the Subcontractors, and to verify that all activities are performed in a safe manner. The Site Manager is responsible for the safety & health practices and conditions on site. Any Safety & Health Professionals or supervisors provided by Subcontractors shall be utilized as a resource by the Site Manager to optimize performance on site with regard to safety & health. The Site Manager's responsibilities shall also include the following:

1. The Site Manager shall ensure all personnel of Subcontractors to Burns & McDonnell are in compliance with safe work practices and attend all required safety & health training.

2. Give on-going input into necessary changes to this Project Safety & Health Program.

3. Hold Subcontractors responsible and accountable for compliance with the Burns & McDonnell Project Safety & Health Program as well as their own Project Specific Safety & Health Program.

4. Attend and provide input into the pre-construction safety planning meeting.

5. Schedule and attend weekly Safety & Health meetings presented by the Safety & Health Professional.

6. Require submittal of a written plan from all Subcontractors regarding how work processes will be safely performed, such as temporary bracing, (activity hazard analysis).

7. Obtain a master copy of the Burns & McDonnell material safety data sheets (MSDS) compilation and start job specific files for MSDS' for the project as submitted by Subcontractors.

8. Take prompt action up to and including termination of the Subcontractor from the project site to correct unsatisfactory conditions and work practices personally observed or brought to your attention which involve our Subcontractors or employee owners. Whenever a violation of the safety program occurs and requires correction, document the demand for correction utilizing the BURNS & MCDONNELL Safety Form B-1 "Violation Notice" to the Subcontractor and Project Manager. Unsafe situations which involve Subcontractors not under Burns & McDonnell control should be brought to the attention of the responsible client party and documented. Immediately discontinue work around the unsafe area until concerns are properly addressed.

   B-1

9. Assure that all injuries are reported and treated.

10. Require reports and investigations of all near misses, incidents and accidents.

11. Assure that OSHA recordkeeping requirements are maintained.

12. Various safety activities may be delegated to others, but the ultimate implementation and monitoring of safe work techniques are the responsibility of the Site Manager (Project Superintendent).

13. Assure Burns & McDonnell employee owners have in their possession the necessary protective and safety equipment such as fall protection safety harnesses and lanyards, hard hats, safety glasses, safety shoes, and other safety equipment, and require their use as needed.

14. Plan ahead for safety so that appropriate safety equipment and safety systems are on hand and readily available when needed by Burns & McDonnell employees.

15. Complete job safety walk-through assessments. Cover the findings of the walk-through with the accompanying Subcontractor. Follow up by documenting the items which require immediate correction.

Site Safety Professional

1. Provide full-time support in the field to assure operations are planned and conducted in a safe manner.

2. Provide advice, guidance, and assistance to personnel involved in our projects regarding safety and health issues and work practices. Identify unique safety & health issues by project, before the project begins, for resolution.

3. Interface with **CITY OF STILLWATER** Safety & Health Department on site safety & health issues and coordinate pro-active measures.

4. Coordinate and mentor project safety & health walk-through assessments. Cover the findings of the walk-through with the accompanying Subcontractor. Follow up by documenting the items which require immediate correction.

5. Periodically distribute information and updating memos relative to safety, including assisting with safety memorandums.

6. Conduct on-going training on safety & health subjects.

7. Review Incident/Accident Investigation reports (including Near Misses) and recommend corrective measures as appropriate.

8. Report to Corporate Safety & Health periodically regarding the Project Safety & Health Program progress, problems, and objectives.

9. Organize and help conduct safety training as necessary.

10. Fully utilize the assistance of our insurance carrier, OSHA, safety organizations, and other resources.

11. Complete BURNS & MCDONNELL Safety Form B-2 "Daily Field Safety & Health Report" and submit weekly to the Manager of Field Operations Safety & Health.

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Subcontractor

Purpose:

Subcontractors are responsible for administering the Project Specific Safety & Health Program developed by the Subcontractor which incorporates the text of this document as a minimum standard. Subcontractors are responsible for the training of workers, safety inspections, necessary safety documentation and coordinating of work for safe means through Burns & McDonnell and other Subcontractors on this project. For this reason, the following roles have been developed that each Subcontractor shall designate and comply with:

Subcontractor Site Manager (Project Superintendent)

The Subcontractor Site Manager shall have final authority and responsibility for the administering the Project Specific Safety & Health Program. The Site Manager may delegate these duties to persons qualified to administer the program. However, the Site Manager will still be responsible for assuring adherence of the Project Specific Safety & Health Program and for disciplining workers who violate the Project Specific Safety & Health Program requirements. The Subcontractor Site Manager is subject to dismissal from the project for the duration of the project for failing to properly administer the Project Safety & Health Program. This decision will be at the discretion of Burns & McDonnell and the owner.

Competent Person

OSHA requires a competent person be designated for particular activities who can recognize hazards or potential hazards and who has the authority to correct or abate the hazard. For this reason, the Competent Person should be identified on the Activity Hazard Analysis when applicable to the activity. The competent persons for all of the subcontractor project activities shall be submitted by each subcontractor prior to the start of project site activities, using BURNS & MCDONNELL Safety & Health Form C-17 "Competent Person Designation".

C-17

OSHA defines a Competent Person as 'One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees *and* who has authorization to take prompt corrective measures to eliminate them'.

Designated Safety Representative

Subcontractors shall designate a qualified safety representative to be responsible for the administration of the Subcontractor's Safety Programs, the Project Specific Safety & Health Program and all **CITY OF STILLWATER** requirements and procedures. This person shall be qualified to identify hazards and have the authority to correct them, coordinate safe work efforts and submit all required documentation to Burns & McDonnell. The Subcontractor shall inform Burns & McDonnell in writing who will be designated to fulfill these obligations utilizing the BURNS & MCDONNELL Safety Form B-3 "Subcontractor Verification".

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Chapter C - General Safety

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Program Administration

Purpose: Program administration is one of the key elements in communicating and coordinating site activities and Safety & Health obligations. For this reason, activities and procedures have been established to ensure all persons on site shall work in a safe and healthful environment where activity is coordinated and organized.

1. Project Safety & Health Program

   Copies of the Project Safety & Health Program will be included in the Subcontractor bid packages. Each Subcontractor shall keep a copy of the Project Safety & Health Program in their company's on-site facilities. The Subcontractor is responsible with training and familiarization of their workers and their Subcontractor's workers with the minimum requirements set forth in this manual and any changes which are made to it.

2. Project Safety & Health Coordination Meetings

   At the time of the Weekly Project Site Coordination Meeting, Project Safety & Health Coordination will also be discussed. At this weekly meeting up to date Subcontractor work hours shall be submitted as well as other safety & health statistics BURNS & MCDONNELL Safety Form C-1 "Weekly Work Hour Report". Allotted time shall be, up to two hours attendance by the Subcontractor Safety & Health representative, for Burns & McDonnell to specifically address safety, health and coordination concerns with the Subcontractors. This time shall also serve as a forum for Subcontractors' to discuss safety & health concerns as related to each other and the project. Burns & McDonnell will facilitate any concerns between Subcontractors and will assist in finding adequate solutions.

   C-1

3. Reporting Requirements

   All incidents /accidents shall be immediately (within three minutes) communicated to Burns & McDonnell. BURNS & MCDONNELL Safety Form C-2 "Incident/Accident Investigation Report" shall be submitted within twenty-four (24) hours of the incident. A copy of any supportive material utilized in the investigation shall also be submitted along with the report (i.e. photographs, drawings and witness statements).

   C2 Incident Form.doc

   All "recordable" accidents, deaths or incidents involving significant equipment damage, facility damage or **CITY OF STILLWATER** property damage shall be immediately communicated to the Site Safety & Health Professional and the Site Manager. If the Site Safety & Health Professional or the Site Manager is not available, notify any Burns & McDonnell employee.

   A summary of the safety & health statistics for each Subcontract company BURNS & MCDONNELL "Monthly Work Hour Report" Safety Form C-3 shall be submitted by the fifth working day of each month for the previous month's total man/hours and review of incidents from that month.

C3

4. Project OSHA Procedure
   a. When is Burns & McDonnell required to notify OSHA?
      It is the responsibility of the Director of Corporate Safety & Health to notify OSHA within 8-hours of a workplace accident that results in a fatality or a hospitalization of three or more worker from the same event.

      The location and time of the accident, along with the number of fatalities or hospitalized employees, the name and phone number of a contact person, and a brief description of the accident will be required in the notification.

      You may contact OSHA through your area office which can be located using the following hyper-link: http://www.osha.gov/html/RAmap.html

      After hours you should contact OSHA via: 1(800) 321-OSHA
   b. Upon Arrival of the OSHA Compliance Safety & Health Officer, CSHO: Immediately notify Burns & McDonnell Corporate Safety & Health (816) 333-9400.
      (i) Before the CSHO arrives at the facility, security, receptionists, or anyone responsible for letting people enter the facility must know to immediately contact the Site Manager in the event of an OSHA inspection.
      (ii) The Site Manager or his/her designee must accompany the CSHO throughout the entire inspection process.
      (iii) The CSHO's credentials must be checked before inspection begins. If there are doubts about the validity of the credentials, contact the nearest area OSHA office.
      (iv) Ask the CSHO the reason for the visit. Reasons for an OSHA inspection may include:
         (A) a fatality or serious injury
         (B) imminent danger
         (C) a complaint
         (D) a general scheduled inspection
         (E) special emphasis inspection
   c. Opening Conference:
      (i) During the opening conference, the CSHO will inform the designated representatives that the official purpose of the visit is to ascertain if the facility is in compliance with the requirements of the OSH Act. Other topics that should be discussed are:
         (A) the scope of the inspection
         (B) records that need to be reviewed
         (C) a physical inspection
         (D) obligation to privately interview employees
      (ii) The CSHO must also show a copy of the complaint if one was made.
      (iii) The following information must be readily available for the CSHO's review
         (A) OSHA 300, 300A forms (current and past years). The blank 300 forms may be acquired via the following hyper-link:
            http://www.osha.gov/pls/publications/pubindex.list#300

         (B) Company safety programs (including but not limited to):
            (1) Lockout/Tagout
            (2) Confined Spaces
            (3) Fall Protection

(4) Emergency Procedures
(5) Hazard Communication Program

(C) The OSHA poster must be posted in a conspicuous location. The OSHA poster can be printed using the following hyper-link.
http://www.osha.gov/Publications/osha3165.pdf

d. Walk around Inspection:
(i) During the walk-around inspection, it is required that a Burns & McDonnell representative accompany the CSHO at all times. Those accompanying the CSHO are to make sure that the inspection stays within the intended scope of the investigation that was discussed in the opening conference. The inspection should not expand outside of this scope.
(ii) The CSHO may also have instruments for taking measurements such as air samples, noise samples, or illumination surveys. The Burns & McDonnell representative should perform side by side sampling with the CHSO whenever possible and take notes of the locations and conditions discovered during sampling by the CHSO.
(iii) All violations will be documented by the CSHO. Once documented, the CSHO will bring the violations to the attention of the Burns & McDonnell representative. The Burns & McDonnell representative should also make identical notes of the violations that the CSHO cites.
(iv) The Burns & McDonnell representative should also correct any violations that he/she comes across during the inspection.
(v) Never admit to a violation or bring a violation to the attention of the CSHO.
(vi) When the CSHO takes any photographs or videos of the facility, the Burns & McDonnell representative should take the identical picture for their records.
(vii) The CSHO may also conduct private employee interviews. The employee may ask for another representative to accompany them with the interview, but it is the discretion of the CSHO whether it is to be allowed.
(viii) After the inspection, the Burns & McDonnell representative should ask the interviewed employee about the content of the interview, and how the questions were answered.

e. Closing Conference:
(i) All personnel who attended the Opening Conference shall attend the Closing Conference.
(ii) The CSHO will describe the suspected violations discovered during the inspection.
(iii) The CSHO will also inform that citations may be issued for suspected violations and that penalties may be proposed for each.
(iv) The CSHO will then attempt to gather an estimate on how long it will take for the alleged violations to be abated. This estimate will be taken into consideration when the CSHO decides on recommended time for abatement.

f. Follow-up Inspections:
(i) OSHA may conduct a follow-up inspection if the citations involve imminent danger, a serious offense, or a repeated offense. The follow-up inspection will usually just involve the areas that were cited. All of the same rules for the original inspection apply in the follow-up inspection.

g. After the Inspection: When the CSHO leaves the facility, the following items must be accomplished:
(i) Update Corporate Safety & Health to discuss further actions.
(ii) Fill out BURNS & MCDONNELL Safety Form C-4 “Regulatory Contact Report” and forward it to Corporate Safety & Health.

C-4

(iii) Debrief employees that may have been interviewed by the CSHO.
(iv) Correct any deficiencies.
(v) Document corrections.

5. Project Safety & Health Procedure Issuances
Burns & McDonnell reserves the right to issue Project Safety & Health Procedures which affect all Subcontractors on site. These procedures will be issued to all persons who have received a copy of the Project Safety & Health Program. An effective date and expiration date will be included to indicate the start and duration of the procedure.

Safety & Health Monitoring and Enforcement

1. Procedure

Each Subcontractor is responsible for managing its own Project Specific Safety & Health Program and related programs. Subcontractors are also responsible for monitoring and enforcing the project disciplinary procedures, or disciplinary procedures which are more stringent, for workers performing non-conformance work in relation to Safety & Health. Subcontractors shall monitor the work of their workers to assure the worker's actions do not create an unsafe condition which may result in harm to themselves, other persons on site or result in property damage.

Failure of Subcontractor management to enforce the disciplinary procedures established in this manual may result in disciplinary action taken against Subcontractor management by Burns & McDonnell.

2. Monitoring

The enforcement of the Burns & McDonnell Project Safety & Health Program (an outline of Subcontractor minimum requirements) and all related local, state, federal or otherwise stated safety & health rules, regulations and procedures is a vital aspect to achieving a safe and healthful work environment. For this reason, Burns & McDonnell will monitor the activities of the Subcontractors on site and enforce all aspects of the Burns & McDonnell Project Safety & Health Program.

Project Safety & Health assessments shall be performed periodically (refer to BURNS & MCDONNELL Safety Form QSA Physical and QSA Documentation). All findings shall be immediately corrected with written verification (Safety Form QSA Action Items) of the corrections submitted to the Burns & McDonnell Site Manager within the abatement date.

QSA Jobsite Physical Evaluation rev2.doc
QSA Documentation Evaluation rev0.doc
QSA Action Items rev0.doc

3. Enforcement

Subcontractors are responsible for enforcing all Safety & Health procedures adopted on this project. Burns & McDonnell will take disciplinary action against Subcontractor management for failing to enforce such procedures. The following actions may be taken against Subcontractor management and personnel for non-compliance issues:

Verbal instruction may be used at the discretion of the designated Safety Manager for conditions or practices which are less than serious and are not likely to cause an accident or incident. Violations may fit into four classes defined as follows:

a. Non-serious – Any condition or practice which is not likely to cause death or serious physical harm to any person.
b. Serious – Any condition or practice which is causing or likely to cause death or serious physical harm to any person.
c. Stop Work/Imminent Danger – The existence of any condition or practice which would reasonably be expected to cause death or serious physical harm before such condition or practice can be corrected. This is a "stop work" situation. All persons shall be withdrawn from the affected area, and no one is allowed into the area except those people deemed necessary to correct the unsafe condition or practice and who are using the necessary controls to safeguard themselves from the hazard.
d. Repeat – Violations which have been verbally stated or written to an employee or Subcontractor more than once.

Abatement of Safety & Health violation notices BURNS & MCDONNELL Safety Form B-1 "Violation Notice" shall take place within the allotted time given to abate the unsafe condition. If the Subcontractor fails to comply with the abatement procedure within the allotted time period, without submittal of an alternate solution, Burns & McDonnell may take corrective action procedures and back charge expense to the Subcontractor who created the unsafe condition.

B-1

All Subcontractors on site shall have a violation policy and procedures that shall meet, at a minimum, the following standards:

4. Violation Procedure (Individuals)

Violations issued are subject to the OSHA regulations which regulate work sites, the Subcontractor Safety & Health Program and the Burns & McDonnell Project Safety & Health Program. The possible consequences subjective to the violation are as follows:

a. Non-Serious Violations
   (i) First Offense is verbal warning. With log book documentation for future reference.
   (ii) Second Offense is written warning.
   (iii) Third Offense is time off project or dismissal.
b. Serious Violations and Repeat Violations
   (i) First Offense is subject to time off project or dismissal at the discretion of the Site Manager and/or the Site Safety Manager.
   (ii) Burns & McDonnell reserves the right to request the dismissal of project personnel who commit serious or repeat safety or health violations.

5. Violation Procedure (Company)

Violations issued are subject to the OSHA regulations which regulate work sites, the Subcontractor Safety & Health Program and the Burns & McDonnell Project
Safety & Health Program. Notice of violation will occur via BURNS & MCDONNELL Safety Form B-1 "Violation Notice". Violation Notices will be logged in BURNS & MCDONNELL Safety Form C-15 "Violation Log".

C15 B-1

Subcontractor Project Safety & Health Coordination and Submittal Requirements

Purpose: Burns & McDonnell has implemented coordination measures and submittal requirements in order to assure the protection of all persons on site and to communicate activities which are being performed on the project. For this reason, those requirements are outlined in the following section so that all Subcontractors are keenly aware of the Project Safety & Health Program Minimum Requirements. These requirements are to be adhered to by Burns & McDonnell employee owners. For help in meeting these requirements refer to BURNS & MCDONNELL Safety Form C-20 "Safety Submittals". The following procedures shall be developed and implemented into the Subcontractor Safety & Health Program for this project.

C-20

The Subcontractor shall be responsible for coordination of its work and that of its Subcontractors so that safe work practice is achieved. The Subcontractor shall coordinate all work provided under this agreement with all contiguous contracts and work activities whether provided by facility staff or Subcontractors. Subcontractor shall arrange and schedule the operation of its own work and the work of all Subcontractors so that delays will be avoided when safe work measures are implemented. No extra payment shall be made for any delays incurred from improper coordination of this work with other trade work and compensation for any such delays and all extra work related thereto is considered as having been included in the contract price.

1. Pre-Mobilization Submittals - Prior to Subcontractor Mobilizing on Site

   Purpose: The following requirements shall be submitted to Burns & McDonnell prior to the start of activities on the project. Program submittals are necessary to coordinate the requirements established in the Subcontractor's Project Specific Safety Program along with the Project Safety & Health Program. It is also necessary for Burns & McDonnell to know who will carry out the functions required by the Project Safety & Health Program and the designated competent persons BURNS & MCDONNELL Safety Form C-17 "Competent Person Designation" for each of the activities.

   C-17

   a. Safety & Health Program

      Submittal of Subcontractor's written Project Specific Safety & Health program to Burns & McDonnell shall be done prior to the start of work. The Project Specific Safety & Health program shall include the requirements outlined in this program as minimum standards. In addition to the written Project Specific Safety & Health program, the following program's shall also be established, submitted and implemented on the project by the Subcontractor, when applicable, if not already included in the Subcontractor's Project Specific Safety & Health program:

      (i) Hazardous Energy Control - Lockout/Tagout Procedures
      (ii) Confined Space Entry Procedures
      (iii) Hazard Communication Program
      (iv) Fall Protection Plan

Subcontractors that do not have a written Project Specific Safety & Health Plan may adopt the verbiage located in the Project Safety & Health Rules as Subcontractor's Project Specific Safety & Health Plan for the exclusive use of this project. Burns & McDonnell is in no way responsible for use and/or interpretation of the Burns & McDonnell Project Safety & Health Program when utilized by Subcontractor. Subcontractor must submit in writing to Burns & McDonnell of the intent for Subcontractor to utilize the Burns & McDonnell Project Safety & Health Program as own for the project. The BURNS & MCDONNELL Safety Form B-3 "Subcontractor Verification" can be utilized to fulfill this obligation.

B-3

Burns & McDonnell is not responsible for administering the Subcontractor Project Safety & Health Program or safety training any Subcontractor personnel after adoption for the project.

2. Pre/Post-Activity Coordination & Submittal Requirements

Purpose: Certain activities pose hazards that require safe work considerations prior to the activity being conducted. For this reason, Burns & McDonnell has established pre/post-activity requirements to assure Burns & McDonnell personnel and/or the Subcontractor consider hazards prior to the start of the activity. These requirements are outlined below:

a. Permit Required Confined Space Entry

Confined Space entry procedures shall be established by the Subcontractor for entry of their personnel. BURNS & MCDONNELL Safety Form C-6 "Confined Space Request" shall be completed and submitted to Burns & McDonnell prior to entry. It is pertinent for Burns & McDonnell to know this information so that coordination efforts may be properly conducted for any other Subcontractor personnel to enter the confined space. Confined Space procedures for entry of Burns & McDonnell personnel can be found in Chapter G.

C-6

b. Crane Inspection and Lift Plan Submittal:

An annual third party crane inspection shall be conducted and shall be submitted to Burns & McDonnell prior to the use of any crane on site. This inspection shall be performed by a qualified crane inspector or by a certified inspection service.

This procedure shall in no way eliminate any requirements set forth for crane inspections in the OSHA Standard 1926.1412.

Lift plans shall be completed for all lifts that are over 20 tons, lifts that involve more than one crane or the load to be lifted exceeds 75% of the manufacturer's load rating chart for configuration of the crane. BURNS & MCDONNELL Safety Form N-2 "Critical Lift Plan" shall be used to document this information.

N-2

(i) Excavations and Trenching

BURNS & MCDONNELL Safety Form J-1 "Site Specific Excavation Plan" shall be completed by the Subcontractor and submitted to Burns & McDonnell prior to the start of the operation. For trenches and excavations over twenty (20) feet in depth, the Subcontractor

shall have a Professional Engineer, who is registered in the state of the project, design the sloping, shoring or shielding method used.

J-1

Soil shall be treated as Class C with regards to the dimensions for sloping, shoring and benching unless BURNS & MCDONNELL Safety Form J-3 "Soil Classification" has been completed by a competent person and transmitted to Burns & McDonnell.

J-3

(ii) Work Notice

Work permits shall be issued by **CITY OF STILLWATER** Representative before commencing any work activity and must be posted in the immediate area where the work is being done. BURNS & MCDONNELL Safety Form C-7 "Work Permit"

C-7

(iii) Lockout/Tagout Procedures

Subcontractors are responsible for administering their own lockout/tagout procedures and program while equipment is under the control of the Subcontractor.

The Subcontractors shall coordinate any work that involves existing or permanent site equipment and all start-up processes involving Burns & McDonnell. The project lockout/tagout program shall be utilized in these circumstances along with any requirements set forth by the **CITY OF STILLWATER** Training documentation of all employees affected in the Lockout/Tagout process may be required to be submitted to Burns & McDonnell prior to the beginning of the activity. Burns & McDonnell personnel utilizing lockout on systems will follow Chapter G Lockout/Tagout. All authorized locking/tagging authorities of Burns & McDonnell and Subcontractors will be documented in BURNS & MCDONNELL Safety Form G-11 "Tagging Authority List".

G-11

(iv) Training Requirements

Burns & McDonnell shall conduct project orientations and the subcontractor is responsible for all required worker training. All project employees shall receive an orientation prior to starting to work on the project. Project orientations will be conducted by Burns & McDonnell or designee as needed by the project. This project orientation may not be restricted to the items listed on the BURNS & MCDONNELL Safety Form C-8 "Project Orientation" , but shall at a minimum, include all applicable items listed.

C-8

Subcontractor employees involved in the following areas shall be trained by the subcontractor. All training shall be documented on the Burns & McDonnell Safety Form C-9 "Certification of Training" and submitted to BURNS & MCDONNELL prior to the activity by the subcontractor for all of, <u>but not limited to</u>, the following:

(A) Fall Protection
(B) Scaffolds
(C) Hazardous Energy Control - Lockout/Tagout

(D) Confined Space
(E) Respiratory Protection
(F) Powered Industrial Truck Operators
(G) Crane Operators (Per Type of Equipment)
(H) High Voltage

C-9

Additional information regarding OSHA required training may be found in BURNS & MCDONNELL Safety and Health Form C-21 "OSHA required Training Requirements and Training Guidelines", or at http://www.osha.gov/Publications/2254.html

C-21

(v) Pre-Task Analysis (PTA)

A Pre-Task Analysis (PTA) shall be documented daily (specific to the task being performed) for all subcontractor employees BURNS & MCDONNELL Safety Form C-10 "Pre-Task Analysis (PTA)". A copy of all PTA reports must be submitted to Burns & McDonnell weekly.

C10

(vi) Work Area Safety & Health Inspections

Daily work area Safety & Health Inspections shall be conducted by the front line supervisor of each crew using the BURNS & MCDONNELL Safety Form C-11 "Work Area Inspection Checklist". The completed reports are to be submitted weekly to Burns & McDonnell. Included in the reports shall be deficiencies detected and corrective action taken.

C-11

(vii) Incident/Accident Review & Reporting

An executive management member, of the Subcontractor will arrive on site within 48 hours of an incident to attend an incident review meeting if an OSHA recordable accident occurs. If an OSHA DART, or a near miss incident that may have produced injury takes place or a property damaging incident occurs which results in a loss of $5,000 or more, the president of the company shall attend this meeting as well.

At the time of this meeting the executive management member and/or president of the company shall submit a plan of action to prevent such occurrences in the future.

In the event a death occurs on site or a single event hospitalizes three or more individuals, Burns & McDonnell shall immediately be notified. Failure to comply with this procedure will result in disciplinary action at the discretion of Burns & McDonnell.

(viii) Activity Hazard Analysis (AHA)

Major work operations, such as those with a hazardous nature or that require special planning shall use a BURNS & MCDONNELL Safety Form C-12 "Activity Hazard Analysis" completed prior to the work operation. At a minimum, the following details shall be included on the activity hazard analysis:

(A) Define Activity
(B) Describe Sequence of Operation
(C) Specific Hazards Related to Operation

(D) Hazard Control Measures
(E) Training for all Involved Employees
(F) Competent Person

C-12

For work associated with:
(A) Fall hazards, including fall hazards associated with scaffold erection and removal, identify the appropriate fall arrest systems.
(B) Materials handling equipment, address safeguarding measures related to materials handling equipment.
(C) Excavations including excavation safeguarding requirements.

The appropriate activity hazard analysis shall be reviewed and attendance documented by the Subcontractor at the preparatory, initial and follow-up phases of the operation.

Prior to the start of the work operation, the appropriate people shall be assembled by the Subcontractor to complete the activity hazard analysis. All employees involved in the operation shall be trained in all of the details described on the activity hazard analysis. The activity hazard analysis BURNS & MCDONNELL Safety Form C-12 "Activity Hazard Analysis" and verification of training BURNS & MCDONNELL Safety Form C-9 "Certification of Training" for all employees involved in the operation shall be submitted to Burns & McDonnell prior to commencing the work operation.

C-9 C-10 C-12

At a minimum, all of the following work operations and activities require an activity hazard analysis along with any other operations determined necessary by Burns & McDonnell:
(A) Building
(B) Mechanical Equipment Installation
(C) Pile Driving And Drill Pier Installation
(D) Structural Steel Erection
(E) Startup And Commissioning Activities
(F) Painting, Coating And Lining Operations
(G) Metal Wall Panel Installation
(H) Pre-Cast Concrete Panel Installation
(I) Chemical Cleaning Activities
(J) Concrete Work,
(K) Excavations & Trenching
(L) Confined Space Work
(M) Electrical Equipment Installation
(N) Foundation Work
(O) Hazardous Waste Remediation
(P) Heavy Rigging & Lifting Operations
(Q) Insulation Work
(R) Pressure Testing
(S) Roofing & Decking Work
(T) Tower Construction

c. Monthly Submittal Requirements
(i) Monthly Crane Inspection Reports

A monthly crane inspection shall be conducted by the designated competent person for cranes and shall be submitted to Burns & McDonnell by the first working day of each month.

The crane / lift type specific inspection form from the BURNS & MCDONNELL Safety Forms (refer to Chapter N or Chapter R) shall be used.

d. Weekly Submittal Requirements

(i) Weekly Toolbox Safety Meetings

All Subcontractors on site shall hold weekly toolbox Safety & Health meetings with their employees which shall be documented on the BURNS & MCDONNELL Safety Form C-13 "Weekly Safety Toolbox Meeting" and submitted to Burns & McDonnell within 24 hours of the meeting. Subcontractors shall inform their personnel of any coordination efforts discussed in the Project Safety & Health Coordination Meeting which will affect their work with regard to Safety & Health. In addition, these meetings shall be utilized to inform their personnel of a select topic to educate employees of hazards incurred on the project and in related activities.

C-13

e. One-time Submittals

(i) A list of competent persons per activity (as required by OSHA) shall be submitted prior to beginning work on any activity that requires a competent person use BURNS & MCDONNELL Safety Form C-17 "Competent Person Designation".

C-17

(ii) A complete chemical inventory for all hazardous chemicals kept on site shall be submitted via BURNS & MCDONNELL Safety Form Z-1 "Chemical Inventory List". This list shall be updated as necessary

(iii) MSDS for all chemicals in the chemical inventory list, but no chemical shall be brought on site prior to submittal of the MSDS for inclusion in the chemical inventory list.

Z-1

f. Other Submittals

(i) Other submittals will be required as needed. For help in meeting these requirements refer to the BURNS & MCDONNELL Safety Form C-20 "Safety Submittals".

C-20

Project Procedures

Subcontractors shall adhere to the following Project Procedures and Requirements:

1. "Substance and Alcohol Abuse Prevention Program".

   a. Pre-Site Access/Annual Testing
   b. Post Incident
   c. Reasonable Cause
   d. Random

2. Safety Incentive Programs

Incentive programs are one of the Five High-Impact Zero Injury Techniques as defined by the Construction Industry Institute. Establishment of these programs is considered of high importance for employee recognition and ownership of the Project Safety & Health Program. The Safety Incentive Program will be designed when the project begins and after a formal budget has been established. Subcontractor participation is encouraged to show a commitment of safety/health on all levels for the project

3. Task Safety Observations

The purpose of Task Safety Observation is to identify and correct project safety and health hazards and "at risk" behaviors encountered in the workplace, to provide uniform guidance, requirements to identify and correct these hazards and "at risk" behaviors, and satisfy OSHA standards.

Task Safety Observation Procedu

TSO Trifold .pub

4. Amendment Form

On special occasion(s), circumstances on site will necessitate a change in a safety procedure or procedures. In this event, the Project Manager shall be notified, as well as the Director of Corporate Safety & Health and the Global Practice Manager. The BURNS & MCDONNELL Safety Form C-14 "Program Amendment" shall be completely filled out and signed prior to implementing any new procedure.

C-14

5. Postings

Posting of all federally required notices which includes, but is not limited to the following, shall be posted upon arrival of Subcontractor on site:

a. Notice to Workers Concerning Unemployment Benefits,
b. Employee Polygraph Protection Act,
c. Equal Employment Opportunity,
d. Discrimination in Employment,
e. Family and Medical Leave Act of 1993,
f. Federal Minimum Wage,
g. OSHA – Job Safety & Health,
h. Emergency Procedures and Contacts
i. OSHA 300A Summary (February 1 – April 30).
j. The appropriate State postings:
    i. Worker's Compensation
    ii. Minimum Wage
    iii. Discrimination, etc.

6. Scaffold Tagging

All scaffolding shall be required to be tagged by the Subcontractor's designated competent person for scaffolds indicating its suitability for use. Burns & McDonnell shall be notified each time a scaffold is

tagged prior to employee use. Tags shall be affixed to the scaffold so they are easily noticeable at each access point. The color coding is as follows:

Table C- 1 Scaffold Tagging Color Codes

Scaffold Tag Color		Project Definition
Red		UNSAFE – Do Not Use
Yellow		Warning – Hazard Exists
Green		Ready to Use

The scaffold erector's competent person(s) shall make daily inspections of the scaffolding prior to its use. All findings shall be documented on the BURNS & MCDONNELL Safety Form C-11 "Work Area Inspection Report" by the Subcontractor.

C-11

Only the erector of the scaffold shall make modifications to the structure. Access ladders are required. Climbing up the side of scaffolding is not permitted unless the scaffold is designed for such use.

Subcontractors are responsible for obtaining all permits; licenses and having a registered engineer approve the scaffold when applicable.

7. Signage and Barricading Work

The Subcontractor shall barricade and mark (tag/sign) all hazardous areas. This shall include, but is not limited to open ditches, trenches, and other excavations; overhead work; and temporarily suspended loads.

Red barricades shall denote that enclosed area is off limits to any person(s) not performing work in the area.

Yellow barricades shall denote that a hazard exists and should be identified in the barricaded area prior to entering.

Other colors may be used as specified by CITY OF STILLWATER requirements as follows:

8. Evacuation/Emergency Procedures

Evacuation/Emergency Procedures shall be implemented for the following circumstances by the Subcontractor for their employees as applicable:

a. medical emergencies,
b. fire,
c. hazardous material spills and
d. varying weather circumstances.

Subcontractor shall have person(s) trained in providing First Aid and CPR or have a Designated Medical Facility within approximately fifteen (15) minutes of the job site.

The BURNS & MCDONNELL Safety Form E-1 "Emergency Action Plan" may be developed in the field in coordination with any existing **CITY OF STILLWATER** Emergency Action Plans / Emergency Response Plans.

E-1

9. Minimum Personal Protective Equipment

The following minimum personal protective equipment is required 100% of the time on the project:

a. Hard Hat (ANSI Z89.1-1986, Class E/G)
b. Leather work boots steel or composite toe with defined heel
c. Safety Glasses (ANSI Z87.1-1989)
d. Full length work pants, coveralls, jeans, etc.
e. Work shirt with a minimum 4" sleeve length
f. Hand protection appropriate for task and in accordance with Hand Protection Reference Guide

See Chapter I – Personal Protective Equipment for specific requirements of the PPE. Tank tops and halter tops are prohibited! Any articles of clothing or outerwear that display profane or offensive materials are prohibited. Subcontractors are responsible for supplying all personal protective equipment necessary for employees to safely perform duties required.

10. Housekeeping

Subcontractors are responsible for housekeeping of their work areas and cleaning of the debris and/or surplus materials accumulated as a result of the work process.

Subcontractors shall monitor craft activities to assure housekeeping cleanup is performed throughout the work process.

Accumulation of debris and waste materials slow the work process, create disorganization and contribute to unsafe work conditions. For this reason, all contracts have been structured to require Subcontractors to remedy such problems as assigned on the notification within the allotted abatement period. Failure to meet such conditions may result in charges to the Subcontractor for removal of trash or waste material by others from the work area or for clearing or moving tools, materials or equipment from aisles, walkways or work areas.

11. Fire Prevention Program

Each Subcontractor shall be responsible for fire protection throughout all phases of work as required by the National Fire Protection Code and the Chapter L of this program.

Only work procedures which minimize fire hazards to the extent practical shall be used. A fire extinguisher shall be present in the immediate vicinity of any hot work. Verification shall be made to assure no fire hazards exist for at least 30 minutes following the conclusion of the hot work activity. In addition the following outline summarizes when fire extinguishers are required:

Table C- 2 Fire Extinguisher Requirements			
Standard	**Location**	**Type**	**Distance**
150(c)(1)(i)	Building Area	2A	100 Foot Radius
150(c)(1)(iv)	Each Floor	2A	100 Foot Radius
150(c)(1)(iv)	Multi-Story Building	2A or Suitable for Hazard	Next to Stairway
150(c)(1)(vi)	5 Gal. of Flamm. or Comb. Liquids or 5 Gal. of Flammable Gas	10B	Within 50 Feet
150(c)(6)	Open Yard Storage	2A or Suitable for Hazard	100 Foot Radius
152(d)(1)	Flammable Liquid Storage Room	20B	10 Feet Outside
152(d)(2)	Outside Flammable Liquid Storage Area	20B	25-75 Feet
152(d)(4)	Vehicles Used for Dispensing or Transporting Flamm. or Comb. Liquids	20B:C	On Vehicle
152(g)(11)	Service or Fuel Area	20B:C	Within 75 Feet
153(l)	LP-Gas Storage Area	20B:C	In Location
352(d)	Welding, Cutting or Heating Areas	Suitable for Hazard	In Area
550(a)(14)(i)	Crane Cabs	5B:C	On Crane
Subcontractors shall provide, as a minimum, a 20-pound ABC fire extinguisher (charged and ready for use) at each hot work site for fire watch purposes.			

12. Site Sanitation/Waste Plan – All wastes shall be disposed of properly.

    a. CONTROLS AND DISPOSAL OF SOLID WASTE
    Solid waste will be picked up and placed in containers as generated. All waste containers shall be emptied by the contractor on a regular basis, as to prevent over-flowing conditions. All handling and disposal will be conducted in such a fashion as to minimize secondary contamination by overflow or spillage during waste transfer.

    b. DISPOSAL OF DEMOLITION AND OTHER CONSTRUCTION DEBRIS
    Disposition of construction debris shall be conducted as follows: All wastes generated by demolition activities shall be segregated as much as practicable, and placed in dumpster. Upon completion of all demolition activities, the area shall be clean, absent of signs of demolition, construction, temporary construction barriers or demolished structures. Exceptions to this requirement shall be specifically defined within the scope of work for this task order.

    c. SEWAGE:
    All sewage will be disposed of through connections to established sanitary systems. Where such systems are not available, chemical toilets or comparable effective units will be used with collected wastes periodically emptied by means of a sanitary pumping service. No conditions shall be allowed to exist where noticeable odors are present.

Table C- 3 Requirements For Toilets Facilities Ratio Of # workers to #of Toilets	
Number of Workers	**Number of Toilets**
10 or less	1 toilet seat and 1 urinal
20 or less	2 toilet seats and 2 urinals
More than 20	2 toilet seats and 2 urinals per additional 15 workers

Additionally, the above ratio of toilet facilities shall be used for female workers independent of male employees on site. Women's facilities shall be clearly indicated as such and be equipped with a lock. Use of these facilities by males shall be prohibited at any time.

d. DUST CONTROL:
Positive dust control shall be exercised at all times during this project. Dust generation during (saw-cutting or chipping) activities shall be minimized by a constant water stream wetting the concrete. All efforts to minimize dust generation with water spray shall be expended.

e. CHEMICALS AND CHEMICAL WASTE
In the event that a chemical is put into use in some form (after submittals and approvals are obtained if required), the following procedure shall be followed:
   i. All chemicals shall be dispensed ensuring no spillage to the ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action.
   ii. All activities and inspection shall be documented.
   iii. Chemical waste shall be collected in corrosive resistant containers.
   iv. All chemical containers shall be investigated to assure chemical compatibility with the medium to be collected.
   v. Collection drums shall be monitored and removed to a storage or staging area when contents are within 6-inches of the top.
   vi. Wastes shall be classified, managed, stored and disposed of in accordance with Federal, State, and local laws and regulations.

f. HAZARDOUS WASTE MANAGEMENT AND DISPOSAL
Hazardous waste generated during the course of this project will be appropriately classified by the responsible party (as determined by contract) and removed for appropriate disposal by a licensed disposal company.

g. FUELS AND LUBRICATION
Any fuels brought on-site by the contractor shall be in approved, self-closing, leak-proof, steel containers. These containers (if any) shall not be stored in a designated area and provide secondary containment as required.

h. WASTEWATER DISPOSAL
Wastewater generated during the course of these construction activities, such as spray-waters used during trenching, shall not be allowed to enter any waterways or to enter any storm drain system. Any generated wastewater shall be treated to remove any contaminants prior to discharge, or shall be captured, stored and removed from the facility as potentially contaminated wastewater. No wastewater shall be disposed of without compliance with all Federal, State, or local laws and regulations.

i. GARBAGE DISPOSAL –
The contractor will place all generated garbage in an appropriate container and arrange for disposal by means of contracted vendor, which can provide a timely pick-up.

13. Cell phones –

Personal cell phone use is prohibited on the project site, with exception given in designated break areas. Cell phones or any other non-intrinsically safe devices are prohibited in process areas.

14. Breaks and Lunches

a. Break areas –
All break areas shall be approved by Burns & McDonnell (or client as required). Break area shall be indicated by a clearly defined border on at least 3 sides. Food and drink other than water shall be confined to designated break areas. There shall be no storage of materials in break areas.

b. Smoking areas –
Smoking shall be confined to designated smoking areas only. Smoking areas shall have a dedicated fire extinguisher and appropriate receptacles for disposal of cigarettes (butt cans, etc.). There shall be no disposal of other trash in these receptacles.

c. Drinking Water –
An adequate supply of fresh, potable drinking water should be provided in an easily accessible location. Portable water containers used to dispense drinking water shall be cleaned daily, must be capable of being tightly closed, and shall equipped with a tap. Any container used to distribute drinking water should be clearly marked with the nature of its contents and not used for any other purpose. Containers shall be sealed (duct taped) and dated for fill date.
Where paper cups are supplied, a disposal receptacle should be provided immediately nearby.
The use of pails and dippers or a common drinking cup for dispensing drinking water is prohibited.
If for any reason water that is unfit for human consumption is used at the job site, it must be identified and labeled to clearly indicate that the water is unsafe for drinking, washing or cooking.

15. Washing and Hygiene Facilities –

Adequate washing facilities for employee-owners shall be provided where hazardous substances may be handled or come into contact with the skin. Such facilities or means, e.g. disposable wet wipes for hand/face washing shall be in near proximity to the worksite.

16. Machinery, Tools, Material, Or Equipment –

The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this part is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

17. Visitor Access

Visitors/vendors to the site must sign in using the Burns & McDonnell Safety Form C-16 “Visitor Sign-in”.

If an emergency should arise the designated person shall take the Visitor Sign-in to the designated assembly area.

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Substance and Alcohol Abuse Program

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Substance and Alcohol Abuse Prevention Program

Purpose

1. Burns & McDonnell has the right and obligation to maintain a safe, healthy, and efficient working environment. Being under the influence of a drug or alcohol on the job poses serious safety and health risks to the user and to all those who work with the user.

    a. The use, sale, purchase, transfer, or possession of an illegal drug in the workplace, and the use, possession, or being under the influence of alcohol also poses unacceptable risks for safe, healthy, and efficient operations.

    b. The unlawful manufacture, distribution, consumption, possession, or use of a controlled substance and alcohol is prohibited at the worksites under the scope of work for the Project.

2. The Subcontractor shall comply with these requirements for a Drug and Alcohol Free Workplace, unless a more stringent program is defined for the Project. By signing a contract agreement with Burns & McDonnell or owner, the Subcontractor certifies that their employees will comply with this written substance abuse testing program.

    a. The Subcontractor shall assist Burns & McDonnell in administering the Project requirements for a substance abuse detection and prevention program as part of its responsibilities and scope of work.

    b. All costs for substance abuse/alcohol testing shall be included in the Subcontractor's contract price.

    c. Personnel entering, working on, or leaving the Project worksite shall be subject to search in support of the substance and alcohol abuse prevention program.

    d. Supplier representatives, home office employees, and field technical representatives who visit the Project worksite on a short-term basis (three-calendar-day period) are not subject to drug and alcohol testing, although such persons are subject to search and/or inspection procedures in support of the substance and alcohol abuse prevention program.

Testing

1. Burns & McDonnell employee owners and Subcontractor workers working on Project worksites, including workers, new hires, replacements, and supervisory personnel, are subject to the following Drug and Alcohol testing:
    a. Pre-Site Access/Annual testing,
    b. Post-Accident/Incident testing,
    c. Probable Cause/Reasonable Suspicion and
    d. Random testing as a condition of contract.
    e. Subcontractors are required to send evidence that a worker's drug and/or alcohol test was negative, regardless of the reason for testing, to Burns & McDonnell within three days of completion of the test utilizing Burns & McDonnell Safety Form C-18 "Substance Abuse Site Access Verification".

C-18

2. The following is a listing of the types of testing, and required time frames for such testing, as required under this program.
   a. Pre-Site Access/Annual Testing
      i. Initial site access of any worker shall be conditional upon successfully meeting the requirements of the pre-site access substance and alcohol test.
      ii. The pre-site access test must be taken by the worker within 5 days prior to reporting to the Project site.
      iii. Only workers who are certified as drug- and alcohol-free, in accordance with the requirements of this program, shall be permitted by the Subcontractor to work at the Project worksites.
      iv. In addition, each worker shall participate in annual testing.
         (A) The pre-site access test date will become their new annual testing date for the substance and alcohol abuse prevention program.
      v. This program prohibits the Subcontractor from giving any more than 7 days' notice to a worker of pre-site access/annual testing.
   b. Post-Accident/Incident Testing
      i. A drug and alcohol test of a subcontractor worker is required when they are involved in a near-miss/incident or event, caused by them either directly or indirectly, that results in any injury to the worker or any other individual on the Project site or results in damage to property.
      ii. The test is to be administered either at the time of the first physician visit, or on the day of the incident/property damage.
   c. Probable Cause/Reasonable Suspicion Testing
      i. A drug and alcohol test shall be required at the time of observable probable cause circumstances, based on objective evidence about the worker's conduct in the workplace, that would cause a reasonable person to believe that the worker is demonstrating signs of impairment due to alcohol or other drugs, or is in possession of alcohol, drugs, or other controlled substances.
      ii. Such observation must be documented using Burns & McDonnell Safety Form C-19 "Substance Abuse Reasonable Cause Documentation", and the supervisor shall provide Burns & McDonnell with a copy.

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      iii. A copy of the C-19 Form shall be provided to the employee upon request.
   d. Random Testing
      i. Subcontractor is required to perform random testing on their workers working on the Project worksite.
      ii. The testing is to be unannounced and unscheduled, and upon notification the worker must immediately report to the testing facility.
         (A) Random testing shall be conducted at least once each month. The date of such testing shall be selected using a method of selection that randomly selects the date within the time frame specified, so that the date is unpredictable to the potential subjects of the testing.
         (B) Supervisors on the Project will not be informed of the names of selected workers or the date of testing until two hours prior to the actual screening process.
      iii. Random selection includes all workers on the jobsite the day selected for random testing.
         (A) Workers to be tested shall be chosen using a method of selection that:
            (1) is truly random without discrimination or arbitrary selection,
            (2) randomly selects 10 percent of subjects from among the pool of each subcontractor and their lower-tiered subcontractor workers on the project worksite,
            (3) ensures that every worker has an equal chance to be selected for testing each time a selection takes place each month, and
            (4) can be verified and documented.

Collections

1. A pre-screening (e.g. Insta-Check) program may be used along with a urinalysis test only if approved by Burns & McDonnell.
   a. If for any reason the pre-screening is inconclusive the specimen shall be sent to the appropriate facility for testing.
   b. Access to the site shall be prohibited until confirmation of a negative test has been received by Burns & McDonnell.

2. Specimen collection and pre-screenings will be conducted in accordance with the Department of Health and Human Services (DHHS), Substance Abuse and Mental Health Services Administration (SAMHSA), "Mandatory Guidelines for Federal Workplace Drug Testing Programs".
   a. Specimen collection(s) can be conducted at the project worksite or a local clinic approved by Burns & McDonnell.
   b. All substance analysis in specimens shall only be performed by SAMHSA laboratories certified by DHHS, as outlined in the federal guidelines.
   c. In addition, specimen collection shall be conducted in accordance with state and federal law.
      i. The procedure shall be designed to ensure the security and integrity of the specimen provided by each worker by following accepted chain-of-custody guidelines.
      ii. Every reasonable effort will be made to maintain the dignity of anyone submitting a specimen for this program.

3. The only methodology for substance abuse testing approved by DHHS is urinalysis.
   a. Urinalysis involves screening for the presence of drug metabolites in a two-step process.
      i. The initial test is an immunoassay, a screening test based on antibodies directed against each major drug class.
         (A) Specimens containing the drug at less than the initial test cutoff concentration are reported as "Negative".
         (B) Specimens that are not negative at the initial test are taken to a second, confirmation test using gas chromatography-mass spectrometry (GC/MS).
            (1) GC/MS is a quantitative test that unequivocally determines presence or absence of the drug.
         (C) If a drug is determined to be present at greater than or equal to the confirmation cutoff concentration, it is reported as "Positive".
            (1) No adverse personnel action should ever be taken before completing the two-step procedure.
      ii. Refusal to test, or failure to remain and complete the testing procedure, shall carry the same sanctions as a positive test result.

4. Personnel selected for a drug/alcohol test are required to remain under the supervision of their supervisor, collection site personnel, or representative from their company or Burns & McDonnell from the time of test notification until released.
   a. If personnel are unable to supply a sample at the time of testing, they shall be required to wait up to two hours, without leaving the testing facility.
   b. Failure to remain and complete the testing procedure shall be considered a refusal to test, which carries the same sanctions as a positive test.
   c. To accommodate this probability, notification of random testing shall be given in ample time before the end of a shift.

Testing Parameters

1. The substance abuse testing parameters will consist of a 10-panel drug screen using the substances and the cut-off levels listed in TABLE 1 "Cut-Off Levels for Substance Abuse Testing". The cut-off levels are equivalent or more stringent than the DHHS Guidelines for Federal and Department of Transportation (DOT) workplaces listed in the DHHS – SAMHSA guidelines, as well as in 49 CFR Part 40.87 for the DOT.
   a. In addition to these substances and cut-off levels, the creatinine level and specific gravity of the specimen shall be measured.
      i. If the creatinine level is less than 20 milliliter per deciliter and the specific gravity is less than 1.003, the sample shall be considered dilute and another collection will be required.
      ii. The second sample shall be requested to be collected the following morning from the time of notification of a diluted sample.
   b. Those samples containing adulterants or considered substituted as determined by the laboratory will be considered as a positive test.
   c. New drugs and preliminary cutoff and confirmation levels may be added and modified periodically in order to parallel the DHHS – SAMHSA and DOT guideline requirements.
   d. More stringent limits of sensitivity and specificity for each drug of abuse may be defined by the Project owner and shall be followed.

2. The alcohol abuse testing parameters will consist of an alcohol test using the breath or blood to determine blood alcohol content (BAC). If possible, a breathalyzer-type instrument conforming to the DOT guidelines should be used. If that is not available, then a blood draw may be used.
   a. Breath and/or blood collection shall be conducted at the project worksite clinic or a local clinic approved by Burns & McDonnell.
   b. Failure to provide a sufficient breath sample to complete a breath test or refusing to provide a blood sample will be considered a refusal to test and have the same consequences as a positive test.
   c. The minimum requirement for a positive test result for alcohol will be a BAC of 0.02 % or 0.02 grams of alcohol per 100 milliliters of blood.
   d. Any initial breath test that indicates a BAC of 0.02% or greater will be confirmed by an Evidential Breath Testing device operated by a Breath Alcohol Technician.
      i. The confirmation test will be performed no sooner than 15 minutes and no later than 30 minutes following the completion of the initial test.
   e. Two blood samples will be drawn if the blood is used to determine BAC.
   f. An alcohol concentration of 0.02% or greater from the confirmation breath test or concentration of 0.02 grams of alcohol per 100 milliliters of blood or greater from the blood samples will be considered a positive alcohol test.

3. All drug testing shall come under the control and supervision of a physician with confidentiality protected in accordance with state law and the "American Medical Association's Code of Ethical Conduct for Physicians Providing Occupational Medical Services" or the Medical Review Officer Manual, as developed by the National Institute on Drug Abuse (NIDA).
   a. The laboratory or testing facility shall report all results to the Medical Review Officer (MRO) for verification and medical review.
      i. The MRO shall be a licensed physician responsible for receiving laboratory results generated by a substance abuse testing program, who has knowledge of substance abuse disorders, and who has received appropriate medical training to interpret and evaluate an individual's medical history, and any other relevant biomedical information, as certified by either the American Medical Association or the American College of Occupational and Environmental Medicine.

Sanctions/Consequences Imposed for Failing Drug and/or Alcohol Test

1. Immediate removal from the project site shall occur when:

a. Any worker is found to possess, distribute, sell, attempt to sell, or transfer of an illegal drug while on project worksites or while performing project business;
b. Any worker is found to be in possession of or under the influence of alcohol while on project worksites or while performing project business;
c. Any worker is found to be in possession of contraband or other controlled substances;
d. Any worker who is found through drug and alcohol testing to have in their body a concentration of a substance abuse drug or of alcohol that is equal to or exceeds the confirmatory test cutoff limits; or
e. Any worker who refuses to cooperate in providing a specimen or participating in the testing.

2. Anyone failing to comply with this program shall be permanently prohibited project worksite access.

Training

1. All workers shall be educated in all provisions of this program through classes and/or other methods as appropriate.

2. All supervisory personnel (site superintendents, site supervisors, foremen) should receive additional training relative to the detection of signs and symptoms of drug and alcohol use.

Table C- 4 Cut-Off Levels for Substance Abuse Testing

Drug Class	Drugs Confirmed	Cut-Off Level (ng/mL) Initial Test (Immunoassay)	Cut-Off Level (ng/mL) Confirmation Test (GC-MS)
Amphetamines	Amphetamine Methamphetamine	1,000	500
Barbiturates	Amobarbital Butalbital Pentobarbital Phenobarbital Secobarbital	300	300
Benzodiazepines	Most benzodiazepines used in U.S., and metabolites	300	300, except alpha-hydroxyalprazolam
Cannabinoids	Carboxy-THC (THCA)	50	15
Cocaine metabolite	Benzoylecgonine	300	150
Methadone	EDDP (Methadone metabolite)	300	150
Methaqualone	Methaqualone	300	150
Opiates	Morphine Codeine Hydromorphone Hydrocodone	300	300
Phencyclidine, (PCP)	Phencyclidine	25	25
Propoxyphene	Norpropoxyphene	300	300

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  - Horse Scaffolds
  - Form Scaffolds and Carpenters Bracket Scaffolds
  - Roof Bracket Scaffolds
  - Outrigger Scaffolds
  - Pump Jack Scaffolds
  - Ladder Jack Scaffolds
  - Window Jack Scaffolds
  - Crawling Boards (Chicken Ladders)
  - Step, Platform, and Trestle Ladder Scaffolds
  - Single-Point Adjustable Suspension Scaffolds
  - Two-Point Adjustable Suspension Scaffolds (Swing Stages)
  - Multi-Point Adjustable Suspension Scaffolds
  - Catenary Scaffolds
  - Float (Ship) Scaffolds
  - Interior Hung Scaffolds

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Protection for Floor Openings

1. When floor grating must be removed, Burns & McDonnell "Floor Grating and Handrail Removal Permit" Safety Form D-1 shall first be obtained. This form must be posted at the worksite until the grate is back in place and secure.

   D-1

2. Hole Covers shall be secured in place and shall be clearly marked as holes by affixing Burns & McDonnell Safety Form D-6 "Hole Cover" Safety Label.

   D-6

Protection of Open-Sided Floors, Platforms, and Runways

1. Burns & McDonnell "Perimeter Guardrail Inspection" Safety Form D-2 shall be submitted whenever a guardrail is erected.

   D-2

2. Whenever a guardrail must be removed Burns & McDonnell "Floor Grating and Guardrail Removal Permit" Safety Form D-1 shall first be obtained.

   D-1

3. Upon completion of their work Subcontractors must either: remove their guardrail system, accept continued responsibility for it, or shall submit Burns & McDonnell "Perimeter Guardrail Inspection" Safety Form D-2 with the next controlling contractor.

   D-2

Ladders

Care and Use

Ladders shall be inspected monthly and those with defects shall be withdrawn from service for destruction and tagged or marked as Dangerous, Do Not Use. Inspections shall be documented using Burns & McDonnell "Ladder Inspection" Safety Form D-4.

D-4

Wooden or metal ladders shall not be used on Burns & McDonnell projects, except job made wooden ladders shall be permitted provided Burns & McDonnell "Job Made Ladder Checklist" Safety Form D-5 is submitted.

D-5

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- Exit route must meet minimum height and width requirements
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- Minimum elements of a fire prevention plan
- Worker information

Emergency Action Plans

Written emergency action plans

Burns & McDonnell Health & Safety Form E-1 "EAP and Fire Prevention Plan", or equivalent, must be completed, kept in the workplace, and available to workers for review.

E-1

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Powered Platforms/Aerial Lifts

General requirements

Aerial lifts may not be field modified for uses other than those intended by the manufacturer, unless the modification has been certified in writing by the manufacturer to be at least as safe as the equipment was before modification.

Specific requirements

1. Lifts shall be tested each day prior to use. Burns & McDonnell Aerial Lift Inspection Safety Form F-1, or equivalent, shall document these inspections.

   F-1

2. A ground-man (spotter) trained in the operation of the aerial lift shall remain with the aerial lift when in use at all times.

3. A given spotter may serve as ground-man for more than one aerial lift only when they are able to view the lifts in the same line of sight and remain capable of; spotting for the lifts, and advise any parties in the vicinity of the overhead hazard.

4. A ground-man shall wear a high visibility vest while performing their duties.

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Confined Space

General requirements

All confined spaces shall be considered permit requiring unless they have been declassified using Burns & McDonnell "Work Permit" Safety Form C-7. Permit required confined space entry shall not be permitted prior to completion of Burns & McDonnell "Work Permit" Safety Form

C-7

Permit-required confined space program (permit space program).

Atmospheric Testing

All permit required confined spaces shall be monitored for atmospheric conditions/contaminants prior to entering the space. Portable gas monitors shall be bump tested prior to use. The record of testing shall be documented using the Burns & McDonnell "Portable Gas Monitor Bump Test Log" Safety Form G-8.

G-8

Permit system.

All canceled or completed confined space entry permits shall be submitted to Burns & McDonnell.

Entry permit

Permit required confined space entry shall not be permitted prior to completion of Burns & McDonnell "Work Permit" Safety Form C-7.

C-7

Sewer System Entry

Sewer entry differs in three vital respects from other confined space permit entries; first, there rarely exists any way to completely isolate the space to be entered; second, because isolation is not complete, the atmosphere may suddenly and unpredictably become lethally hazardous (toxic, flammable or explosive) from causes beyond the control of the entrant, and third, experienced sewer workers are especially knowledgeable in entry and work in their permit spaces because of their frequent entries. Unlike other employments where permit space entry is a rare and exceptional event, sewer workers' usual work environment is a permit space.

1. Adherence to procedure. Only workers trained in sewer entry are allowed in sewer systems.

2. Atmospheric monitoring. Entrants will be trained in the use of, atmospheric monitoring equipment which sounds an audible alarm, in addition to its visual readout. Atmospheric monitors will be available for entrants

3. Surge flow and flooding. Sewer crews shall communicate with the local weather bureau and fire and emergency services in their area so that sewer work may be delayed or interrupted and entrants withdrawn whenever sewer lines might be suddenly flooded by rain or fire suppression activities, or whenever flammable or other hazardous materials are released into sewers during emergencies by industrial or transportation accidents.

4. Special Equipment. Entry into large bore sewers may require the use of special equipment. Such equipment might include such items as atmosphere monitoring devices with automatic audible alarms, escape self-contained breathing apparatus (ESCBA) with at least 10 minute air supply (or other NIOSH approved self-rescuer), and waterproof flashlights, and may also include boats and rafts, radios and rope stand-offs for pulling around bends and corners as needed.

Confined Space Entry Program for Sewer Entry

Scope and Application

The sections that follow apply only to permit-required confined space entry. The information on alternate entry has been identified with a title.

1. **Potential Hazards**
   Check the boxes after you have reviewed your worksite for these hazards.
   Workers could be exposed to the following:

   a. Engulfment and drowning
   b. Presence of toxic gases that are equal to or more than 10 ppm hydrogen sulfide; measured as an eight-hour time-weighted average; or if the presence of other toxic contaminants is suspected, specific monitoring shall be implemented.
   c. Presence of explosive/flammable gases that are equal to or greater than ten percent of the lower flammable limit (LFL)
   d. Oxygen deficiency/enrichment where the oxygen concentration in the atmosphere which is equal to or less than 19.5% by volume is considered a deficiency, while an oxygen concentration which is greater than 23.5% by volume is enrichment.

2. **Entry Permits**

   a. All sewers are considered permit-required confined spaces until the pre- entry procedures demonstrate otherwise by completion of Burns & McDonnell "Work Permit" Safety Form C-7.
   C-7

   b. Any worker required or permitted to pre-check or enter a sewer shall have successfully completed, at a minimum, the training outlined in our training procedures.
   c. A written copy of operating and rescue procedures as required by these procedures is at the worksite for the duration of the job.
   d. The sewer entry permit is completed before approval can be given to enter a sewer.
   e. The permit verifies completion of items required to protect workers.
   f. The permit is kept at the job site for the duration of the job.
   g. If circumstances cause an interruption in the work or a change in the alarm conditions for which entry was approved, a new sewer entry permit needs to be completed.

3. **Control of Atmospheric and Engulfment Hazards**

a. Surveillance
   i. The surrounding area is surveyed to avoid hazards such as drifting vapors from tanks, piping, or sewers.
b. Testing
   i. The sewer atmosphere shall be tested to determine whether dangerous air contamination or oxygen deficiency exists.
   ii. A direct reading gas monitor is used. Portable gas monitors shall be bump tested prior to use. Record of testing shall be documented using Burns & McDonnell Portable gas Monitor Bump Test Log Safety Form G-8.

G-8

   iii. Testing is performed by a supervisor who has successfully completed the gas detector training for the monitoring method used.
   iv. The minimum parameters to be monitored are oxygen deficiency, Lower Flammable Level (LFL), and hydrogen sulfide concentration.
   v. A written record of the pre-entry test results is made and kept at the worksite for the duration of the job.
   vi. Affected workers are able to review the testing results.
   vii. The most hazardous conditions will determine when work is being performed in two adjoining, connected spaces.
c. Space ventilation
   i. Mechanical ventilation systems, where required, are set at one hundred percent of the outside air.
   ii. Where possible, open additional manholes to increase air circulation.
   iii. Use portable blowers to increase natural circulation if needed.
   iv. After a suitable ventilation period, repeat the testing.
   v. Entry may not begin until testing has demonstrated that the hazardous atmosphere has been eliminated or controlled.

4. **Entry Procedures**

Table G- 1 Entry Procedures for Confined Space Conditions

If you have any of the following conditions	Then follow these procedures
• Testing demonstrates the existence of dangerous or deficient conditions and additional ventilation cannot reduce concentrations to safe levels • The atmosphere tests as safe but unsafe conditions can reasonably be expected to develop • It is not feasible to provide for immediate exit from spaces equipped with automatic fire suppression systems and it is not practical or safe to deactivate such systems • An emergency exists and it is not feasible to wait for pre-entry procedures to take effect	• All workers are trained • A self-contained breathing apparatus is worn by any person entering the sewer. • At least one worker stands by the outside of the sewer ready to give assistance in case of emergency. • The rescue workers have a self-contained breathing apparatus available for immediate use. • There is at least one additional worker within sight or call of the standby worker. • Continuous powered communications is maintained between the worker within the sewer and standby personnel.

5. **Alternate Entry**

a. Certification
   i. Sewers may be entered without the need for a written permit or attendant if the space can be maintained in a safe condition for entry by mechanical ventilation alone.
   ii. All sewers are considered permit-required confined spaces until the pre-entry procedures demonstrate otherwise.
   iii. Any worker required or permitted to pre-check or enter a sewer will have successfully completed, at a minimum, the training outlined in our training procedures.
   iv. A written copy of operating and rescue procedures shall be at the worksite for the duration of the job.
   v. The sewer pre-entry checklist Burns & McDonnell Confined Space Entry Permit Safety Form G-7 shall be completed before entry into a sewer.
   vi. If circumstances dictate an interruption in the work, the sewer shall be reevaluated and a new checklist shall be completed.

b. Control of atmospheric and engulfment hazards
   i. Pumps and lines:
      (A) All pumps and lines which may reasonably cause contaminants to flow into the sewer are disconnected, blinded, and locked out, or effectively isolated by other means to prevent development of dangerous air contamination or engulfment.
      (B) Not all lateral lines to sewers or storm drains require blocking. However, where experience or knowledge of use indicates a reasonable potential for contamination of air or engulfment into an occupied sewer, then all affected lateral lines are to be blocked.
      (C) If blocking or isolation requires entry into the sewer, the provisions for entry into a permit-required confined space are implemented.
   ii. Surveillance:
      (A) The surrounding area is surveyed to avoid hazards such as drifting vapors from tanks, piping, or sewers.
   iii. Testing:
      (A) The atmosphere within the sewer will be tested to determine whether dangerous air contamination or oxygen deficiency exists.
      (B) Detector tubes, alarm only gas monitors, and explosion meters are examples of monitoring equipment that may be used to test sewer atmospheres.
      (C) Testing is performed by the entry supervisor who has successfully completed the gas detector training for the monitoring method to be used.
      (D) The minimum parameters to be monitored are oxygen deficiency, LFL, and hydrogen sulfide concentration.
      (E) A written record of the pre-entry test results are made and kept at the worksite for the duration of the job.
      (F) The supervisor will certify in writing, based upon the results of the pre-entry testing, that all hazards have been eliminated or controlled.
      (G) Affected workers shall be able to review the testing results.
      (H) The most hazardous conditions will determine when work is being performed in two adjoining, connecting spaces.
   iv. Entry procedures
      When entering without permit or an attendant, entry into and work within may proceed if:
      (A) There are no non-atmospheric hazards present
      (B) The pre-entry tests show there is no dangerous air contamination or oxygen deficiency within the space; and there is no reason to believe that any is likely to develop
      (C) Continuous testing of the atmosphere in the immediate vicinity of the workers within the space is accomplished

(D) Workers will immediately leave the sewer when any of the gas monitor alarm set points are reached as defined
(E) Workers will not return to the area until a supervisor who has completed the gas detector training has used a direct reading gas detector to evaluate the situation and has determined that it is safe to enter.
(F) If you are entering a space without a permit or an attendant
  (1) Arrangements for rescue services are not required for entries that do not require a permit.
  (2) See the rescue section for instructions regarding rescue planning where an entry permit is required.

6. **RESCUE**

a. Call the local rescue service
Phone #911 **Stillwater Public Safety Department**
b. Rescue entries into sewers are made only by trained and properly equipped personnel.
c. If immediate hazards to injured personnel are present, workers at the site implement emergency procedures without entering the sewer.
d. Continuous gas monitoring performed during all sewer entry operations. If alarm conditions occur, entry personnel exit the sewer and permit is no longer valid.
e. When dangerous air contamination is attributable to flammable or explosive substances, lighting and electrical equipment needs to be Class 1, Division 1 rated per National Electrical Code (NEC) and no ignition sources may be introduced into the area.
f. When it is practical, the full-body harness is used to suspend a person upright and a hoisting device or similar apparatus is available for lifting workers out of the sewer.
g. If at any time the use of a hoisting device or full-body harness and attached lifeline may endanger the worker, their use may be discontinued.

Review and follow the requirements for any of the situations in Table G-2, Procedures for Removing Workers from Sewers.

Table G- 2 Procedures for Safely Removing Workers from Sewers

If	Then
There is any questionable action or non-movement by the worker inside	− Perform a verbal check. − Immediately remove the worker from the sewer if there is no response or a questionable response from them
The worker is disabled due to falling or impact	− Do not remove the worker from the sewer unless there is immediate danger to the worker's life. − Notify local rescue personnel immediately. − Make sure the standby worker doesn't enter the sewer in this case. − Only trained rescue personnel (wearing self-contained breathing apparatus-SCBA) may enter to perform a rescue. − Make sure all workers entering the space use a full-body harness with attached lifeline with the free end of the line secured outside the entry opening. − Make sure the standby worker uses the lifeline to attempt to rescue a disabled worker without entering the space and summons rescue services based on their assessment of the situation.

Hazardous Energy Control Program (Lockout/Tagout)

Purpose

The purpose of this procedure is to establish the method in which lockout / tagout and permit to work functions will be administered. The intent of implementing these programs is to avoid any hazardous release of energy that could threaten the health and safety of project personnel or damage equipment. Energy in this context includes, but is not limited to, electrical, thermal, hydraulic, pneumatic, chemical, and potential energy such as from elevated weights and compressed springs.

BMcD Lockout / Tagout (LOTO) is required whenever construction, modification, testing, startup (commissioning), servicing, or maintenance is being performed on equipment or systems in which the unexpected energization, startup, or release of stored energy, could cause injury to people or damage equipment during the construction and startup stages of the project**.** Client LOTO Program shall be in effect at the time of startup completion of the system for permanent operation.

Definitions

LOTO Manager: The LOTO Manager is the person that manages the overall LOTO program for construction and startup of the project. The LOTO Manager or his designee is the person who approves PTWs, DNO Isolations, the hanging of SUT and SUO tags for the project, and has been trained in the applicable OSHA standards. **The LOTO responsibilities transfer to Client at the time of System Acceptance Certificate submittal to Burns & McDonnell.**

Tagging Authority: The Tagging Authority is a supervisor-level worker who has been assigned LOTO responsibility for a company and has been trained in the implementation of the project Lockout / Tagout and PTW program. The Tagging Authority is the person who submits PTWs, DNO Isolations for his/her area of responsibility to the LOTO Manager for implementation, and has been trained in the applicable OSHA standards.

Authorized Worker: Person, usually supervisor level or above, whom is authorized to request LOTO tagging and implement isolation if so directed by the applicable Tagging Authority. This person must be trained and must demonstrate understanding and competence in execution of the Lockout / Tagout and Permit to Work (PTW) Programs.

Affected Worker: The person whose job requires him/her to operate or use a machine or piece of equipment on which construction, modification, testing, startup, servicing or maintenance is being performed under a Lockout / Tagout, or whose job requires him/her to work in an area in which such activities are being performed is the affected worker.

Other Worker: Any person whose work operations may be in an area where energy control procedures may be used.

Burns & McDonnell "Danger – Do Not Operate" (DNO) Tags (white w/red and black lettering): Tag used to identify an isolation point and control the position or status of any device (valve, breaker, etc.) required to ensure a safe lockout. These tags will have a unique number and will be accompanied by an appropriate locking device (Burns & McDonnell "Do Not Operate Tag" Safety Form G-14).

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Burns & McDonnell "Caution – System Under Test" (SUT) Tags (yellow w/black lettering): Tag used to identify major equipment or systems under the control of Startup which may be operated or energized as necessary for the testing of the system or components. Each tag must have the appropriate Tagging Authority's name written on it (Burns & McDonnell "Caution System Under Test Tag" Safety Form G-15). Only the person whose name is on the tag and those working under his/her direction may operate the system or device.

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Client "Caution – System Under Operations" (SUO) Tags (orange w/black lettering): Tag used to identify major equipment and systems under the control of Operations which may be operated or energized as necessary to support the project operational requirements (Burns & McDonnell "Caution System Under Operations Tag" Safety Form G-16).

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Electrical LOTO Log: Log sheet specific to each electrical isolating device, which is used to track LOTO status on that device. Authorized Workers are required to sign on and off as DNO tags are hung and removed (Burns & McDonnell "LOTO Log" Safety Form G-10).

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Energy Isolating Device: An energy isolating device is a mechanical device that physically prevents the transmission or release of energy. Typical energy isolating devices are as follows.

1. A manually operated circuit breaker.
2. A disconnect switch.
3. A manual isolating valve.
4. A blank flange, slip blind, or any similar device used to physically block or isolate energy.

Push buttons, selector switches, and other control circuit type devices are not acceptable energy isolating devices.

Isolation Record (IR): A form used to initiate or request energy isolation and to track the placement and removal of that isolation. All isolations requiring more than one Lockout / Tagout, or single mechanical isolations, must be documented on an Isolation Record. Single electrical isolations can be controlled from the Electrical LOTO Log. Isolation Records have a unique number assigned for tracking purposes (Burns & McDonnell "Isolation Record" Safety Form G-13).

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Holder: Any Affected or Authorized worker who is signed onto the Isolation Record or the Electrical LOTO Log as a holder. By signing on as a Holder personnel ensure the LOTO is maintained until they have signed off. LOTOs cannot be removed without first clearing all holders off the respective forms. All LOTOs must have at least one Holder.

Lockout Device: A device that uses positive means, such as a lock, to hold an energy isolating device in the safe position and thus prevent the inadvertent energization of a machine or equipment or prevent the transmission or release of hazardous energy. Typical lockout devices and their acceptable use are as follows.

1. Padlocks/Tie wraps: Padlocks in conjunction with chains or specialized locking devices, or heavy duty tie wraps are used for mechanical and / or electrical lockouts when it is necessary to prevent the physical operation of a device (such as a valve or breaker).
   a. Each lock or tie wrap must be accompanied by a DNO tag for identification purposes.

2. Multi-lock Device(s): A device that accommodates more than one lock or tag.
   a. This allows personnel such as craft foremen or subcontractors to attach their own lock for additional protection during the performance of their work. Individual crew members have the right to affix their own locks if desired.

3. Electrical Distribution Panel Breaker Locking Devices: Panel breakers can be locked out by utilizing one of the following methods:
   a. Panel board locking device affixed over the breaker, accompanied by a DNO Tag (first preference).
   b. Any other means of hazardous energy control that equals the protection provided by locks and tags.

4. Physical Separation: Mechanical blind or method of physically separating or cordoning off a component or system. These devices must have a DNO attached.

Group Lock Box: A box utilized to organize keys for the isolation of equipment that has multiple locks to be attached, and cannot be completed with the multi-lock device. The Tagging Authority for the LOTO will sign on the LOTO for the lock box.

Permit to Work (PTW): A work authorization required to perform work on equipment, areas, systems, or sub-systems that have been turned over to Startup or Operations. See section 3.1 for detailed information on when a PTW work authorization is required. The PTW form is preprinted in triplicate with a unique sequential number assigned (Burns & McDonnell Safety Form C-7 "Work Permit").

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Safety Tagging Displays: Displays located throughout the plant, which communicate the tags and locking devices authorized for use on the project.

Tagging Authority List: Posted in a conspicuous location to identify each company's Authorized Tagging Authority (Burns & McDonnell "Tagging Authority List" Safety Form G-11)

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Procedure

Lockout / Tagout Sequence and Responsibilities - Sequence steps and personnel responsibilities for the lockout / tagout program vary with the three main stages of the project: Construction, Startup, and Operations.

Table G- 3 LOTO: Outline of Roles & Responsibilities in Each Stage			
Stage	**Tagging Authority**	**Authorized Worker**	**Notes**
Construction	Contractor assigned manager level personnel	Disc. Superintendent General Foremen Disc. Foremen	- Construction is in control of equipment and systems. - DNOs are used for LOTO.
Startup	Startup Manager Startup Engineers (by assigned system)	Startup Engineer Startup Technician	- Startup has accepted items on a system basis. - SUTs indicate items are in startup phase. - DNOs are used for LOTO.
Operations	Operations Manager Operation Supervisors	Operations Supervisors Operators	- Operations have accepted control of the system. - Client SUO tags indicate items are in operation. - Client DNOs are used for LOTO.

1. LOTO rules, which apply in all cases and to all stages of the project are defined below:

   a. Procedural
      i. Training must be conducted to ensure that all personnel are knowledgeable of their duties with regard to Lockout / Tagout and hazardous energy control (i.e. training must be commensurate with their level of responsibility and involvement – Other, Affected, Authorized, and Tagging Authority).
      ii. Only one type of tag (DNO, SUT, or SUO) can be on the same device at the same time.
      iii. All electrical isolations are tracked on an Electrical Isolation Log specific to that piece of equipment.
      iv. LOTOs on devices other than electrical must be initiated and tracked utilizing the Isolation Record Form (See Burns & McDonnell "Isolation Record" Safety Form G-13). Isolations that require more than one LOTO (electrical and/or mechanical) must also be tracked utilizing the Isolation Record Form.
      v. Prior to removing isolation, all holders must have signed off the Isolation Record and the Electrical Isolation Log.
      vi. Only the LOTO Manager, Tagging Authority or designated Authorized Worker is authorized to place or remove tags.
      vii. In the event a tag or tags are found either missing or lying on the ground, they are to be reported to the LOTO Manager or his designee A.S.A.P.! Do NOT assume you know where they are to be placed or replace them yourself. Upon notification, the LOTO Manager shall immediately investigate and determine the status of the LOTO and if the tag can be reattached or a work stoppage is necessary for personnel or equipment safety.
      viii. All locking devices should be accompanied by a DNO tag and must be identified or traceable to the user by a name or unique number as determined by the lock user's supervisor. Locking devices not accompanied by a DNO tag are at risk of being removed, however the same stipulations shall apply for removal as described in an Emergency Release, listed below.
      ix. Failure to comply with the Tagging Procedure rules shall be considered just cause for discharge or removal of the persons involved from the job site.

      <u>Examples of failure to comply include the following:</u>

- Operating or working on a system or piece of equipment without obtaining a proper LOTO and or Permit to Work.
- Operating or working on a system or piece of equipment in violation of the tags in place.
- Removing tags from a system or piece of equipment without proper authorization.

x. System Under Test Tags must have the appropriate Tagging Authority's name on the tag. Only the person whose name is on the tag is authorized to operate or direct the operation of that device/system and or remove the tag.

xi. LOTO Isolation Records and/or PTW requests are directed to and approved by the LOTO Manager or his designee (Burns & McDonnell "Tagging Authority List" Safety Form G-11 for identification of the Tagging Authorities and their assigned areas of responsibility).

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xii. Emergency Release: Under extraordinary circumstances, it may be necessary to remove a lock or tag that has been affixed by someone else or without the proper signoff of a holder. Only the LOTO Manager or his designee may authorize the removal of a lock or tag and only in accordance with the following stipulations:

(A) The worker who is responsible for the lock or tag or is a holder of the isolation is not present at the facility, and all reasonable efforts have been taken to contact the responsible worker.

(B) All measures are taken to notify the worker prior to his resuming work.

(C) In addition, if the lock or tag is on an item that is in the construction or startup stage, the authorization of the project field manager or startup manager will also be required, respectively. A log will be kept to document these authorizations.

b. LOTO Sequence

Once it is determined that a LOTO is required, the following sequence is followed:

i. LOTO Manager or designate approves the isolation request from the Tagging Authority, ensuring that all sources of hazardous energy will be safely controlled.

ii. Lockout devices and tags are issued for the isolation by the LOTO Manager or designate, and affected workers are notified of the actions to be taken.

iii. Energy isolating devices are located or operated by the LOTO Manager or designee to properly isolate hazardous energy from the area or equipment to be protected.

iv. Lockout devices and tags are affixed to the energy isolating devices by the appropriate Tagging Authority under the witness of the LOTO Manager or his designee.

v. Any stored energy is released (by venting, draining, grounding, ventilating, including release or securing of potential energy sources such as compressed springs and elevated weights, etc.).

vi. Effectiveness of isolation is verified (by visual inspection, voltage testing, attempt to operate, portable gas detector ("sniffer"), etc.) by the Tagging Authority, and LOTO Manager or his designee.

vii. Personnel are then authorized to commence work once they have signed on as holders of the isolation.

viii. After work is completed, all personnel sign off as holders and the proper restored condition of the equipment or area is confirmed (cleanliness, proper completion of work – everything put back together properly, bolts tight, protective guards on, etc.).

ix. Tagging Authority or designate requests the removal of the isolation. LOTO Manager or designee reviews the LOTO for approval to remove isolations and reinstate the system.

x. Tagging Authority takes responsibility to ensure equipment and devices are in a safe condition (i.e. status of energy isolating devices is safe for the level of completion or status of the equipment – operational or otherwise)

NOTE: *Certain types of equipment may have specific startup instructions from the manufacturer or resulting from a Process Hazard Analysis conducted under the provisions of 29 CFR 1910.119, Process Safety Management.*

2. Construction Stage Activities:
The Construction stage starts at site mobilization and lasts through construction execution, and ends on a system by system basis as the systems are turned over to Startup.

   a. The Project Field Manager and or LOTO Manager shall ensure the following:
      i. All personnel are properly identified as Other, Affected, Authorized, or Tagging Authority and are properly trained.
      ii. Maintain records of training (Records of training will be maintained by the LOTO Manager or designated alternate).
      iii. Implementation of the Safety Tagging / Hazardous Energy Control Program in accordance with this procedure.

   b. Tagging authorities and their areas of responsibility are defined in Burns & McDonnell "Tagging Authority List" Safety Form G-11. This list will be updated and redistributed as necessary by the LOTO Manager.

   c. Electrical lockout on Motor Control Centers (MCC) will be executed by applying DNOs and lockout devices on all MCC breakers prior to energization of the MCC. The responsible Tagging Authority must sign onto the Electrical LOTO Log to hold the LOTOs for each breaker (see Burns & McDonnell "LOTO Log" Safety Form G-10).

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   d. LOTOs on devices other than electrical must be initiated and tracked utilizing the Isolation Record Form (See Burns & McDonnell "Isolation Record" Safety Form G-13). Isolations that require more than one LOTO (electrical and/or mechanical) must also be tracked utilizing the Isolation Record Form.

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   e. Construction Stage LOTO Sequence
      i. Affected workers are responsible for requesting a LOTO through an Authorized Worker.
         (A) Affected workers must also confirm that the LOTO has been properly executed prior to performing any work on systems where equipment has reached the stage where operation / energization is possible and such operation or energization could result in injury to personnel or equipment. (On electrical systems, work must not be performed on locked breakers without first signing on to the corresponding LOTO as a holder).
      ii. Tagging Authority or Authorized Workers request permission for a LOTO from the LOTO Manager by completing an Isolation Record.
      iii. The LOTO Manager, or designate, will complete the following:
         (A) Determine if it is safe to perform the planned work and what LOTO conditions are required to ensure the safety of personnel and equipment.
         (B) Finalize the Isolation Record, listing all items to be locked out and tagged, and sign approval on the Isolation Record (approval for placing isolation).
         (C) Ensure lockout tagout is executed properly.

iv. Any LOTO executed under an Isolation Record must have the IR # written on the DNO tags.
(A) Release the requesting party to sign the Isolation Record as a holder and proceed with work.

v. If an electrical isolation is included the Isolation Record number must be entered in the appropriate column on the Electrical Log sheet. At least one of the Isolation Record Holders must sign onto the Electrical LOTO Log (preferably the lead person responsible for the work).

NOTE: *The LOTO Manager may delegate all of the above tasks, except for step 1, "Determination", to an Authorized Worker he/she deems qualified; however, the Tagging Authority will still be responsible for the proper implementation of the LOTO program*.

(A) The requesting Tagging Authority or designee signs the Isolation Record and Electrical LOTO Log, if applicable, indicating himself as having confirmed the LOTO and as a holder of the LOTO (no one else can remove the LOTO without his/her signoff, except in emergency per procedure page 3).
(B) Upon completion of work, all Authorized Workers signed onto the Isolation Record and the Electrical LOTO Log shall sign off and notify the responsible Tagging Authority that they are signed off.
(C) When the last Authorized Worker signs off of the Isolation Record and or the Electrical LOTO Log, The responsible Tagging Authority must determine if the LOTO should be removed or left on.

vi. If the LOTO is to be removed, the Tagging Authority shall sign off and ask the LOTO Manager to remove the LOTO (note: in the case of MCC breakers, LOTOs should remain on unless there is a specific purpose for removing them).

vii. If the LOTO is not to be removed, the Tagging Authority remains signed onto the Isolation Record or LOTO Log, in order to keep the LOTO active.

viii. System Under Test (SUT) tags can be used by construction as advisories or measures of control for construction testing activities if required. The tag must clearly be labeled "Construction Testing" and have the Tagging Authority's name written on the tag (testing activities such as Hydro, etc.).

3. Startup Stage Activities

The Startup stage starts on a system by system basis when construction turnover of a system is accepted by Startup as mechanically complete (in accordance with project turnover procedure). This status is indicated in the field by the presence of System Under Test (SUT) tags on major equipment, valves, etc. The Startup stage ends on a system by system basis as the system is accepted by Operations as substantially complete.

a. The LOTO Manager and or Startup Manager shall ensure the following:

i. All personnel are properly identified as Other, Affected, Authorized, or Tagging Authority and are properly trained.

ii. Maintain records of training and testing (Records of training will be maintained by the LOTO Manager or designated alternate).

iii. Implementation of the Safety Tagging / Hazardous Energy Control Program in accordance with this procedure.

b. Tagging authorities and their areas of responsibility are defined on the Burns & McDonnell "Tagging Authority List" Safety Forms G-11. This list will be updated and redistributed as necessary.

i. Upon acceptance of a system from construction, the startup Tagging Authority assigned to that system will assume control of the LOTO functions for that system. Actions required are as follows:

(A) Status of the corresponding Electrical LOTO Log sheets for equipment included in the system will be changed from Construction to Startup and the New Tagging Authority defined on each log sheet.
(B) System Under Test (SUT) tags will be hung on all major equipment, major system valves (including boundary valves) and corresponding electrical breakers except where an existing LOTO may interfere). The startup Tagging Authority's name must be entered on all SUT tags hung on field equipment.

c. The general sequence of LOTO for the Startup stage is the same as during the construction stage, except for the following clarifications:
   i. The Responsible Tagging Authority will be a startup person who is assigned to the respective system as indicated in Burns & McDonnell "Tagging Authority List" Safety Form G-11.
   ii. ALL work to be performed by construction on systems under the control of startup requires a work authorization under the PTW system PRIOR to commencement of work.

4. Operational Stage Activities
The Operational Stage starts on a system by system basis when startup turnover of a system is accepted by Operations as substantially complete (in accordance with the project turnover procedure). This status is indicated in the field by the presence of System Under Operations (SUO) tags on major equipment, valves, etc.

a. System Under Operations (SUO) tags will be hung on major equipment, major system valves (including boundary valves), and corresponding electrical breakers. SUT tags should be removed and returned to Startup at the same time.

b. The Client permanent plant LOTO program will be implemented upon transition from Startup to operations.

c. The general sequence of LOTO for the Operational stage is the same as during the Construction and Startup Stages, except for the following clarifications:
   i. The Responsible Tagging Authority will be an Operations Supervisor as indicated in Burns & McDonnell "Tagging Authority List" Safety Form G-11.
   ii. ALL work to be performed by construction on systems under the control of operations requires a work authorization under the PTW system PRIOR to commencement of work.
   iii. ALL work to be performed by startup except for required troubleshooting/problem solving, and optimization on systems under the control of operations requires a work authorization under the PTW system PRIOR to the commencement of work.

5. Permit To Work (PTW) Procedure
A PTW work authorization is required in the following circumstances.

a. ALL work to be performed by construction on systems under the control of startup or operations requires a work authorization under the PTW system PRIOR to commencement of work!
b. ALL work to be performed by startup except for required troubleshooting/problem solving, and optimization on systems under the control of operations requires a work authorization under the PTW system PRIOR to the commencement of work.
c. PTW Sequence
   i. A request for a PTW work authorization can be initiated by any Tagging Authority or designated Authorized worker by completing the "Requestor" section of the PTW form and submitting it to the LOTO Manager or designee. (See Burns & McDonnell "Work Permit" Safety Form C-7)

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ii. The requesting party shall determine if a LOTO is required. If a LOTO is thought to be required the requesting party must complete an Isolation Record with the proposed isolation and submit it with the PTW form to the LOTO Manager (See Burns & McDonnell "Isolation Record" Safety Form G-13).

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iii. The LOTO Manager or designee shall review the PTW requestor information and makes a determination as to whether the work can be allowed to proceed (for example will it interfere with other startup or operations plans that take precedence).

(A) If work cannot proceed the LOTO Manager checks "NO" in the approved box, signs and dates the PTW form, and returns the original to the requestor (also stating the reason in the comments section).

(B) If work can be allowed, the following steps shall be followed

(1) The LOTO Manager or his designee makes the final determination as to whether a LOTO or additional permits are required in order to ensure the work can proceed safely.

(2) Procedures for the execution of additional permitting or planning requirements are defined in the project safety manual. Examples of other permits or plans which may be required are Confined Space Entry Permit (CSE), Hot Work Permit (HWP), or Activity Hazard Analysis (JHA).

(C) If a LOTO is not required, the LOTO Manager ensures "NO" is checked in the LOTO required box and checks "YES" in the approval box, signs and dates the PTW form, and returns the original to the requestor.

(D) If a LOTO is required, the Tagging Authority ensures the LOTO required "YES" box is checked, checks "YES" in the approval box, signs and dates the LOTO request and the following steps will be followed.

(1) The LOTO Manager or designate reviews the LOTO Isolation Record and confirms that the proposed isolation will ensure the safety of personnel and equipment. The Isolation Record shall be modified as required to ensure safety.

(2) The LOTO Manager or designate approves the Isolation Record and executes the LOTO in accordance with the Isolation Record.

(3) The Tagging Authority or designate establishes DNO tags and completes the corresponding information on the Isolation Record and the Electrical LOTO Log sheets if applicable.
NOTE: DNO tags must have the corresponding Isolation Record number written on them.

(4) The Tagging Authority or designate places each device in its' prescribed position, locks and tags the device as appropriate, and signs and dates the Isolation Record and the Electrical LOTO Log sheet (if electrical lockout is included) indicating that the lockout has been placed.

(5) The LOTO Manager or designate then signs and dates the isolation completed box on the PTW form.

(6) After completion of the LOTO the requestor must sign the Isolation Record as a holder of the LOTO and sign and date the PTW issued box on the PTW form.

(E) At the discretion of the Tagging Authority or designate, additional personnel can sign directly on to the Isolation Record as holders if their scope of work was included in the original PTW requestor information. If the scope of work was not included an additional PTW must be requested and if deemed appropriate, the same Isolation Record can be used.

(F) Personnel who want to hang their own locks can hang them only if their lock is identifiable as belonging to them and only after they have signed as a holder of the Isolation Record. Individual or personal locks used on Electrical isolations must also be logged in the LOTO log book to record all of the locks that are approved to be on that device.
(1) The original of the PTW form is then given to the requestor and serves as a work authorization.

iv. PTW work authorizations must either be in the possession of the person performing the work or in the vicinity of the work and accessible upon request.

v. The requestor is responsible to keep the LOTO Manager apprised of the work progress and whether there is any significant change in the work scope or expected duration.
(A) Upon completion of the work, the requestor (holder) must return the PTW to the LOTO Manager or designate and sign off the PTW and the Isolation Record.
(B) Once all holders are signed off the Isolation Record, the Tagging Authority or designate removes the isolation, returns the devices to the proper position or status (ensuring that a safe condition exists), and signs and dates the Isolation Record and Electrical LOTO Log, if applicable, as removed or released.

6. Implementation Instructions

a. Lock Out / Tag Out Setup
During construction, the LOTO Manager or designate initiates the first steps of the LOTO program by executing the following actions:

i. Establish an Electrical LOTO Log book that includes the following:
(A) Establish an Electrical Isolation section with a Log Sheet for each breaker or other electrical isolating device (See Burns & McDonnell "LOTO Log" Safety Form G-10).

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(B) Log sheets will be organized by MCC or other logical grouping of electrical devices.
(C) Isolation Record section for mechanical equipment.

b. Panel Safety Tagging
After each panel or DCIS cabinet is turned over to Startup or Operations, a SUT or SUO tag will be placed on the panel door with instructions to contact the Control Room prior to opening any cabinet door. This is to alert everyone that terminals within the cabinet may be energized either by a source internal to the cabinet or external from the cabinet and that checkout activities are in some state of progress.

c. Group Lockout
When multiple isolation points, six (6) or more, must be controlled during a lockout, or when multiple persons (craft) are involved, a group lockout may be used.

i. Follow the steps for a normal lockout as documented in steps 1-6 above.

ii. Each key for the locks used shall be placed in a group lockout box. The group lockbox shall be kept in view of the work being performed when practical.

iii. A Job Control Lock shall be installed on the group lockbox by the Contractor's authorized tagging authority. This lock shall remain in place until the lockout has been completed. The key for the Job Control Lock shall be kept in the BMcD LOTO Manager's office, with the corresponding LOTO paperwork.

iv. Each worker covered by the lockout shall apply his/her lock and tag on the group lockout box.

v. Each worker shall remove their own lock when their portion of the work is completed. The Burns & McDonnell LOTO Manager or designee shall document the date/time that the lock/tag was removed and a signature of the person removing the lock shall be obtained.

vi. Upon completion of the work, the Burns & McDonnell LOTO Manager shall inspect the work area for completeness.

vii. When all of the conditions of the lockout termination procedures have been satisfied, the Job Control Lock shall be removed from the group lockbox.

7. Training Requirements

a. Prior to performing a job requiring Lockout / Tagout, training and verification of knowledge as outlined below shall be performed to ensure that the purpose and function of the Project Safety Tagging Program is clearly understood by all field workers.

b. Affected workers are required to be trained in the following areas:
   (i) The use of this procedure.
   (ii) Recognition of hazardous energy sources.
   (iii) Type and magnitude of hazardous energy present in workplace (potential danger).
   (iv) Potential hazards caused by failing to adhere to the Safety Tagging Program.

c. Authorized Workers are required to be trained in the following areas:
   (i) The use of this procedure.
   (ii) Recognition of hazardous energy sources.
   (iii) Type and magnitude of hazardous energy present in workplace (potential danger).
   (iv) Methods and means necessary for proper isolation and control.
   (v) Proper use of the following forms: Isolation Record, PTW, Electrical LOTO Log).
   (vi) Proper methods and sequencing for placing and removing LOTOs.
   (vii) Closing out PTW.

d. Other Workers are required to be trained in the following areas:
   (i) The purpose of the safety tagging program.
   (ii) The use and appearance of locks and tags.
   (iii) The potential hazards that locks and tags protect against.
   (iv) The penalties for removing locks and tags.
   (v) Prohibitions against attempting to operate locked or tagged equipment.
   (vi) Tagging Authority is required to be trained in the following areas:
      (A) The use of this procedure.
      (B) Recognition of hazardous energy sources.
      (C) Type and magnitude of hazardous energy present in workplace (potential danger).
      (D) Methods and means necessary for proper isolation and control.
      (E) Proper use of the following forms: Isolation Record, PTW, Electrical LOTO Log).
      (F) Proper methods and sequencing for placing and removing LOTOs.
      (G) Closing out PTW.
      (H) Considerations in determining if and when a requested work activity can be approved to proceed.
      (I) Proper delegation of LOTO functions and follow-up to ensure program is implemented properly.
      (J) Proper identification of the need for additional permits (Confined Space Entry, Hot Work Permit, Safe Work Plan), and establishment of these programs in accordance with the project safety manual.

e. Retraining:
   (i) Retraining will be provided for all affected and authorized workers under the following conditions:
      (A) Change in job assignment.
      (B) Change in machinery/equipment/process that presents a new hazard.
      (C) Change in the Safety Tagging Procedure.

(D) When deviations or inadequacies in worker's knowledge is identified.
(E) When deviations in the use of the Safety Tagging Procedure are identified.

8. The BMcD LOTO Manager or designated alternate shall maintain a record of all Tagging Authority, Authorized, Affected, and Other worker training efforts.
   a. A list of Authorized Workers will be kept and made available to Tagging Authorities for the purposes of verifying Authorized Workers.
   b. The Tagging Authority list (Burns & McDonnell "Tagging Authority List" Safety Form G-11) will be updated by the BMcD LOTO Manager on a routine basis as it becomes necessary to make adjustments to personnel and or assigned areas of responsibility.
   c. Copies of the updated Tagging Authority list will be maintained in the following locations:

      G-11

      (i) BMcD Construction Office (during construction stage)
      (ii) Control Room (during startup, and operations)

Occupational Noise Exposure 1926

Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-4 of this section when measured on the A-scale of a standard sound level meter at slow response.

Administrative or Engineering Controls

When workers are subjected to sound levels exceeding those listed in Table G-4 of this section, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of the table, personal protective equipment as required shall be provided and used to reduce sound levels to within the levels of the table.

Variations in Noise Level

1. If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

2. Impulsive or impact noise. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

3. In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

Table G- 4 Permissible Noise Exposure Levels	
Duration per day, hours	**Sound level, dBA, slow response**
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

1. When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. Exposure to different levels for various periods of time shall be computed according to the formula set forth below.

2. F(e)=(T(1)divided by L(1))+(T(2)divided by L(2))+ ... + (T(n) divided by L(n)) where:

   F (e) = The equivalent noise exposure factor.
   T = The period of noise exposure at any essentially constant level.
   L = The duration of the permissible noise exposure at the constant level (from Table G-4).
   If the value of F(e) exceeds unity (1) the exposure exceeds permissible levels.

3. A sample computation showing an application of the formula in paragraph (d)(2)(ii) of this section is as follows. An worker is exposed at these levels for these periods:

   110 dBA 1/4 hour 100 dBA 1/2 hour 90 dBA 1 1/2 hours

   F(e) = (1/4 divided by 1/2)+(1/2 divided by 2)+(1 1/2 divided by 8)
   F(e) = 0.500+0.25+0.188
   F(e) = 0.938
   Since the value of F(e) does not exceed unity, the exposure is within permissible limits.

Chapter H - Process Safety Management and HAZWOPER

Process Safety Management of Highly Hazardous Chemicals

Process Safety Management of Highly Hazardous Chemicals
Application
Worker Participation
Process Safety Information
Process Hazard Analysis
Operating Procedures
Training
Contractors
Pre-Startup Safety Review
Mechanical Integrity
Hot Work Permit
Management of Change
Incident Investigation
Emergency Planning and Response
Compliance Audits
Trade Secrets
Appendix A List of Highly Hazardous Chemicals, Toxics And Reactives
Appendix B Block Flow Diagram and Simplified Process Flow Diagram
Diagram (a) Block Flow
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Appendix C Compliance Guidelines and Recommendations for Process Safety Management
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Worker Involvement in Process Safety Management
Process Safety Information
Process Hazard Analysis
Operating Procedures and Practices
Worker Training
Contractors
Pre-Startup Safety
Mechanical Integrity
Non-Routine Work
Managing Change
Investigation of Incidents
Emergency Preparedness
Compliance Audits
Appendix D - Sources Of Further Information (Non-mandatory)

Process Safety Management of Highly Hazardous Chemicals

Hot Work Permit

The workplace shall issue Burns & McDonnell Health & Safety Form C-7 "Work Permit" for hot work operations conducted on or near a covered process.

C-7

1. The permit shall document that the fire prevention and protection requirements have been implemented prior to beginning the hot work operations; it shall indicate the date(s) authorized for hot work; and identify the object on which hot work is to be performed.

2. The permit shall be posted at the site until completion of the hot work operations.

Incident Investigation

Each incident which resulted in (Accident), or could reasonably have resulted (Near Miss) in a catastrophic release of highly hazardous chemical in the workplace shall be investigated using the Burns & McDonnell Health & Safety Form C-2 "Incident / Accident Investigation Report".

C2 Incident Form.doc

1. The incident shall be reported in conformance with Chapter C – Program Administration, part (3) "Reporting Requirements", the investigation shall be initiated as promptly as possible, with the report due to Corporate Health & Safety not later than 24 hours following the incident.

2. The incident investigation team shall consist of at least one person knowledgeable in the process involved, including a contract worker if the incident involved work of the contractor, and other persons with appropriate knowledge and experience to thoroughly investigate and analyze the incident.

3. The report shall be reviewed with all affected personnel whose job tasks are relevant to the incident findings including contract workers where applicable.

4. Incident investigation reports shall be retained for five years.

Emergency Planning and Response

Burns & McDonnell Health & Safety Form E-1 "EAP and Fire Prevention Plan" shall be completed and made available on site.

E-1

HAZWOPER

Hazardous Waste Operations and Emergency Response
Scope, Application, and Definitions
Health & Safety Program
Site Characterization and Analysis
Site Control
Training
Medical Surveillance
Engineering Controls, Work Practices, and Personal Protective Equipment for Worker Protection
Monitoring
Informational Programs
Handling Drums and Containers
Decontamination
Emergency Response by Workers at Uncontrolled Hazardous Waste Sites
Illumination
Sanitation at Temporary Workplaces
New Technology Programs
Certain Operations Conducted Under the Resource Conservation and Recovery Act Of 1976
Emergency Response Program to Hazardous Substance Releases

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- Selection

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Work Area Surveillance
Unknown Atmospheres
Additional Considerations

General Requirements

Application

If a hazard requires affected workers to use PPE - all workers within 10' of the (originally) affected workers shall be required to wear equivalent protection.

Hazard Assessment and Equipment Selection

The workplace shall verify that an activity hazard analysis (AHA) has been performed through a written certification that identifies the workplace evaluated; the person certifying that the AHA has been performed; the date(s) of the AHA; and, which identifies the document as an AHA. Burns & McDonnell Health & Safety Form C-12 "Activity Hazard Analysis".

C-12

Training

Training shall be provided to each worker required to use PPE. Documentation of training shall be submitted using Burns & McDonnell "Certification of Training" Health & Safety Form C-9 Each such worker shall be trained to know the following:

1. When PPE is necessary;
2. What PPE is necessary;
3. How to properly don, doff, adjust, and wear PPE;
4. The limitations of the PPE; and,
5. The proper care, maintenance, useful life and disposal of the PPE.

C-9

Head Protection

General Requirements

Affected workers shall wear a protective helmet in all work areas other than in the office/trailers.

1. The protective helmet designed to reduce electrical shock hazard shall be worn by affected workers when near exposed electrical conductors.
2. Workers name (first and last) shall be clearly visible on the front of the hard hat.
3. Burns & McDonnell projects shall require the use of a Class E/G hard hat
4. The Hard hats shall not be reversed even if suspension is reversed.

Criteria for Protective Helmets

Protective helmets shall comply with ANSI Z89.1-1986, American National Standard for Personal Protection-Protective Headwear for Industrial Workers-Requirements.

Occupational Foot Protection

Criteria for Protective Footwear

Each affected worker shall use protective footwear in all work areas other than in the office/trailers

1. Protective footwear shall comply with ASTM F2413-05 Performance Requirements for Foot Protection.

2. Footwear shall be of leather, or equivalent non-porous material, they shall extend above the ankle and have a defined heel.

Eye and Face Protection

General Requirements

Each affected worker shall use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.

Each affected worker shall use eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (e.g. clip-on or slide-on side shields) meeting the pertinent requirements of this section are acceptable.

Each affected worker who wears prescription lenses while engaged in operations that involve eye hazards shall wear eye protection that incorporates the prescription in its design, or wear eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Eye and face PPE shall be distinctly marked to facilitate identification of the manufacturer.

Affected worker shall use equipment with filter lenses that have a shade number appropriate for the work being performed for protection from injurious light radiation.

Hand Protection

General Requirements

Contractor / subcontractor employees shall be required to use appropriate hand protection at all times while on the project site, with exception given for field project offices and lunch / break areas, providing work activity requiring hand protection is not being performed.

Selection

Appropriate hand protection shall be selected based upon evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, the hazards and potential hazards identified, and in accordance with the minimum requirements of the Hand Protection Reference Guide.

Table I- 1 Hand Protection Reference Guide	
Activity / Exposure	**Glove Type**
Light lifting, moving boxes, etc.	Cotton, Leather, or cut-resistant
Handling lumber, steel, rebar, etc.	Leather or cut-resistant
Exposure to sharp edges, glass, box cutters, etc.	Cut-resistant
Exposure to open flame or molten metal, etc.	Insulating gloves w/ gauntlet cuff (welding glove, etc.)
Low Temperature	Insulating gloves
Electrical	Use appropriate PPE for high voltage - NFPA 70E
Chemical	Refer to MSDS / manufacturer recommendations

Respiratory Protection

General

Due to the respiratory hazards associated with chemical and dust exposures, respiratory protection is a crucial part of the Health and Safety Program. At no time shall an employee be forced to work in a hazardous situation without proper respiratory protection. Respiratory protection shall be in compliance with federal, state and local regulations. (29 CFR 1910.134 & 1926.103)

The nature of the hazard must be identified to make sure that and overexposure does not occur. Relevant factors include oxygen deficiency, physical and chemical properties of the hazard, physiological effects on the body, concentrations of the toxic substances, the Permissible Exposure Limits (PEL) and warning properties (odor, skin or upper respiratory irritation).

When feasible engineering controls are not enough to control airborne hazardous materials, the contractor shall provide respiratory protective equipment for its employees. NIOSH, OSHA and EPA safety criteria will be used as guidelines for selecting the equipment. Only NIOSH approved respiratory protective equipment shall be used. Employees who are required to use the respirators will be medically screened, properly fit-tested, fitted with the appropriate respirator and filters, and trained.

The effective use of a respirator depends on an individual's ability to wear a respirator, which must be determined by a physician or other licensed health care professional (PLHCP).

Burns and McDonnell employee owners working at the project site who are required to utilize respiratory protection shall refer to the Burns & McDonnell Policy Manual, Chapter 8 for respiratory protection program requirements.

Burns & McDonnell employee owners are not allowed, under any circumstances, to enter any work area containing an atmosphere with unknown concentrations of a hazardous air contaminant or a measured atmosphere determined to be Immediately Dangerous to Life or Health (IDLH).

The IDLH levels for many substances are published by the National Institute for Occupational Safety and Health (NIOSH). Air monitoring must be performed to determine air contaminant levels prior to respiratory protection equipment selection and prior to entry into an unknown concentration during routine entry or emergency releases of hazardous chemicals.

Duration of Respiratory Protection Use

The length of time a respirator will be worn by an employee owner must be evaluated. This is very important when using a self-contained breathing apparatus (SCBA) in which the air supply is limited, or when using an air-purifying respirator whose filter cartridges can become clogged or saturated to the point that they do not protect the worker from gases and vapors. Therefore, a respirator cartridge change-out schedule will be implemented depending upon the type and concentration of chemicals expected to be present

Selection of Respirators

The two general types of respirators typically used include:

1. Air-purifying respirators use cartridges or particulate air filters to remove contaminants from the breathing zone.

2. Air-supplying respirators use supplied air from compressed air tanks or air compressors.

3. Respirators for IDLH atmospheres. Even with an appropriate respirator *under no circumstances* shall an IDLH atmosphere be entered.

Assigned Protection Factors (APF)

The protection afforded by respirators depends on the seal of the face-piece to the face; no leakage should be evident around valves and through or around cartridges or canisters. Depending on these criteria, the degree of protection may be ascertained and a relative safety factor assigned. Protection factors are only applicable if all elements of an effective respirator program are in place and being enforced. APFs are used to determine what type of respiratory protection is required to be worn depending upon the hazardous atmosphere. Respirators may be worn in atmospheres where the contaminants are less than the APF when multiplied by the Occupational Safety and Health Administrations Permissible Exposure Limit.

Table I- 2 Respirator Assigned Protection Factor	
Type of Air Purifying Respirator	**Assigned Protection Factor, APF**
Maintenance-Free and Dual Cartridge-Half Face	10
Maintenance-Free and Dual Cartridge-Full Face	50
Note: *To Achieve an APF of 50, a quantitative fit test is required.*	
Powered Air Purifying	

Fit Testing

Employees whose work includes tasks that require respirator use will be fit tested to determine if a proper face-piece-to-face seal has been accomplished. However, they must first be medically cleared to wear a respirator.

If a successful fit-test cannot be achieved, alternate sizes and manufacturer's equipment will be tried and tested. If a proper seal remains unattainable, the employee may be offered a powered-air-purifying-respirator (PAPR), a supplied-air respirator, or will not be allowed to perform work requiring respiratory protection

Field Tests

Positive and negative pressure fit tests are used to check the seal of the respirator being used in the field. Both tests must be performed each time a respirator is put on and prior to entering a contaminated area. Although the positive and negative tests are essential to a good respiratory protection program and should always be used prior to entering an area of exposure, they are solely used as a field test and cannot be substituted for the qualitative or quantitative fit test.

Inspection, Cleaning, Maintenance, and Storage

Respirators must be stored in a clean area unlikely to be contaminated by the work in progress. They should be stored in a secure atmosphere, such as a plastic bag, in a way that does not deform the shape of the face-piece.

Employees will be responsible for the inspection, cleaning and maintenance of their own air-purifying respirators. The respirators will be inspected by the employee prior to and after each use. Cleaning and disinfecting will be performed after each day's use (or sooner if necessary). Only employees who have completed the appropriate training courses and are qualified can perform maintenance on respirators.

Training and Information

Training shall be provided prior to requiring the worker to use a respirator in the workplace. At a minimum, all employees using respirators will be trained in basic respirator practices, their Respiratory Protection Program, the hazards of the job and related topics required by the OSHA regulations in 29 CFR 1910.134. This training shall be documented via Burns & McDonnell Safety Form I-1 "Respirator Training Record".

I-1

Respirators are effective only when they are fitted to the employee owner and worn properly. Since proper use often depends upon the wearer's motivation, it is important that the need for the respirator be explained fully.

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- **Appendix A** Decompression Tables

Excavation Requirements

Site specific excavations requirements shall be determined (and followed) using Burns & McDonnell Site Specific Excavation Plan Safety Form J-1.

Any excavation which is bodily entered by any worker must first be inspected by a competent person using Burns & McDonnell Excavation Inspection Safety Form J-2. The form shall be completed at the start of each shift, posted at the entrance to the excavation and updated as often as necessary.

J-1 J-2

Requirements for Protective Systems

Protection of Workers in Excavations

Burns & McDonnell Selection of Protective Systems Safety Form J-5 shall be used to determine requirements.

J-5

Appendix A - Soil Classification

Requirements

Basis of classification - The classification of the deposits shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by a competent person using the tests described in Burns & McDonnell Soil Classification Safety Form J-3. This completed form shall be transmitted to Burns & McDonnell as documentation of the soil classification.

J-3

Appendix B - Sloping and Benching

Requirements

Soil classification - Soil and rock deposits shall be classified in accordance with appendix A of this chapter. Burns & McDonnell Soil Classification Safety Form J-3 shall be transmitted to Burns & McDonnell as documentation of the soil classification.

J-3

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- Transfer of Records

Medical Services and First Aid

Incident Accident Injury Tracking Log

The Burns & McDonnell "Incident Accident Injury Tracking Log" Safety Form K-1, log will be utilized to track all first aid cases on the project.

K-1

First Aid Kits

First aid kits shall be checked by the employer before being sent out on each job. While on the project site the first aid kits shall be inspected at least weekly to ensure that the expended items are replaced. The Burns & McDonnell "Weekly First Aid Kit Inspection" Safety Form K-2, shall be used to document the weekly inspections.

K-2

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29 CFR 1926.152
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Fire Brigades

Fire Brigades

Fire Brigades shall not be utilized. Trained workers are only authorized to combat fires at the incipient stage.

Flammable and Combustible Liquids

"Fire control for flammable or combustible liquid storage"

1. At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.

2. At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

3. At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids.

Temporary Aboveground Storage Tanks

General requirements

Provide a completed initial installation checklist (Burns & McDonnell Safety and Health Form L-2, Initial Installation Checklist for Aboveground Flammable and Combustible Liquid Tanks) to the project manager for approval prior to installation of the temporary storage tank. The installation checklist includes items for the following:

L-2

1. Storage Tank Design -Atmospheric

2. Normal Venting for Tanks

3. Emergency Relief Venting for Fire Exposure

4. Tank System Corrosion Protection

5. Foundations for and Anchoring of Tanks

6. Location with Respect to Property Lines, Public Ways, and Important Buildings on the Same Property

7. Shell-to-Shell Spacing Between Any Two Adjacent Aboveground Tanks

8. Control of Spills from Aboveground Tanks

9. Collision Protection for the tank(s)

10. Testing Requirements for Tanks

11. Fire Prevention and Control

12. Emergency Planning and Training

13. Inspection and Maintenance

14. Prevention of Overfilling of Tanks

Inspection, Maintenance and Testing

The aboveground flammable and combustible liquid storage tank(s) shall be inspected monthly using Burns & McDonnell Safety and Health Form L-3, "Aboveground Storage and Dispensing Tanks Monthly Inspection Checklist". The checklist includes items for the following:

L-3

1. Identification markings

2. Labeling

3. Spill control and spill containment maintained for

4. Equipment is in good repair and safe operating condition

5. Alarms, interlocks, and controls are tested and working

6. Demarcation of hazard areas is in place

7. Ignition source controls in place for

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Shackles and Hooks
Handling Materials
Use of Mechanical Equipment
Secure Storage
Housekeeping
Clearance Limits
Rolling Railroad Cars
Guarding

General Requirements for Equipment

General

All equipment shall have a daily pre-use inspection performed prior to each shift of operation, using the appropriate Burns & McDonnell Safety form, e.g. Burns & McDonnell Safety form N-8 "Daily Construction Vehicle Pre-Use Inspection Checklist", Burns & McDonnell Health & Safety Form N-5 "Daily Forklift Pre-Inspection" or Burns & McDonnell "Crane Inspection" Safety Forms N-1A or N-1B

N-1A N-1B N-5 N-8

1. All equipment operators shall be trained and qualified to operate the specific equipment

2. Operator's license in accordance with OSHA (Burns & McDonnell Safety Form C-21 "OSHA Required Training and Training Guidelines" as identified on the Burns & McDonnell Safety Form C-9 "Certification of Training"

   C-9

Cranes and Derricks

General

Superintendents, General Foremen, Foremen, or other members of management (persons supervising workers) shall not operate cranes on Burns & McDonnell projects.

Cranes and Derricks in Construction

Cranes and Cranes and Derricks Used in Demolition and Underground Construction

Crane Inspection and Lift Plan Submittal:

An annual third party crane inspection shall be conducted and shall be submitted to Burns & McDonnell prior to the use of any crane on site. This inspection shall be performed by a qualified crane inspector or by a certified inspection service.

This procedure shall in no way eliminate any requirements set forth for crane inspections in the OSHA Standard 1926.1400.

Lift plans shall be completed for all lifts that are over 20 tons, lifts that involve more than one crane or the load to be lifted exceeds 75% of the manufacturer's load rating chart for configuration of the crane. Burns & McDonnell Safety & Health Form N-2 "Critical Lift Plan" shall be used to document this information.

N-2

Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for the type of crane in use. An illustration of the signals shall be posted at the job site Burns & McDonnell Safety & Health Form N-4 "Hand Signals".

N-4

A competent person shall inspect all machinery and equipment prior to each use, and during use, to make sure it is in safe operating condition. Competent persons shall be designated on Burns & McDonnell Safety & Health Form C-17 "Competent Person Designation". Any deficiencies shall be repaired, or defective parts replaced, before continued use.

C-17

A third party annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor. The employer shall maintain a record of the dates and results of inspections for each hoisting machine and piece of equipment. No crane shall be used on a Burns & McDonnell project prior to transmittal of the inspection document to Burns & McDonnell.

General requirements

The use of a crane or derrick to hoist workers on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions. This use must be approved by Burns & McDonnell Corporate Safety & Health. The Burns & McDonnell Safety & Health Form N-3 "Suspended Personnel Platform Checklist" shall be completed and submitted to Burns & McDonnell for approval prior to use.

N-3

Material Hoists, Personnel Hoists, and Elevators

Personnel Hoists

Following assembly and erection of hoists, and before being put in service, an inspection and test of all functions and safety devices shall be made under the supervision of a competent person designated to Burns & McDonnell by transmittal, Burns & McDonnell Health & Safety Form C17 "Competent Person Designation. A similar inspection and test is required following major alteration of an existing installation.

All hoists shall be inspected and tested at not more than 3-month intervals. A certification record which includes the date the inspection and test of all functions and safety devices was performed; the signature of the person who performed the inspection and test; and a serial number, or other identifier, for the hoist that was inspected and tested shall be maintained onsite.

C-17

These hoists shall be inspected and maintained on a weekly basis, using Burns & McDonnell Health & Safety Form N3 "Suspended Personnel Platform Checklist". Whenever the hoisting equipment is exposed to winds exceeding 35 miles per hour it shall be inspected and put in operable condition before reuse.

N-3

Conveyors

General Requirements

Conveyors shall be locked out using the Burns & McDonnell Health & Safety Form G1 – Lockout Tagout Procedure or otherwise rendered inoperable, and tagged out with a Do Not Operate tag during repairs and when operation is hazardous to workers performing maintenance work.

G-1

Powered Industrial Trucks

Operator Training

Certification - The employer shall certify that each operator has been trained and evaluated. The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation. Documentation of the certification shall be transmitted to Burns & McDonnell via Burns & McDonnell Health & Safety Form C-9 “Certification of Training”. Additionally, all PIT operators shall carry on their person documentation of their training (card, hard hat sticker, etc.)

C-9

Maintenance of PITs

PITs shall be examined before being placed in service, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination shall be made at least daily and documented via Burns & McDonnell Health & Safety Form N-5 “Daily Forklift Pre-Inspection”.

N-5

Rigging Equipment for Materials Handling

General

Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service. Inspections shall be documented using the Burns & McDonnell Health & Safety Form N6 “Rigging Inspection Record”.

N-6

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- Lifting and Hauling Equipment Refueling
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- Maintenance of the Lifting and Hauling Equipment

Pile Driving Equipment
- General Requirements
- Barges or Floats
- Pile Driving Equipment

Motor Vehicles Project Program

Coverage

This procedure covers all motor vehicles that operate on the project jobsite. All vehicles regardless of ownership, including employee owned or leased vehicles being used for company business; company rented or fleet vehicles; and Contractor vehicles, including but not limited to: automobiles, trucks, utility vehicles (gators, carts, mules, etc.)

Objective:

The primary objective of the motor vehicle project safety program is to prevent injuries, deaths and expenses related to vehicular accidents while operating at the jobsite.

General Requirements

1. All motor vehicles operating on the project site shall
   a. Be checked using Burns & McDonnell Safety & Health form O-1 "Vehicle Checklist" at the beginning of each shift to assure that the equipment is in safe operating condition. Defects shall be corrected before vehicles are placed in service
   b. Have a service brake system, an emergency brake system, and a parking brake system, and shall be maintained in operable condition.
   c. Be equipped with at least two headlights and two taillights in operable condition.
   d. Have brake lights in operable condition.
   e. Be equipped with an operable audible warning device at the operator's station.
   f. Have seats adequate for the number of workers to be carried.
   g. Have Seat belts and anchorages installed.
   h. Be backed in to parking spots

2. All equipment shall have an un-obstructed view to the rear unless:
   a. The vehicle has a reverse signal alarm or:
   b. The vehicle is backed up only when an observer signals that it is safe to do so.
   c. Or the vehicle horn must be sounded before backing the vehicle.

3. All vehicles with cabs shall be equipped with windshields, and operable windshield washers and powered wipers.
   a. Cracked and broken glass shall be replaced.
   b. Vehicles shall be equipped with operable defogging or defrosting devices.

4. All hauling vehicles shall have a cab shield and/or canopy adequate to protect the operator from shifting or falling materials.

5. Tools and material shall be secured to prevent movement when transported in the same compartment with workers.

6. Dump Trucks
   a. Operator's station of dump trucks shall be clear of dump area.
   b. Dump trucks shall be capable of being locked in position to prevent accidental lowering of the body.
   c. Operating levers shall be equipped with a latch or other device which will prevent accidental starting or tripping of the mechanism.

7. All pneumatic rubber-tired motor vehicles shall be equipped with fenders.
   a. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

Earthmoving Equipment

General

All equipment on Burns & McDonnell projects shall be equipped with roll over protective structures.

Audible alarms

All bi-directional equipment, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

Earthmoving or compacting equipment which has an obstructed view to the rear shall not be used in reverse gear unless the equipment has a reverse signal alarm or a worker (spotter) signals that it is safe to do so.

Scissor points on equipment shall be guarded.

Where necessary for safe operation a spotter or spotters, equipped with Hi-visibility vests, flags, horns or the like, shall be used for moving equipment.

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- Power Lawnmowers

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- Abrasive Blast Cleaning Nozzles

Hand and Portable Powered Tools and Other Hand-Held Equipment

General Requirements

Each company shall be responsible for the safe condition of tools and equipment used by workers, including tools and equipment which may be furnished by the workers.

The Burns & McDonnell Health & Safety Form P1 - Hand & Portable Power Tools Pre-Operation Inspection Checklist can serve as a basis for the daily pre-use inspection of the tools, as well as to document the monthly inspection.

P-1

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Gas Welding and Cutting

Hose

Flashback arrestors shall be used at both the gauge and the torch end of the hose.

Additional Rules

For additional details not covered in this chapter, applicable technical portions of American National Standards Institute, Z49.1-1967, Safety in Welding and Cutting, shall apply.

Arc Welding and Cutting

Ground Returns and Machine Grounding

The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

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When welding on galvanized metals a respirator with a P100 filter is required.

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Electric Power Generation, Transmission, and Distribution

General

Training

Workers shall be trained in and familiar with the safety-related work practices, safety procedures, and other safety requirements in this section that pertain to their respective job assignments. Workers shall also be trained in and familiar with any other safety practices, including applicable emergency procedures, that are not specifically addressed by this section but that are related to their work and are necessary for their safety. Documentation of this training shall be submitted via Burns & McDonnell Pole & Bucket Rescue Safety Form R-2.

R-2

Job Briefing

Daily job briefing is required, using Burns & McDonnell Daily Job Briefing Safety Form R-1, and shall be conducted with all the workers involved before they start each job.

R-1

Personal Protective Equipment

Fall protection equipment shall be inspected Burns & McDonnell Safety Form R-8 "Fall Protection Equipment Inspection". See Chapter V, Personal Protective Equipment for additional PPE requirements.

V-2

Crane Lifting Plans

A pre-lift crane permit Burns & McDonnell Safety Form R-4 "Pre-Lift Crane Permit" and pre-lift safety checklist Burns & McDonnell Safety Form R-5 "Pre-Lift Safety Checklist" shall be completed prior to any crane lifts to verify reasons for lift, description of work responsibilities, crane inspection & operator qualifications, the lift plan and lift crew meeting / PTA.

R-4 R-5

Substations

Upon entering an attended substation, each worker other than those regularly working in the station shall report his or her presence to the worker in charge in order to receive information on special system conditions affecting worker safety.

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Telecommunications

Tools and Personal Protective Equipment

Personal protective equipment, protective devices and special tools needed for work shall be provided and used. Daily a competent person shall inspect and ensure that these personal protective devices, tools, and equipment are in good condition. Burns & McDonnell Daily Job Briefing Safety Form R-1

R-1

Personal Climbing Equipment

General - Harnesses with safety belts and straps shall be provided and used when work is performed at positions more than 4 feet above ground, on poles, and on towers. Inspection of this equipment shall be completed daily, using the Burns & McDonnell Safety Form V-2 "Fall Protection Equipment Inspection".

V-2

Vehicle-Mounted Material Handling Devices and Other Mechanical Equipment

Visual inspections of equipment shall be made by a competent person each day the equipment is to be used to ascertain that it is in good condition. Burns & McDonnell Boom Truck Inspection Safety Form R-3

R-3

Derrick Trucks and Similar Equipment

Derricks and its associated equipment are to be inspected by a competent person at intervals set by the manufacturer but in no case less than once per year. Records shall be maintained including the dates of inspections, and necessary repairs made, if corrective action was required. Burns & McDonnell Boom Truck Inspection Form R-3

R-3

Underground Lines

Requirements prior to entering manholes and unvented vaults

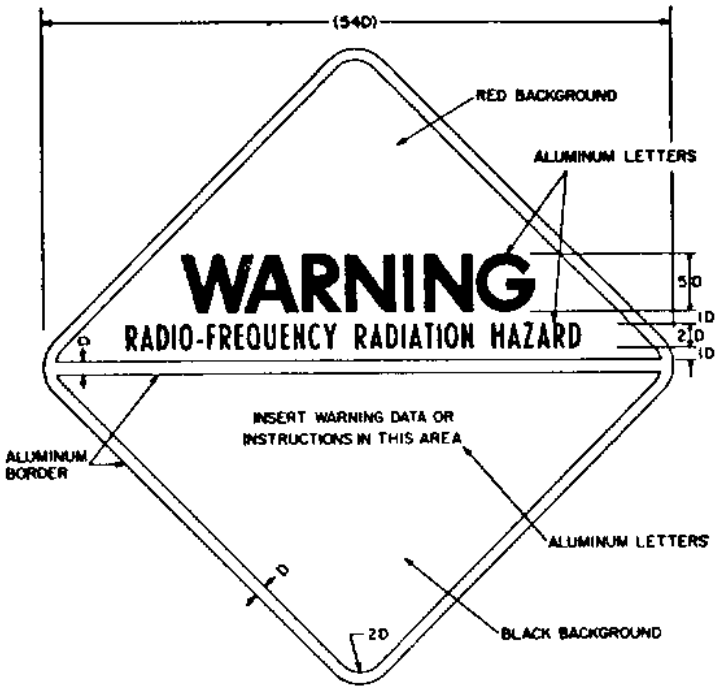
Before a worker enters a manhole, a Confined Space permit is to be completed. Burns & McDonnell Safety Form C-7 "Work Permit" (Confined Space Entry Section)

C-7

Definitions

For definitions for this Chapter refer to definitions within 1910.269 - Electric Power Generation, Transmission, and Distribution.

Appendix B - Radio Frequency Radiation Hazard Sign:



1. Place handling and mounting instructions on reverse side.
2. D = Scaling unit.
3. Lettering: Ratio of letter height to thickness of letter lines.

Upper triangle :	5 to 1	Large
	6 to 1	Medium
Lower triangle	4 to 1	Small
	6 to 1	Medium

4. Symbol is square, triangles are right-angle isoseles.

Figure G-11

Radio-Frequency Radiation Hazard Warning Symbol

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Electrical Safe Work Practices

Electrical Safe Work Practices

1. **Contractor Relationships**
   a. **Host Site Responsibilities.**
      i. The host site shall inform the contractor of:
         (A) Known electrical hazards related to the contract that might not be recognized by the contractor's employees
         (B) Pertinent electrical information the contractor needs to make the required safety assessments.
   b. **Contractor Responsibilities.**
      i. The contractor shall ensure that each of his workers is instructed in the electrical hazards communicated host site.
      ii. The contractor shall ensure that each of his workers follows electrical safe work practices including City of Stillwater safety-related work rules.
      iii. The contractor shall advise the host site of:
         (A) Any unique hazards presented by the his work,
         (B) Any unanticipated hazards found during the work
         (C) Any additional needed measures taken to perform the work
2. **Training Requirements.**
   a. **Safety Training.**
      i. The training requirements shall apply to employees who face a risk of electrical hazard that is not reduced to a safe level by the applicable electrical installation requirements.
      ii. Employees shall be trained to understand the specific hazards associated with electrical energy.
      iii. They shall be trained in the safety-related work practices and procedural requirements needed to provide protection from the electrical hazards associated with their work
      iv. Employees shall be trained to identify and understand the relationship between electrical hazards and possible injury.
      iv. The training shall be classroom, on-the-job, or a combination of the two.
   b. **Emergency Procedures.**
      i. Employees exposed to shock hazards shall be trained in methods of release of victims from contact with exposed energized electrical conductors or circuit parts.
      ii. Employees shall be regularly instructed and annually certified in methods of first aid and emergency procedures, such as approved methods of resuscitation, if their duties warrant such training.
   c. **Employee Training.**
      i. Qualified Person - A qualified person shall be trained and knowledgeable of the construction and operation of equipment or a specific work method and be trained to recognize and avoid the electrical hazards that might be present with respect to that equipment or work method.
         (A) They shall also be familiar with the proper use of the special precautionary techniques, personal protective equipment, including arc-flash, insulating and shielding materials, and insulated tools and test equipment.
         (B) A person can be considered qualified with respect to certain equipment and methods but still are unqualified for others.

(C) Workers permitted to work within the Limited Approach Boundary of exposed energized electrical conductors and circuit parts operating at 50 volts or more shall, at a minimum, be additionally trained in all of the following:

(1) The skills and techniques necessary to distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment

(2) The skills and techniques necessary to determine the nominal voltage of exposed energized electrical conductors and circuit parts

(3) The approach distances specified in Table 6

(4) The decision-making process necessary to determine the degree and extent of the hazard

(5) The personal protective equipment and job planning necessary to perform the task safely

(D) An employee, who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person shall be considered to be a qualified person for the performance of those duties.

(E) Tasks that are performed less often than once per year shall require retraining before the performance of the work practices involved.

(F) Employees shall be trained to select an appropriate voltage detector and shall

(1) demonstrate how to use a device to verify the absence of voltage, including interpreting indications provided by the device.

(2) understand all limitations of each specific voltage detector that may be used.

ii. Unqualified Persons.

(A) Unqualified persons shall be trained in and be familiar with any of the electrical safety related practices that are necessary for their safety.

iii. Retraining.

(A) An employee shall receive additional training (or retraining) under any of the following conditions:

(1) If the supervision or annual inspections indicate that the employee is not complying with the safety-related work practices

(2) If new technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different from those that the employee would normally use

(3) If the employee must use safety-related work practices that are not normally used during his or her regular job duties

d. **Training Documentation.**

i. The employer shall document that each employee has received the required training when the employee demonstrates proficiency in the work practices involved

(A) Shall be maintained for the duration of the employee's employment.

(B) Shall contain each employee's name and the dates of the training.

3. **Electrical Safety Program.**

a. **Procedures.**

i. The procedures for working within the Limited Approach Boundary of energized electrical conductors and circuit parts operating at 50 volts or more or where an electrical hazard exists shall be identified before work is started.

ii. Hazard/Risk Evaluation Procedure.

(A) The hazard/risk evaluation procedure shall be determined prior to work starting within the Limited Approach Boundary when energized electrical conductors and circuit parts are operating at 50 volts or more.

(B) The procedure shall identify the hazard/risk process that shall be used by employees to evaluate tasks before work is started.

b. **Pre-job briefing.**

i. Before starting each job, the employee in charge shall conduct a job briefing with the employees involved.

ii. The briefing shall cover such subjects as hazards associated with the job, work procedures involved, special precautions, energy source controls, and personal protective equipment requirements.

iii. If the work or operations to be performed during the work day or shift are repetitive and similar, at least one job briefing shall be conducted before the start of the first job of the day or shift.

iv. Additional job briefings shall be held if changes that might affect the safety of employees occur during the course of the work.

v. If the work involved is routine, a brief discussion shall be reasonably expected to accomplish the briefing for hazard recognition and avoidance

vi. A more extensive discussion shall be conducted if either of the following apply:

(A) The work is complicated or particularly hazardous.

(B) The employee cannot be expected to recognize and avoid the hazards involved in the job.

4. **Other Precautions for Personnel Activities**

a. Alertness

i. Employees shall be alert at all times when they are working within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more and in work situations where electrical hazards might exist.

ii. Employees shall not be permitted to work within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more, or where other electrical hazards exist, while their alertness is recognizably impaired due to illness, fatigue, or other reasons.

iii. Employees shall be instructed to be alert for changes in the job or task that may lead the person outside of the electrically safe work condition or expose the person to additional hazards that were not part of the original plan.

b. Blind Reaches

i. Employees shall be instructed not to reach blindly into areas that might contain exposed energized electrical conductors or circuit parts where an electrical hazard exists.

c. Illumination

i. Employees shall not enter spaces containing electrical hazards unless illumination is provided that enables the employees to perform the work safely.

ii. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

d. Conductive Articles and Materials

i. Conductive articles of jewelry and clothing shall not be worn where they present an electrical contact hazard with exposed energized electrical conductors or circuit parts. Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that prevents accidental contact with energized electrical conductors or circuit parts.

(A) Such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses

(B) Such materials and equipment include, but are not limited to, long conductive objects, such as ducts, pipes and tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, bull floats, and chains.

5. **Working While Exposed to Electrical Hazards.**

a. **General.**

i. Safety-related work practices shall be used to safeguard employees from injury while they are exposed to electrical hazards from electrical conductors or circuit parts that are or can become energized.

ii. The specific safety-related work practices shall be consistent with the nature and extent of the associated electrical hazards.

b. **Energized Electrical Conductors and Circuit Parts — Safe Work Condition.**

i. Energized electrical conductors and circuit parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works within the Limited Approach Boundary of those conductors or parts.

c. **Energized Electrical Conductors and Circuit Parts — Unsafe Work Condition.**

i. Only qualified persons shall be permitted to work on electrical conductors or circuit parts that have not been put into an electrically safe work condition.

d. **Working Within the Limited Approach Boundary of Exposed Electrical Conductors or Circuit Parts that Are or Might Become Energized.**

i. Prior to working within the Limited Approach Boundary of exposed electrical conductors and circuit parts operating at 50 volts or more, lockout/tagout devices shall be applied.

e. **Electrical Hazard Analysis.**

i. If the energized electrical conductors or circuit parts operating at 50 volts or more are not placed in an electrically safe work condition, other safety-related work practices shall be used to protect employees who might be exposed to the electrical hazards involved.

ii. Such work practices shall protect each employee from arc flash and from contact with energized electrical conductors or circuit parts operating at 50 volts or more directly with any part of the body or indirectly through some other conductive object.

iii. Work practices that are used shall be suitable for the conditions under which the work is to be performed and for the voltage level of the energized electrical conductors or circuit parts.

iv. Appropriate safety-related work practices shall be determined before any person is exposed to the electrical hazards involved by using both shock hazard analysis and arc flash hazard analysis.

(A) Shock Hazard Analysis. A shock hazard analysis shall determine the voltage to which personnel will be exposed, boundary requirements, and the personal protective

equipment necessary in order to minimize the possibility of electrical shock to personnel.

(B) Arc Flash Hazard Analysis. An arc flash hazard analysis shall determine the Arc Flash Protection Boundary and the personal protective equipment that people within the Arc Flash Protection Boundary shall use.

f. **Energized Electrical Work Permit.**

i. When working on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition (i.e., for the reasons of increased or additional hazards) work shall be performed by written permit only.

g. **Unqualified Persons.**

i. Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified employees only, unless the electric conductors and equipment are placed in an electrically safe work condition.

h. **Safety Interlocks.**

i. Only qualified persons following the requirements for working inside the Restricted Approach Boundary shall be permitted to defeat or bypass an electrical safety interlock and then only temporarily while the qualified person is working on the equipment.

ii. The safety interlock system shall be returned to its operable condition when the work is completed.

6. **Use of Equipment.**

a. **Test Instruments and Equipment.**

i. Rating. Test instruments, equipment, and their accessories shall be rated for circuits and equipment to which they will be connected.

ii. Design. Test instruments, equipment, and their accessories shall be designed for the environment to which they will be exposed, and for the manner in which they will be used.

iii. Visual Inspection. Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors shall be visually inspected for external defects and damage before each use. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.

iv. Operation Verification. When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

b. **Portable Electric Equipment.**

i. This section applies to the use of cord-and-plug-connected equipment, including cord sets (extension cords).

ii. Handling. Portable equipment shall be handled in a manner that will not cause damage.

(A) Flexible electric cords connected to equipment shall not be used for raising or lowering the equipment.

(B) Flexible cords shall not be fastened with staples or hung in such a fashion as could damage the outer jacket or insulation.

iii. Grounding-Type Equipment.

(A) A flexible cord used with grounding-type utilization equipment shall contain an equipment grounding conductor.

(B) Attachment plugs and receptacles shall not be connected or altered in a manner that would interrupt continuity of the equipment grounding conductor. Additionally, these devices shall not be altered in order to allow use in a manner that was not intended by the manufacturer.

(C) Adapters that interrupt the continuity of the equipment grounding conductor shall not be used.

iv. Visual Inspection of Portable Cord-and-Plug- Connected Equipment and Flexible Cord Sets.

(A) Frequency of Inspection. Before each use, portable cord-and-plug-connected equipment shall be visually inspected for external defects (such as loose parts or deformed and missing pins) and for evidence of possible internal damage (such as a pinched or crushed outer jacket).

(B) Defective Equipment. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item shall be removed from service, and no employee shall use it until repairs and tests necessary to render the equipment safe have been made.

(C) Proper Mating. When an attachment plug is to be connected to a receptacle, the relationship of the plug and receptacle contacts shall first be checked to ensure that they are of mating configurations.

(D) Conductive Work Locations. Portable electric equipment used in highly conductive work locations or in job locations where employees are likely to contact water or conductive liquids shall be approved for those locations.

v. Connecting Attachment Plugs.

(A) Employees' hands shall not be wet when plugging and unplugging flexible cords and cord-and-plug-connected equipment if energized equipment is involved.

(B) Energized plug and receptacle connections shall be handled only with insulating protective equipment if the condition of the connection could provide a conductive path to the employee's hand (if, for example, a cord connector is wet from being immersed in water).

(C) Locking-type connectors shall be secured after connection.

c. **GFCI Protection Devices.**

i. GFCI protection devices are required on all jobs

ii. GFCI protection devices shall be tested

(A) per manufacturer's instructions.

(B) Prior to use

iii. GFCI testing shall be documented at least monthly

d. **Overcurrent Protection Modification.**

i. Over current protection of circuits and conductors shall not be modified beyond that permitted by applicable portions of electrical codes and standards dealing with overcurrent protection.

7. **Achieving an Electrically Safe Work Condition.**

a. **An electrically safe work condition shall be achieved when LOTO has been performed and verified by the following process:**

i. Use an adequately rated voltage detector to test each phase conductor or circuit part to verify they are de-energized. Test each phase conductor or circuit part both phase-to-phase and phase-to-ground. Before and after each test, determine that the voltage detector is operating satisfactorily.

ii. Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts before touching them. Where it could be reasonably anticipated that the conductors or circuit parts being de-energized could contact other exposed energized conductors or circuit parts, apply ground connecting devices rated for the available fault duty.

8. **Justification for Work.**

a. **General.** Energized electrical conductors and circuit parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works within the Limited Approach Boundary of those conductors or parts, except:

i. Greater Hazard. Energized work shall be permitted where the employer can demonstrate that de-energizing introduces additional or increased hazards.

ii. Infeasibility. Energized work shall be permitted where the employer can demonstrate that the task to be performed is infeasible in a de-energized state due to equipment design or operational limitations.

iii. Less Than 50 Volts. Energized electrical conductors and circuit parts that operate at less than 50 volts to ground shall not be required to be de-energized where the capacity of the source and any over-current protection between the energy source and the worker are considered and it is determined that there will be no increased exposure to electrical burns or to explosion due to electric arcs.

b. **Energized Electrical Work Permit.**

i. When working on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition, work to be performed shall be considered energized electrical work and shall be performed by written permit only.

ii. Elements of Work Permit. The energized electrical work permit shall include, but not be limited to, the following items:

(A) A description of the circuit and equipment to be worked on and their location

(B) Justification for why the work must be performed in an energized condition

(C) A description of the safe work practices to be employed

(D) Results of the shock hazard analysis

(E) Determination of shock protection boundaries

(F) Results of the arc flash hazard analysis

(G) The arc flash protection boundary

(H) The necessary personal protective equipment to safely perform the assigned task

(I) Means employed to restrict the access of unqualified persons from the work area

(J) Evidence of completion of a job briefing, including a discussion of any job-specific hazards

(K) Energized work approval signature: authorizing or responsible management, safety officer, or owner, etc.

iii. Exemptions to Work Permit.

(A) Work performed within the Limited Approach Boundary of energized electrical conductors or circuit parts by qualified persons related to tasks such as testing, troubleshooting, voltage measuring, etc., shall be permitted to be performed without an energized electrical work permit, provided appropriate safe work practices and personal protective equipment are provided and used.

(B) If the purpose of crossing the Limited Approach Boundary is only for visual inspection and the Restricted Approach Boundary will not be crossed, then an energized electrical work permit shall not be required.

9. **Personal and Other Protective Equipment.**

a. **General.**

i. Employees working in areas where electrical hazards are present shall be provided with, and shall use, protective equipment that is designed and constructed for the specific part of the body to be protected and for the work to be performed.

ii. The PPE requirements are intended to protect a person from arc flash and shock hazards.

(A) Burns to the skin, even with the protection selected, should be reduced and survivable.

(B) Due to the explosive effect of some arc events, physical trauma injuries could occur.

iii. When incident energy exceeds 40 Cal/cm2, greater emphasis may be necessary with respect to de-energizing before working within the Limited Approach Boundary.

b. **Care of Equipment.**

i. Protective equipment shall be maintained in a safe, reliable condition.

(A) The protective equipment shall be visually inspected before each use.

(B) Protective equipment shall be stored in a manner to prevent damage from physically damaging conditions and from moisture, dust, or other deteriorating agents.

ii. Maintenance and Use.

(A) Electrical and personal protective equipment (such as the following) shall be maintained in a safe and reliable working condition.

(1) Grounding equipment
(2) Hot sticks
(3) Rubber gloves, sleeves, and leather protectors
(4) Voltage test indicators
(5) Blanket and similar insulating equipment
(6) Insulating mats and similar insulating equipment
(7) Protective barriers
(8) External circuit breaker rack-out devices
(9) Portable lighting units
(10) Safety grounding equipment
(11) Dielectric footwear
(12) Protective clothing
(13) Bypass jumpers

(B) Insulated and insulating hand tools

(1) Insulating equipment shall be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage.

(C) Insulating gloves shall be given an air test, along with the inspection.

(1) Electrical protective equipment shall be subjected to periodic electrical tests. Test voltages and maximum intervals between tests shall be in accordance with Table 4.

(D) Inspection and Testing of Protective Equipment and Protective Tools.

(1) Visual.

(a) Safety and protective equipment and protective tools shall be visually inspected for damage and defects before initial use and

(b) at intervals thereafter, as service conditions require, but in no case shall the interval exceed 1 year

(2) Testing.

(a) The insulation of protective equipment and protective tools, such as items (i) through (xiii) shall be verified by the appropriate test and visual inspection to ascertain that insulating capability has been retained before initial use, and at intervals thereafter, as service conditions and applicable standards and instructions require,

c. **Personal Protective Equipment.**

i. General.

(A) When an employee is working within the Arc Flash Protection Boundary he or she shall wear protective clothing and other personal protective equipment.

(B) All parts of the body inside the Arc Flash Protection Boundary shall be protected.

ii. Selection of Personal Protective Equipment When Required for Various Tasks.

(A) Where selected in lieu of the incident energy analysis Table 3 shall be used to determine the hazard/risk category and requirements for use of rubber insulating gloves and insulated and insulating hand tools for a task.

(B) The assumed short-circuit current maximum capacities and maximum fault clearing times for various tasks are listed in the notes to Table 3.

(C) For tasks not listed, or for power systems with greater than the assumed maximum short circuit current capacity or with longer than the assumed maximum fault clearing times, an arc flash hazard analysis shall be required.

iii. Movement and Visibility.

(A) When flame-resistant (FR) clothing is worn to protect an employee, it shall cover all ignitable clothing and shall allow for movement and visibility.

iv. Head, Face, Neck, and Chin (Head Area) Protection.

(A) Employees shall wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with energized electrical conductors or circuit parts or from flying objects resulting from electrical explosion.

(B) Employees shall wear nonconductive protective equipment for the face, neck, and chin whenever there is a danger of injury from exposure to electric arcs or flashes or from flying objects resulting from electrical explosion.

(C) If employees use hairnets and/or beard nets, these items must be non-melting and flame resistant.

v. Eye Protection.

(A) Employees shall wear protective equipment for the eyes whenever there is danger of injury from electric arcs, flashes, or from flying objects resulting from electrical explosion.

vi. Body Protection.

(A) Employees shall wear FR clothing wherever there is possible exposure to an electric arc flash above the threshold incident-energy level for a second degree burn (1.2 Cal/cm2).

(B) Such clothing can be provided as an arc flash suit jacket and arc flash suit pants, shirts and pants, or as coveralls, or as a combination of jacket and pants, or, for increased protection, as coveralls with jacket and pants.

(C) Various weight fabrics are available. Generally, the higher degree of protection is provided by heavier weight fabrics and/or by layering combinations of one or more layers of FR clothing. In some cases, one or more layers of FR

vii. Hand and Arm Protection.

(A) Hand and arm protection shall be provided in accordance with (i), (ii), and (iii) below.

(1) Shock Protection.

(a) Employees shall wear rubber insulating gloves with leather protectors where there is a danger of hand injury from electric shock due to contact with energized electrical conductors or circuit parts. Employees shall wear rubber insulating gloves with leather protectors and rubber insulating sleeves where there is a danger of hand and arm injury from electric shock due to contact with energized electrical conductors or circuit parts. Rubber insulating gloves shall be rated for the voltage for which the gloves will be exposed.

(b) *Exception: Where it is necessary to use rubber insulating gloves without leather protectors, the requirements of ASTM F 496, Standard Specification for In-*Service Care of Insulating Gloves and Sleeves, shall be met.

viii. Foot Protection.

(A) Where insulated footwear is used as protection against step and touch potential, dielectric overshoes shall be required.

(B) Insulated soles shall not be used as primary electrical protection.

ix. Arc Flash Protection.

(A) Hand and arm protection shall be worn where there is possible exposure to arc flash burn.

(B) Leather or FR gloves shall be required for protection of hands from burns.

x. Factors in Selection of Protective Clothing.

(A) Protective clothing includes shirts, pants, coveralls, jackets, and parkas worn routinely by workers who, under normal working conditions, are exposed to momentary electric arc and related thermal hazards. Flame-resistant rainwear worn in inclement weather is included in this category of clothing.

(B) Clothing and equipment that provide worker protection from shock and arc flash hazards shall be utilized.

(C) Clothing and equipment required for the degree of exposure shall be permitted to be worn alone or integrated with flammable, non-melting apparel. If FR clothing is required, it shall cover associated parts of the body as well as all flammable apparel while allowing movement and visibility.

(D) All personal protective equipment shall be maintained in a sanitary and functionally effective condition.

(E) Personal protective equipment items will normally be used in conjunction with one another as a system to provide the appropriate level of protection.

(F) Layering.

(1) Non-melting, flammable fiber garments shall be permitted to be used as under-layers in conjunction with FR garments in a layered system for added protection.

(2) If non-melting, flammable fiber garments are used as under-layers, the system arc rating shall be sufficient to prevent break-open of the innermost FR layer at the expected arc exposure incident energy level to prevent ignition of flammable under-layers.

(3) A typical layering system might include cotton underwear, a cotton shirt and trouser, and a FR coverall. Specific tasks might call for additional FR layers to achieve the required protection level.

(4) Outer Layers.

(a) Garments worn as outer layers over FR clothing, such as jackets or rainwear, shall also be made from FR material.

(5) Under-layers.

(a) Fibers such as acetate, nylon, polyester, polypropylene, and spandex which melt shall not be permitted in fabric under-layers (underwear) next to the skin. Exception: An incidental amount of elastic used on non-melting fabric underwear or socks shall be permitted.

(b) FR garments (e.g., shirts, trousers, and coveralls) worn as under-layers that neither ignite nor melt and drip in the course of an exposure to electric arc and related thermal hazards generally provide a higher system arc rating than non-melting, flammable fiber under-layers.

(c) FR underwear or undergarments used as under-layers generally provide a higher system arc rating than non-melting, flammable fiber underwear or undergarments used as under-layers.

(6) Coverage.

(a) Clothing shall cover potentially exposed areas as completely as possible. Shirt sleeves shall be fastened at the wrists, and shirts and jackets shall be closed at the neck.

(7) Fit.

(a) Tight-fitting clothing shall be avoided. Loose-fitting clothing provides additional thermal insulation because of air spaces. FR apparel shall fit properly such that it does not interfere with the work task.

(8) Interference.

(a) The garment selected shall result in the least interference with the task but still provide the necessary protection. The work method, location, and task could influence the protective equipment selected.

d. **Arc Flash Protective Equipment.**

i. Arc Flash Suits.

(A) Arc flash suit design shall permit easy and rapid removal by the wearer. The entire arc flash suit, including the hood's face shield, shall have an arc rating that is suitable for the arc flash exposure.

(B) When exterior air is supplied into the hood, the air hoses and pump housing shall be either covered by FR materials or constructed of non-melting and nonflammable materials.

ii. Face Protection.

(A) Face shields shall have an arc rating suitable for the arc flash exposure.

(B) Face shields without an arc rating shall not be used.

(C) Eye protection (safety glasses or goggles) shall always be worn under face shields or hoods.

(D) Face shields made with energy-absorbing formulations that can provide higher levels of protection from the radiant energy of an arc flash are available, but these shields are tinted and can reduce visual acuity and color perception. Additional illumination of the task area might be necessary when these types of arc-protective face shields are used.

iii. Hand Protection.

(A) Leather or FR gloves shall be worn where required for arc flash protection.

(B) Where insulating rubber gloves are used for shock protection, leather protectors shall be worn over the rubber gloves.

(C) Insulating rubber gloves and gloves made from layers of flame-resistant material provide hand protection against the arc flash hazard.

(D) Heavy-duty leather (e.g., greater than 12 oz./yd2) gloves provide protection suitable up to Hazard/Risk Category 2.

(E) The leather protectors worn over insulating rubber gloves provide additional arc flash protection for the hands. During high arc flash exposures leather can shrink and cause a decrease in protection.

iv. Foot Protection. .

(A) Heavy-duty leather work shoes provide some arc flash protection to the feet and shall be used in all tasks in Hazard/Risk Category 2

v. Clothing Material Characteristics.

(A) Clothing made from flammable synthetic materials that melt at temperatures below 600°F, such as acetate, acrylic, nylon, polyester, polyethylene, polypropylene, and spandex, either alone or in blends, shall not be used.

(B) Clothing and other apparel (such as hard hat liners and hair nets) made from materials that do not meet the melting or flammability requirements shall not be permitted to be worn.

(C) Some flame-resistant fabrics, such nondurable flame-retardant treatments of cotton, are not recommended for industrial electrical or utility applications.

e. **Other Protective Equipment.**

i. Insulated Tools and Equipment.

(A) Employees shall use insulated tools and/or handling equipment when working inside the Limited Approach Boundary of exposed energized electrical conductors or circuit parts where tools or handling equipment might make accidental contact.

(B) Table 3 provides further information for tasks that require insulated and insulating hand tools.

(C) Insulated tools shall be protected from damage to the insulating material.

ii. Requirements for Insulated Tools.

(A) The following requirements shall apply to insulated tools:
(1) Insulated tools shall be rated for the voltages on which they are used.
(2) Insulated tools shall be designed and constructed for the environment to which they are exposed and the manner in which they are used.
(3) Insulated tools and equipment shall be inspected prior to each use.
(a) The inspection shall look for damage to the insulation or damage that may limit the tool from performing its intended function or could increase the potential for an incident (e.g., damaged tip on a screwdriver).

iii. Fuse or Fuse Holding Equipment.
(A) Fuse or fuse holder handling equipment, insulated for the circuit voltage, shall be used to remove or install a fuse if the fuse terminals are energized.

iv. Ropes and Hand lines.
(A) Ropes and hand lines used within the Limited Approach Boundary of exposed energized electrical conductors or circuit parts operating at 50 volts or more, or used where an electrical hazard exists, shall be nonconductive.

v. Fiberglass-Reinforced Plastic Rods.
(A) Fiberglass reinforced plastic rod and tube used for live line tools shall meet the requirements of applicable portions of electrical codes and standards dealing with electrical installation requirements.

vi. Portable Ladders.
(A) Portable ladders shall have nonconductive side rails if they are used where the employee or ladder could contact exposed energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists. Nonconductive ladders shall meet the requirements of ANSI standards for ladders listed in Table 5.

vii. Protective Shields.
(A) Protective shields, protective barriers, or insulating materials shall be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working within the Limited Approach Boundary of energized conductors or circuit parts that might be accidentally contacted or where dangerous electric heating or arcing might occur.
(B) When normally enclosed energized conductors or circuit parts are exposed for maintenance or repair, they shall be guarded to protect unqualified persons from contact with the energized conductors or circuit parts.

viii. Rubber Insulating Equipment.
(A) Rubber insulating equipment used for protection from accidental contact with energized conductors or circuit parts shall meet the requirements of the ASTM standards listed in Table 5.

ix. Voltage-Rated Plastic Guard Equipment.
(A) Plastic guard equipment for protection of employees from accidental contact with energized conductors or circuit parts, or for protection of employees or energized equipment or material from contact with ground, shall meet the requirements of the ASTM standards listed in Table 5.

x. Physical or Mechanical Barriers.

(A) Physical or mechanical (field-fabricated) barriers shall be installed no closer than the Restricted Approach Boundary distance given in Table 6.

(B) While the barrier is being installed, the Restricted Approach Boundary distance specified in Table 6 shall be maintained, or the energized conductors or circuit parts

10. **Alerting Techniques.**

a. Safety Signs and Tags.

i. Safety signs, safety symbols, or accident prevention tags shall be used where necessary to warn employees about electrical hazards that might endanger them.

b. Barricades.

i. Barricades shall be used in conjunction with safety signs where it is necessary to prevent or limit employee access to work areas containing energized conductors or circuit parts.

ii. Conductive barricades shall not be used where it might cause an electrical hazard.

iii. Barricades shall be placed no closer than the Limited Approach Boundary given in Table 6.

c. Attendants.

i. If signs and barricades do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect employees.

ii. The primary duty and responsibility of an attendant providing manual signaling and alerting shall be to keep unqualified employees outside a work area where the unqualified employee might be exposed to electrical hazards.

iii. An attendant shall remain in the area as long as there is a potential for employees to be exposed to the electrical hazards.

d. Look-Alike Equipment.

i. Where work performed on equipment that is de-energized and placed in an electrically safe condition exists in a work area with other energized equipment that is similar in size, shape, and construction, identification shall be provided to prevent the worker from entering look-a-like equipment

Table S- 1 Protective Clothing and Personal Protective Equipment

Hazard/Risk Category	Protective Clothing and PPE
Hazard/Risk Category 0 Protective Clothing, Non-melting (according to ASTM F 1506-00) or Untreated Natural Fiber	• Shirt (long sleeve) • Pants (long)
FR Protective Equipment	• Safety glasses or safety goggles (SR) • Hearing protection (ear canal inserts) • Leather gloves (AN) (Note 2)
Hazard/Risk Category 1 FR Clothing, Minimum Arc Rating of 4 (Note 1)	• Arc-rated long-sleeve shirt (Note 3) • Arc-rated pants (Note 3) • Arc-rated coverall (Note 4) • Arc-rated face shield or arc flash suit hood (Note 7) • Arc-rated jacket, parka, or rainwear (AN)
FR Protective Equipment	• Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather gloves (Note 2) Leather work shoes (AN)

Hazard/Risk Category 2 FR Clothing, Minimum Arc Rating of 8 (Note 1)	• Arc-rated long-sleeve shirt (Note 5) • Arc-rated pants (Note 5) • Arc-rated coverall (Note 6) • Arc-rated face shield or arc flash suit hood (Note 7) • Arc rated jacket, parka, or rainwear (AN)
FR Protective Equipment	• Hard hat • Safety glasses or safety goggles (SR) • Hearing protection (ear canal inserts) • Leather gloves (Note 2) • Leather work shoes
Hazard/Risk Category 2* FR Clothing, Minimum Arc Rating of 8 (Note 1)	• Arc-rated long-sleeve shirt (Note 5) • Arc-rated pants (Note 5) • Arc-rated coverall (Note 6) • Arc-rated arc flash suit hood (Note 10) • Arc-rated jacket, parka, or rainwear (AN)
FR Protective Equipment	• Hard hat • Safety glasses or safety goggles (SR) • Hearing protection (ear canal inserts) • Leather gloves (Note 2) • Leather work shoes
Hazard/Risk Category 3 FR Clothing, Minimum Arc Rating of 25 (Note 1)	• Arc-rated long-sleeve shirt (AR) (Note 8) • Arc-rated pants (AR) (Note 8) Arc-rated coverall (AR) (Note 8) • Arc-rated arc flash suit jacket (AR) (Note 8) • Arc-rated arc flash suit pants (AR) (Note 8) • Arc-rated arc flash suit hood (Note 8) • Arc-rated jacket, parka, or rainwear (AN)
FR Protective Equipment	• Hard hat FR hard hat liner (AR) Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Arc-rated gloves (Note 2) Leather work shoes
Hazard/Risk Category 4 FR Clothing, Minimum Arc Rating of 40 (Note 1)	• Arc-rated long-sleeve shirt (AR) (Note 9) • Arc-rated pants (AR) (Note 9) • Arc-rated coverall (AR) (Note 9) • Arc-rated arc flash suit jacket (AR) (Note 9) • Arc-rated arc flash suit pants (AR) (Note 9) • Arc-rated arc flash suit hood (Note 9) • Arc-rated jacket, parka, or rainwear (AN)
FR Protective Equipment	• Hard hat FR hard hat liner (AR) • Safety glasses or safety goggles (SR) • Hearing protection (ear canal inserts) • Arc-rated gloves (Note 2) • Leather work shoes

AN = As Needed **AR** = As Required **SR** = Selection Required

Notes:

1. See Table 2, Arc rating for a garment or system of garments is expressed in Cal/cm2
2. If rubber insulating gloves with leather protectors are required by Table 3, additional leather or arc-rated gloves

are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

3. The FR shirt and pants used for Hazard/ Risk Category 1 shall have a minimum arc rating of 4.
4. Alternate is to use FR coveralls (minimum arc rating of 4) instead of FR shirt and FR pants.
5. FR shirt and FR pants used for Hazard/ Risk Category 2 shall have a minimum arc rating of 8.
6. Alternate is to use FR coveralls (minimum arc rating of 8) instead of FR shirt and FR pants.
7. A face shield with a minimum arc rating of 4 for Hazard/Risk Category 1 or a minimum arc rating of 8 for Hazard/Risk Category 2, with wrap-around guarding to protect not only the face, but also the forehead, ears, and neck (or, alternatively, an arc-rated arc flash suit hood), is required.
8. An alternate is to use a total FR clothing system and hood, which shall have a minimum arc rating of 25 for Hazard/Risk Category 3
9. The total clothing system consisting of FR shirt and pants and/or FR coveralls and/or arc flash coat and pants and hood shall have a minimum arc rating of 40 for Hazard/Risk Category 4.
10. Alternate is to use a face shield with a minimum arc rating of 8 and a balaclava (sock hood) with a minimum arc rating of 8 and which covers the face, head and neck except for the eye and nose areas.

Table S- 2 Protective Clothing Characteristics

Hazard / Risk Category	Clothing Description	Required Minimum Arc Rating of PPE	
		J/cm^2	Cal/cm^2
0	Non-melting, flammable materials (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials) with a fabric weight at least 4.5 oz./yd2	N/A	N/A
1	Arc-rated FR shirt and FR pants or FR coverall	16.74	4
2	Arc-rated FR shirt and FR pants or FR coverall	33.47	8
3	Arc-rated FR shirt and pants or FR coverall, and arc flash suit selected so that the system arc rating meets the required minimum	104.6	25
4	Arc-rated FR shirt and pants or FR coverall, and arc flash suit selected so that the system arc rating meets the required minimum	167.36	40

Note: Arc rating can be either ATPV or EBT.

ATPV is defined in ASTM F 1959, Standard Test Method for Determining the Arc Thermal Performance Value of Materials for Clothing, as the incident energy on a material or a multilayer system of materials that results in a 50% probability that sufficient heat transfer through the tested specimen is predicted to cause the onset of a second-degree skin burn injury based on the Stoll curve, Cal/cm2.

EBT is defined in ASTM F 1959 as the incident energy on a material or material system that results in a 50% probability of break-open. ***Arc rating is reported as either ATPV or EBT, whichever is the lower value.***

Table S- 3 Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools			
Tasks Performed on Energized Equipment	**Hazard / Risk Category**	**Rubber Insulating Gloves**	**Insulated & Insulating Hand Tools**
Panel boards or Other Equipment Rated 240 V and Below — Note 1			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	0	N	N
Circuit breaker (CB) or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	0	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	1	Y	Y
Remove/install CBs or fused switches	1	Y	Y
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	1	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	0	N	N
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the panel board	1	Y	Y
Panel boards or Switchboards Rated >240 V and up to 600V (with molded case or insulated case circuit breakers) - Note 1			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	1	N	N
CB or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	1	Y	N
Work on energized electrical conductors and circuit parts, including voltage testing including voltage testing	2*	Y	Y
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the panel board or switchboard	2*	Y	Y
600 V Class Motor Control Centers (MCCs) — Note 2 (except as indicated)			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	1	N	N
CB or fused switch or starter operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch or starter operation with enclosure doors open	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2*	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	0	Y	Y

Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	2*	Y	Y
Insertion or removal of individual starter "buckets" from MCC — Note 3	4	Y	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts) — Note 3	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts) — Note 3	1	N	N
Work on energized electrical conductors and circuit parts of utilization equipment fed directly by a branch circuit of the motor control center	2*	Y	Y
600 V Class Switchgear (with power circuit breakers or fused switches) — Note 4			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	2	N	N
CB or fused switch operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch operation with enclosure doors open	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2*	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	2*	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open or closed	4	N	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	2	N	N
Other 600 V Class (277 V through 600 V, nominal) Equipment — Note 2 (except as indicated) Lighting or small power transformers (600 V, maximum)			
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	2*	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2*	Y	Y
Application of safety grounds, after voltage test	2*	Y	N
Revenue meters (kW-hour, at primary voltage and current) Insertion or removal	2*	Y	N
Cable trough or tray cover removal or installation	1	N	N
Miscellaneous equipment cover removal or installation	1	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	2*	Y	Y
Application of safety grounds, after voltage test	2*	Y	N
Insertion or removal of plug-in devices into or from busways	2*	Y	N

NEMA E2 (fused contactor) Motor Starters, 2.3 kV Through 7.2 kV			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	3	N	N
Contactor operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
Contactor operation with enclosure doors open	2*	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	4	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	3	Y	Y
Insertion or removal (racking) of starters from cubicles, doors open or closed	4	N	N
Application of safety grounds, after voltage test	3	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	3	N	N
Insertion or removal (racking) of starters from cubicles of arc-resistant construction, tested in accordance with IEEE C37.20.7, doors closed only	0	N	N
Metal Clad Switchgear, 1 kV Through 38 kV			
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	3	N	N
CB operation with enclosure doors closed	2	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB operation with enclosure doors open	4	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	4	Y	Y
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	2	Y	Y
Work on control circuits with energized electrical conductors and circuit parts >120 V, exposed	4	Y	Y
Insertion or removal (racking) of CBs from cubicles, doors open or closed	4	N	N
Application of safety grounds, after voltage test	4	Y	N
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	3	N	N
Opening voltage transformer or control power transformer compartments	4	N	N
Arc-Resistant Switchgear Type 1 or 2 (for clearing times of <0.5 sec with a perspective fault current not to exceed the arc resistant rating of the equipment)			
CB operation with enclosure door closed	0	N	N
Insertion or removal (racking) of CBs from cubicles, doors	0	N	N

closed			
Insertion or removal of CBs from cubicles with door open	4	N	N
Work on control circuits with energized electrical conductors and circuit parts 120 V or below, exposed	2	Y	Y
Insertion or removal (racking) of ground and test device with door closed	0	N	N
Insertion or removal (racking) of voltage transformers on or off the bus door closed	0	N	N
Other Equipment 1 kV Through 38 kV Metal-enclosed interrupter switchgear, fused or unfused			
Switch operation of arc-resistant-type construction, tested in accordance with IEEE C37.20.7, doors closed only	0	N	N
Switch operation, doors closed	2	N	N
Work on energized electrical conductors and circuit parts, including voltage testing	4	Y	Y
Removal of bolted covers (to expose bare, energized electrical conductors and circuit parts)	4	N	N
Opening hinged covers (to expose bare, energized electrical conductors and circuit parts)	3	N	N
Outdoor disconnect switch operation (hook stick operated)	3	Y	Y
Outdoor disconnect switch operation (gang-operated, from grade)	2	Y	N
Insulated cable examination, in manhole or other confined space	4	Y	N
Insulated cable examination, in open area	2	Y	N

General Notes (applicable to the entire table):

(a) Rubber insulating gloves are gloves rated for the maximum line-to-line voltage upon which work will be done

(b) Insulated and insulating hand tools are tools rated and tested for the maximum line-to-line voltage upon which work will be done, and are manufactured and tested in accordance with ASTM F 1505, *Standard Specification for Insulated and Insulating Hand Tools*

(c) Y = yes (required),N=no (not required).

(d) For systems rated less than 1000 volts, the fault currents and upstream protective device clearing times are based on an 18" working distance

(e) For systems rated 1 kV and greater, the Hazard/Risk Categories are based on a 36 in. working distance.

(f) For equipment protected by upstream current limiting fuses with arcing fault current in their current limiting range (1/2 cycle fault clearing time or less), the hazard/risk category may be reduced by one number

Specific Notes (as referenced in the table):

1. Maximum of 25 kA short circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time.
2. Maximum of 65 kA short circuit current available; maximum of 0.03 sec (2 cycles) fault clearing time.
3. Maximum of 42 kA short circuit current available; maximum of 0.33 sec (20 cycles) fault clearing time.
4. Maximum of 35 kA short circuit current available; maximum of up to 0.5 sec (30 cycle) fault clearing time

Table S- 4 Rubber Insulating Equipment, Maximum Test Intervals

Rubber Insulating Equipment	When to Test	Governing Standard* for Test Voltage
Blankets	Before first issue; every 12 months thereafter†	ASTM F 479
Covers	If insulating value is suspect	ASTM F 478

Gloves	Before first issue; every 6 months thereafter†	ASTM F 496
Line hose	If insulating value is suspect	ASTM F 478
Sleeves	Before first issue; every 12 months thereafter	ASTM F 496

Specific Notes (as referenced in the table):

*ASTM F 478, *Standard Specification for In-Service Care of Insulating Line Hose and Covers*; ASTM F 479, *Standard Specification for In-Service Care of Insulating Blankets*; ASTM F 496, *Standard Specification*

†If the insulating equipment has been electrically tested but not issued for service, it may not be placed into service unless it has been electrically tested within the previous 12 months.

Table S- 5 Standards on Other Protective Equipment

Subject	Number and Title
Ladders	ANSI A14.1, *Safety Requirements for Portable Wood Ladders*, 2000 ANSI A14.3, *Safety Requirements for Fixed Ladders*, 2002 ANSI A14.4, *Safety Requirements for Job-Made Ladders*, 2002 ANSI A14.5, *Safety Requirement for Portable Reinforced Plastic Ladders*, 2000
Safety signs and tags	ANSI Z535, *Series of Standards for Safety Signs and Tags*, 2006
Blankets	ASTM D 1048, *Standard Specification for Rubber Insulating Blankets*, 2005
Covers	ASTM D 1049, *Standard Specification for Rubber Covers*, 1998 (R 2002)
Line hoses	ASTM D 1050, *Standard Specification for Rubber Insulating Line Hoses*, 2005
Line hoses and covers	ASTM F 478, *Standard Specification for In-Service Care of Insulating Line Hose and Covers*, 1999 (R 2007)
Blankets	ASTM F 479, *Standard Specification for In-Service Care of Insulating Blankets*, 2006
Fiberglass tools/ladders	ASTM F 711, *Standard Specification for Fiberglass-Reinforced Plastic (FRP) Rod and Tube Used in Line Tools*, 2002 (R 2007)
Plastic guards	ASTM F 712, *Standard Test Methods and Specifications for Electrically Insulating Plastic Guard Equipment for Protection of Workers*, 2006
Temporary grounding	ASTM F 855, *Standard Specification for Temporary Protective Grounds to Be Used on De-energized Electric Power Lines and Equipment*, 2004
Insulated hand tools	ASTM F 1505, *Standard Specification for Insulated and Insulating Hand Tools*, 2007

Table S- 6 Approach Boundaries to Energized Electrical Conductors or Circuit Parts for Shock Protection (All dimensions are distance from energized electrical conductor or circuit part to employee.)				
1	2	3	4	5
		Limited Approach Boundary[1]		
Nominal System Voltage Range, Phase to Phase[2]	Exposed Movable Conductor[3]	Exposed Fixed Circuit Part	Restricted Approach Boundary[1]; Includes Inadvertent Movement Adder	Prohibited Approach Boundary[1]
Less than 50	Not specified	Not specified	Not specified	Not specified
50 to 300	10 ft. 0 in.	3 ft. 6 in.	Avoid contact	Avoid contact
301 to 750	10 ft. 0 in.	3 ft. 6 in.	1 ft. 0 in.	0 ft. 1 in.
751 to 15 kV	10 ft. 0 in.	5 ft. 0 in.	2 ft. 2 in.	0 ft. 7 in.
15.1 kV to 36 kV	10 ft. 0 in.	6 ft. 0 in.	2 ft. 7 in.	0 ft. 10 in.
36.1 kV to 46 kV	10 ft. 0 in.	8 ft. 0 in.	2 ft. 9 in.	1 ft. 5 in.
46.1 kV to 72.5 kV	10 ft. 0 in.	8 ft. 0 in.	3 ft. 3 in.	2 ft. 2 in.
72.6 kV to 121 kV	10 ft. 8 in.	8 ft. 0 in	3 ft. 4 in.	2 ft. 9 in.
138 kV to 145 kV	11 ft. 0 in	10 ft. 0 in.	3 ft. 10 in.	3 ft. 4 in.
161 kV to 169 kV	11 ft. 8 in.	11 ft. 8 in.	4 ft. 3 in.	3 ft. 9 in.
230 kV to 242 kV	13 ft. 0 in.	13 ft. 0 in.	5 ft. 8 in.	5 ft. 2 in.
345 kV to 362 kV	15 ft. 4 in.	15 ft. 4 in.	9 ft. 2 in.	8 ft. 8 in.
500 kV to 550 kV	19 ft. 0 in.	19 ft. 0 in.	11 ft. 10 in.	11 ft. 4 in.
765 kV to 800 kV	23 ft. 9 in.	23 ft. 9 in.	15 ft. 11 in.	15 ft. 5 in.

Note: For Arc Flash Protection Boundary - When an arc flash hazard exists, an approach limit at a distance from a prospective arc source within which a person could receive a second degree burn if an electrical arc flash were to occur.

(1) Voltage Levels Between 50 Volts and 600 Volts. In those cases where detailed arc flash hazard analysis calculations are not performed for systems that are between 50 volts and 600 volts, the Arc Flash Protection Boundary shall be 4.0 ft., based on the product of clearing time of 2 cycles (0.033 sec) and the available bolted fault current of 50 kA or any combination not exceeding 100 kA cycles (1667 ampere seconds). When the product of clearing times and bolted fault current exceeds 100 kA cycles, the Arc Flash Protection Boundary shall be calculated.

(2) Voltage Levels Above 600 Volts. At voltage levels above 600 volts, the Arc Flash Protection Boundary shall be the distance at which the incident energy equals 1.2 Cal/cm^2. For situations where fault-clearing time is equal to or less than 0.1 sec, the Arc Flash Protection Boundary shall be the distance at which the incident energy level equals 1.5 Cal/cm^2.

1 * Limited Approach Boundary -An approach limit at a distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists.

* Restricted Approach Boundary - An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased risk of shock, due to electrical arc over combined with inadvertent movement, for personnel working in close proximity to the energized electrical conductor or circuit part.

* Prohibited Approach Boundary - An approach limit at a distance from an exposed energized electrical conductor or circuit part within which work is considered the same as making contact with the electrical conductor or circuit part.

2 For single-phase systems, select the range that is equal to the system's maximum phase-to-ground voltage multiplied by 1.732.

3 A condition in which the distance between the conductor and a person is not under the control of the person. The term is normally applied to overhead line conductors supported by poles.

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Preparatory Operations

General

Before and demolition occurs elements (a) through (k) shall be evaluated by a competent person. Documentation of this shall be submitted via Burns & McDonnell "Demolition Preparatory Checklist" Safety Form T-1.

T-1

Demolition - Prior to starting demolition operations, a competent person shall determine the possibility of unplanned collapse of any portion of the structure or adjacent structures.

Damaged Structure - When workers are required within a structure which has been damaged, the walls or floor shall be shored or braced.

Utilities - All utilities shall be shut off outside the building line and utility companies shall be notified before demolition work is started.

Temporarily Relocated Utilities - If it is necessary to maintain any utilities during demolition, utilities shall be temporarily relocated, and protected.

Hazardous Chemicals - If the presence of hazardous chemicals is determined the hazard shall be eliminated before demolition is started.

Fragmentation of Glass - Where a hazard exists from fragmentation of glass, such hazards shall be removed.

Wall openings shall be protected with appropriate fall protection.

Floor Openings & Dropped Debris - If debris is dropped through holes in the floor without chutes, the drop area shall be barricaded. Warning signs shall be posted at each level, and removal shall not be permitted in this lower area until debris handling ceases above.

Floor Openings which are not Used As Material Drops - All floor openings, not used as material drops, shall be covered with material that can support the weight of any load which may be imposed and properly secured to prevent its accidental movement.

Begin Structure Demolition - Demolition shall begin at the top of the structure and proceed downward.

Worker entrances shall be protected from falling materials.

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- **Training Personnel**
- **Fall Hazard Training**
- **Special Training Programs**

Site Layout, Site Specific Erection Plan and Construction Sequence

Approval to Begin Steel Erection

Approval to Begin Steel Erection - Before authorizing the commencement of steel erection, the controlling contractor shall ensure that the steel erector has been notified by Burns & McDonnell Safety Form U-1 "Concrete and Anchor Bolt Release " that :

U-1

Any *repairs,* replacements and modifications to the anchor bolts were conducted with the approval of the project structural engineer of record Burns & McDonnell "Discrepancy Report" QF-005.

QF-005

Commencement of Steel Erection

Commencement of Steel Erection - A steel erection contractor shall not erect steel unless it has received written notification by Burns & McDonnell "Approval to Begin Steel Erection" Safety Form U-3.

U-3

Site-Specific Erection Plan

Site-Specific Erection Plan - Burns & McDonnell Safety Form U-2 "Site-Specific Steel Erection Plan" shall be developed by a qualified person and submitted to Burns & McDonnell.

U-2

Hoisting and Rigging

Multiple Lift Rigging Procedure or "Christmas treeing" – may only be performed by permission of the Burns & McDonnell Director of Corporate Health & Safety, and then:

1. A multiple lift shall only be performed if the following criteria are met:
   a. A multiple lift rigging assembly is used;
   b. A maximum of five members are hoisted per lift;
   c. Only beams and similar structural members are lifted; and
   d. All workers engaged in the multiple lift have been trained in these procedures.
   e. No crane is permitted to be used for a multiple lift where such use is contrary to the manufacturer's specifications and limitations.

2. Components of the multiple lift rigging assembly shall be assembled with a maximum capacity for total assembly and each individual attachment point.

3. The total load shall not exceed:

a. The rated capacity of the hoisting equipment specified in the hoisting equipment load charts;
b. The rigging capacity specified in the rigging rating chart.

4. The multiple lift rigging assembly shall be rigged with members:
   a. Attached at their center of gravity and maintained reasonably level;
   b. Rigged from top down; and
   c. Rigged at least 7 feet apart.

5. The members on the multiple lift rigging assembly shall be set from the bottom up.

6. Controlled load lowering shall be used whenever the load is over the connectors.

Structural Steel Assembly

Metal Decking

Covering roof and floor openings

All covers shall be marked with Burns & McDonnell "Hole Cover" Safety Form D-6.

D-6

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Positioning Device Systems
Warning Line Systems
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Covers
Protection from Falling Objects
Fall Protection Plan

General

General

Each worker on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is 6 feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest system.

Personal Fall Arrest Systems

Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two. Documentation of the design, installation and approval process shall be transmitted to Burns& McDonnell refer to Burns & McDonnell Health & Safety Form C-20 "Safety Submittals"

C-20

Inspections of the Horizontal Lifeline shall be documented using the Burns & McDonnell Safety Form V-2 "Fall Protection Equipment Inspection".

V-2

Controlled Access Zones

On floors and roofs where guardrail systems are in place, but need to be removed to allow overhand bricklaying work or leading edge work to take place, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

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Appendix A

Pre-cast Concrete

No worker shall be permitted under pre-cast concrete members.

Appendix B

Lift-Slab Operations

No worker, except those essential to the jacking operation, shall be permitted in the building/structure while any jacking operation is taking place.

Under no circumstances, shall any worker who is not essential to the jacking operation be permitted immediately beneath a slab while it is being lifted.

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Hazard Communication

Hazard Communication Program

The purpose of the Hazard Communication Program (HAZCOM) is to safeguard the health of workers by providing a guide for safe compliance, and information concerning health and physical hazards of the chemical materials in use at the work place.

Burns & McDonnell is committed to performing work in the safest manner possible while providing the safest possible working conditions for all employees. It is the policy of Burns & McDonnell that employees receive training on their company's Hazard Communication Program and agree to abide by all its requirements.

Introduction

Chemicals are often used during project work and some of these chemicals may pose a hazard to health and can cause physical harm if used improperly or carelessly. These chemicals can be used safely with proper knowledge and recognition of the hazards.

While risks of exposure to chemical hazards exist, they can be minimized and controlled. Each potentially exposed employee should have chemical hazard training, and access to HAZCOM information and the material's Safety Data Sheets (SDS).

Burns & McDonnell employee owners should comply with the Burns & McDonnell Hazard Communication Program contained in the Corporate Policy Manual, Chapter 8. All Burns & McDonnell employee owner questions or inquiries regarding the program or chemicals used by company personnel should be directed to the Corporate Health & Safety Department.

The project manager will inform independent contractors who are retained by Burns & McDonnell of the presence of hazardous chemicals known to be in the areas where the contractor will be working. This information will be provided before they begin work.

On projects where multiple employers are contracted by Burns & McDonnell, a master MSDS compilation along with a chemical inventory list (see Burns and McDonnell Chemical Inventory List Safety Form Z-1) for the project shall be kept. The list identifies each chemical or mixture and the conditions in which the chemical or mixture is stored or used. The list is updated as hazardous chemicals or mixtures are removed from or introduced to the project.

At the time of the pre-construction meeting, Subcontractors to Burns & McDonnell are informed that all chemicals and products brought onto the project by the Subcontractor shall have a copy of the SDS submitted to Burns & McDonnell at the time of arrival for that chemical. This responsibility shall be to the Subcontractor to notify Burns & McDonnell. A SDS compilation of all chemicals or products submitted to Burns & McDonnell shall be kept along with a title sheet listing these chemicals. All workers on site shall be made aware of this requirement, the location of the SDS compilation and all workers shall be granted free access to the SDS compilation.

Z-1

Safety Data Sheets (MSDS)

Project management will keep on file a Safety Data Sheet (SDS for each hazardous chemical brought onto the project site.

If workers cannot read English, a special effort will be undertaken to explain the necessary information verbally to them in their language. Bilingual supervision and instructors could be utilized if it is needed.

SDSs will be accessible during normal work hours in the project management trailer/office. Applicable SDSs are also to be maintained and available at each subcontractor's project site office.

Labeling

All containers of hazardous chemicals brought onto the project site are to be labeled. The labels should identify the hazardous chemicals with the appropriate hazard warnings associated with its exposure. The labels shall be in English, legible and prominently displayed on the container. Employees should be careful not to deface or remove warning labels from containers of hazardous chemicals. The labels must remain on the containers and remain legible at all times. Employees who deface hazardous warning labels are subject to disciplinary action.

Burns & McDonnell uses the Hazardous Material Identification System (HMIS) on containers used for storing transferred hazardous chemicals. Burns & McDonnell also uses the HMIS to identify specific hazards in buildings and on projects sites.

In addition, any employee owner transferring a hazardous chemical from a labeled container to an unlabeled container (e.g., a can, bucket or bottle) must affix the appropriate label on the new container. The chemical should never be left unattended in an unlabeled container. Those found will be disposed of properly to avoid potential exposure to an unknown chemical. Chemicals found in unlabeled containers should Not be Used.

Training

All employees who may be potentially exposed to hazardous chemicals under normal operating conditions, while performing non-routine tasks, or under foreseeable emergencies, will receive training on how to safely use any hazardous chemicals present in their work areas.

All new and transferred employees will receive training before performing duties in work areas or on projects where hazardous chemicals are present, whenever a new chemical hazard is introduced into their work area, or when a changed process alters the threat of chemical exposure.

Emergencies

If a chemical emergency occurs, the Emergency Action Plan (refer to Burns & McDonnell Safety Form E1 – EAP and Fire Prevention Plan) will go into effect. Burns & McDonnell will notify all appropriate personnel and contractors, and provide support during the notification of local authorities, evacuation, spill response, clean up and return to operations. The designated person indicated in the Emergency Action Plan is responsible for directing and coordinating all relief efforts.

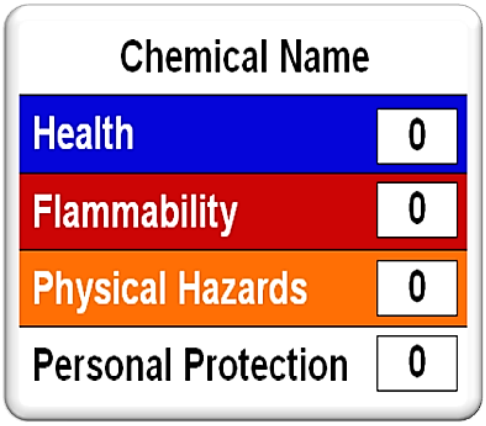
E-1

If an employee comes in contact with a hazardous chemical and needs medical treatment, a copy of the chemical's MSDS should be forwarded to the hospital immediately upon request.

Hazardous Material Identification System (HMIS)

The HMIS (Hazardous Material Identification System) helps satisfy the hazard communication standard (HCS) requirements by providing a format for hazard determinations, offering a basic written hazard communication program, and simplifying the worker training and information process. The HMIS provides clear, recognizable information to workers by standardizing the presentation of chemical information. This is accomplished by the use of color bar system and color codes corresponding to the hazards of a product, assigned numeric ratings indicating the degree of hazard, and alphabetical codes designating appropriate personal protective equipment (PPE) workers should wear while handling the material.

Table Z - 1 HMIS Protective Equipment Examples

		Protective Equipment Examples	
		A	Safety Glasses
		B	Safety Glasses and Gloves
		C	Safety Glasses, Gloves and an Apron
		D	Face Shield, Gloves and an Apron
		E	Safety Glasses, Gloves and a Dust Respirator
		F	Safety Glasses, Gloves, Apron and a Dust Respirator
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		I	Safety Glasses, Gloves and a Dust/Vapor Respirator
		J	Splash Goggles, Gloves, Apron and a Dust/Vapor Respirator
		K	Airline Hood or Mask, Gloves, Full Suit and Boots
L-Z	Custom PPE Specified by Employer	N	Splash Goggles
		O	Face Shield & Eye Protection (Safety glasses)
		P	Gloves
		Q	Boots
		R	Apron
		S	Full Body Suit
		T	Dust Mask
		U	Vapor Respirator (APR)
		W	Combination Dust & Vapor Respirator
		Y	Full Face Respirator
		Z	Airline Hood or Mask (Supplied Air)

This lettering system indicates the level of PPE to be worn to work safely with a material. Each of the individual PPE icons has been designated with a corresponding letter of the alphabet ranging from 'm' through 'z'. An employer can list appropriate letters to customize the PPE required for handling a specific material.

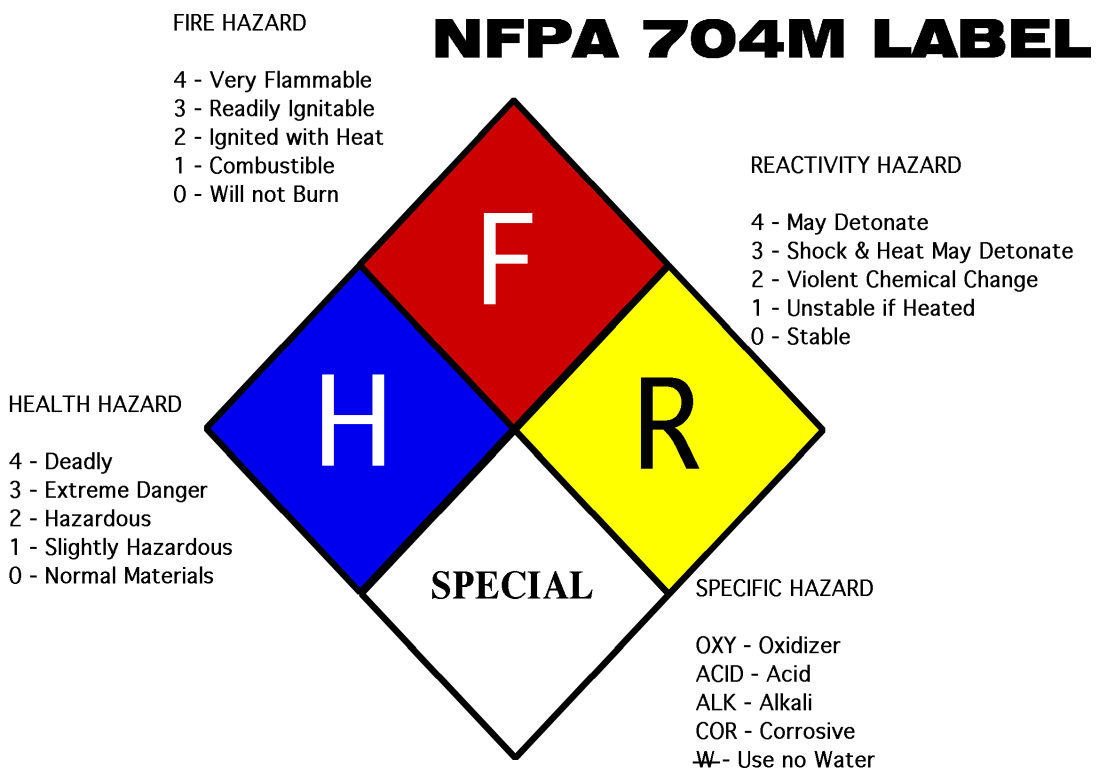
HMIS allows an "" to designate a material as a carcinogen or for materials known to have an adverse effect given chronic exposure. This designation would appear next to the numerical ranking within the blue health bar.*

NFPA 704 Labeling System

The "NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response" is a standard maintained and revised by the National Fire Protection Association. It defines the "fire diamond" used by emergency personnel to quickly and easily identify the risks posed by hazardous materials. This helps determine what, if any, special equipment should be used, procedures followed, or precautions taken during the initial stages of an emergency response.

The four divisions are typically color-coded, with blue indicating level of health hazard, red indicating flammability, yellow (chemical) reactivity, and white containing special codes for unique hazards. Each of health, flammability and reactivity is rated on a scale from 0 (no hazard; normal substance) to 4 (severe risk). See the latest version of NFPA 704 for the specifications of each classification.

Figure Z - 1 NFPA 704 Label



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13,800-Volt and 480-Volt Switchgear

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ATTACHMENT A – Commercial Terms & Conditions

ATTACHMENT B – 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 Powell Electrical Systems, 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, 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

C5310 – 13,800-Volt and 480-Volt Switchgear
Bid #21-14/15

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:

Eight Hundred Fifty-Three Thousand Four Hundred Sixty-Four Dollars and No Cents
($853,464.00)

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

One (1) single-ended lineup of 13.8kV metalclad switchgear	$ 387,498.00
One (1) main-tie-main lineup of 480V metal-enclosed switchgear	$ 394,648.00
Transportation (DDP Project Site, Coffeyville, KS)	$ 4,225.00
Field Services as specified	$ 44,800.00
Performance and Statutory Bonds	$ 5,500.00
One (1) Spare 1200A, 13.8kV breaker	$ 12,025.00
One (1) Spare E3200AF/3200AT, 480V breaker	$ 8,678.00
Deduct for duplicate order	($ 3,910.00)

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 #21-14/15 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:_____

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 the 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 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 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.)

Non-Collusion Affidavit

Coffeyville Municipal Light & Power

STATE OF _____)
) ss
COUNTY OF _____)

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

1. (S)He is the duly authorized agent of _____, 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 Kansas or City of Coffeyville any money or other thing of value, either directly or indirectly, in procuring the Contract to which this statement is attached.

_____
(Company Name)

_____
PRESIDENT

This instrument was subscribed, acknowledged, and sworn to before me this ____day of _____, 20__, by _____, the person signing above, as the above-named Supplier's duly authorized agent.

_____
Notary Public

My Commission Expires:_____
My Commission No.: _____

Non-collusion Affidavit for Payment
for Invoice Payment Over $25,000
Coffeyville Municipal Light & Power

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 Coffeyville Municipal Light & Power 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: _____

Certificate of Non-Discrimination

Coffeyville Municipal Light & Power

In connection with the performance of Work under this Contract, the Supplier agrees as follows:

A. The Supplier agrees not to discriminate against any employee or applicant for employment because of race, creed, color, sex, national origin, ancestry, age or physical disability. The Supplier shall take affirmative action to insure that employees are treated without regard to their race, creed, color, national origin, sex, or ancestry. Such actions shall include, but not be limited to the following: Employment, upgrading, demotion or transfer, recruiting or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training, including apprenticeship. The Supplier and Subcontractor shall agree to post in a conspicuous place, available to employees and applicants for employment, notices to be provided by the Owner setting forth provisions of this section.

B. In the event of the Supplier's non-compliance with this non-discrimination clause, the Contract may be canceled or terminated by the Owner. The Owner may declare the Supplier ineligible for further Contracts with the said agency until satisfactory proof of intent to comply shall be made by the Supplier.

C. The Supplier agrees to include this non-discrimination clause in any Subcontracts connected with the performance of this Agreement.

I have read the above stated clause and agree to abide by its requirements.

_____
(Company Name)

_____
PRESIDENT

(Seal)

_____
Secretary

STATE OF _____)
) ss:
COUNTY OF _____)

On this _____ day of _____, 20__, before me, the undersigned, a Notary Public in and for the County and State aforesaid, personally appeared _____, to me known to be the identical person who signed the name of the maker thereof to the within and foregoing instrument as its _____ and acknowledged to me that ____ executed the same as _____ free and voluntary act and deed, and as the free and voluntary act and deed of said corporation, for the uses and purposes therein set forth.

Given under my hand and seal the day and year last above written.

_____
Notary Public

My Commission Expires:_____
My Commission No.: _____

Business Relationships Affidavit

Coffeyville Municipal Light & Power

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: _____

Attachment A

Commercial Terms and Conditions

ATTACHMENT A

COMMERCIAL TERMS & CONDITIONS

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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; and (b) Owner has formally accepted all the Goods; and (c) Supplier has completed all field service required by the Contract documents.

"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, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the 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 an eighteen (18) month period starting the date on which the Goods are delivered to the Site, or for a twelve (12) month period starting on the Acceptance Date, whichever occurs first.
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.c. below.

Requirement	Liquidated Damages
Late Delivery – Submittals	$500.00/Day per Submittal
Late Delivery - Equipment	$1,000.00/Day

c. Aggregate total for all Liquidated Damages shall be limited to a maximum of four percent (4%) of the Contract Price.
d. For the purposes of calculating Liquidated Damages imposed on Supplier due to Supplier's failure to deliver Submittals noted as "subject to LDs" in the Submittal Schedule, a grace period of seven (7) Days beyond the specified time frame in the Submittal Schedule shall be observed, wherein Liquidated Damages shall not commence to be imposed until expiration of such seven (7) Day grace period.

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
   a. Coincident with the execution of Contract, the Successful Bidder shall furnish good and sufficient Surety company Performance and Statutory Bond.
      i. 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.
      ii. 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.
      iii. 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.
      iv. 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.
      v. 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.

8. TAXES

   The 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. NOT USED

10. TERMINATION
    a. <u>Termination for Cause</u>:
       vi. 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.
       vii. 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.

viii. 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

a. 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:
   i. 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.
   ii. 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.

iii. 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.

iv. 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.

v. 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

vi. 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.

b. 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 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 to the policy limits. The insurance shall include a waiver of subrogation in favor of the additional insured.

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:
   vii. 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);
   viii. price fluctuations with respect to labor or materials, supplies or components of equipment related to items to be supplied by Supplier;
   ix. mere economic hardship; or
   x. 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. Provided; however, Supplier's liability for such consequential, special, or indirect damages shall not exceed an aggregate sum equal to twice (two times) the Contract Price. Furthermore, under no circumstances shall Supplier's overall liability hereunder exceed twice (two times) the price of the Goods or services which give rise to the claim.
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
One (1) 13,800-Volt Metal-clad Switchgear	April 11, 2016	April 18, 2016
One (1) 480-Volt Metal-enclosed Switchgear and bus equipment	April 11, 2016	April 18, 2016
All associated accessories and spare parts per contract.	April 11, 2016	April 18, 2016
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.

EXHIBIT 2 – MILESTONE PAYMENT & CANCELLATION SCHEDULE

Upon meeting or successful completion of the set foreth 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:

30% After submittal of all approval Drawings
40% Upon Release for manufacturing
30% Upon shipment

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 a percentage of the contract value as follows:

20% After order entry
60% After submittal of all approval Drawings
100% After approval of all Drawings

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:_____

Attachment B

Technical Specifications & Drawings

ATTACHMENT B
SPECIFICATIONS & DRAWINGS

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CONTRACT DRAWINGS

Drawing No.	Rev	Drawing Title
EE101	0	One Line Diagram 13,800V Switchgear Metering and Relaying
EE102	0	One Line Diagram 13,800V Switchgear Metering and Relaying
EE103	0	One Line Diagram 13,800V Switchgear Metering and Relaying
EE105	1	One Line Diagram 480V Switchgear 00-EAP-SWG-011 & 00-EAP-SWG-012
SK-LV-F	0	Schematic Diagram 480V Switchgear Typ. Feeder Breaker
SK-LV-E10	0	Schematic Diagram 480V Switchgear Gen. Breaker E10
SK-LV-E1	0	Schematic Diagram 480V Switchgear Main Breaker E1
SK-LV-E2	0	Schematic Diagram 480V Switchgear Main Breaker E2
SK-LV-E3	0	Schematic Diagram 480V Switchgear Main Breaker E3
SK-LV-E4	0	Schematic Diagram 480V Switchgear Tie Breaker E4
SK-LV-FV	0	Front View 480V Switchgear
SK-MV-A-01	0	Schematic Diagram 13.8kV Switchgear Feeder Breaker

CONTRACT DRAWINGS

Drawing No.	Rev	Drawing Title
SK-MV-A-02	0	Schematic Diagram 13.8kV Switchgear Feeder Breaker
SK-MV-A-03	0	Schematic Diagram 13.8kV Switchgear Feeder Breaker
SK-MV-COMM	0	Connection Diagram 13.8kV Switchgear Communications
SK-MV-FV	0	Front View 13.8kV Switchgear
SK-MV-G-01	0	Schematic Diagram 13.8kV Generator Breaker
SK-MV-G-02	1	Schematic Diagram 13.8kV Generator Breaker
SK-MV-G-03	0	Schematic Diagram 13.8kV Generator Breaker
SK-MV-M-01	0	Schematic Diagram 13.8kV Main Breaker
SK-MV-M-02	0	Schematic Diagram 13.8kV Main Breaker
SK-MV-M-03	0	Schematic Diagram 13.8kV Main Breaker

REFERENCE DRAWINGS

Drawing No.	Rev	Drawing Title
E001	0	Electrical Legend for One Line Diagrams
E003	0	Electrical Legend for Connection Diagrams & Schematics

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 Documents.

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. Final net electric power output will be defined in the Agreement.
B. The Project Site is located at 2601 N 5th St, Liberty, Montgomery County, Kansas 67351.
C. Supplier is responsible for final design including Supplier's Equipment arrangement.

1.03 WORK COVERED BY CONTRACT DOCUMENTS:

A. The Contract includes but is not limited to, engineering, designing, fabricating, factory testing, packaging, delivering, and providing field services for the following components of Work, which are listed for the Supplier's convenience in understanding the scope of Work:
   1. One (1) single-ended lineup of 13.8kV metalclad switchgear.
   2. One (1) main-tie-main lineup of 480-V metal-enclosed switchgear.
B. All Work shall be designed to meet the design data specified 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 Project Site.

1.04 WORK BY OTHERS:

A. Electrical connections between switchgear and equipment not furnished under this Contract shall be performed by Others.

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.
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
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
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
AWS	American Welding Society
DIN	German Standard (Deutsche Institute für Normung)
EJMA	Expansion Joint Manufacturer's Association
EN	European Standard
FCI	Fluid Control Institute
HEI	Heat Exchange Institute
IBC	International Building Code 2009
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IES	IES Lighting Handbook
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
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

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
      a. Maximum Dry Bulb — 120°F
      b. Minimum Dry Bulb — 50°F
   3. Outdoor Design Temperatures
      a. Maximum Dry Bulb (1%) — ~~99.2~~97.1°F
      b. Mean Coincident Wet Bulb — ~~75.3~~75.8°F
      c. Minimum Dry Bulb (99.6%) — ~~13.6~~10.3°F
   4. Outdoor Extreme Temperatures (n = 10 years)
      a. Maximum Dry Bulb — ~~110.5~~102.8°F
      b. Minimum Dry Bulb — ~~2.6~~0.6°F
      c. Extreme Max Wet Bulb — ~~88.2~~88.9°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 (I_p = 1.5 under specific conditions, see ASCE 7-05 Section 13.1.3)
      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 = 40mph

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.

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.
   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.
   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.

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
         (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: 81799@burnsmcd.com, with cc: dpetersen@burnsmcd.com and reasterling@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:
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.
   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.
      (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.
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.

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.
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.
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

SECTION 013301 APPENDIX A
Submittal Schedule
Legend: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order or Notice to Proceed

ID	Description	Subject To LD's	With Bid (for bid evaluation and award)	For Acceptance (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 Spare Parts		E		
4	Preliminary Work Progress Schedule				E – 15 Days ARO
5	Schedule of Submittals		E	E – 15 Days ARO	
6	Detailed Manufacturing Schedule with milestones for each piece of Equipment				E – 30 Days ARO
7	Detailed drawing list with submittal dates				E – 30 Days ARO
8	Detailed commissioning work Progress Schedule				E – 60 Days prior to delivery
9	NOT USED				
10	Preliminary O&M Manuals			E – 60 Days prior to earliest Guaranteed Delivery Date	
11	Installation Manuals			E – 60 Days prior to earliest Guaranteed Delivery Date	P (4), E – 30 Days prior to earliest Guaranteed Delivery Date
12	Final O&M Manuals				P (4), E – 30 Days prior to earliest Guaranteed Delivery Date
13	Packing Lists				P (1) – With each shipment
14	Bills of Materials			E – 60-75 Days ARO	
15	Unloading, Handling & Storage Requirements and Procedures				P (1), E – With Notice of Shipment
16	Material Safety Data Sheets (if applicable)				P (4), E – With Notice of Shipment and with each Shipment
17	Switchgear Circuit Breaker and Trip Device Literature and Technical Information		E		
17	Equipment & Component Datasheets			E – 60-75~~30~~ Days ARO	
18	Outline Drawings, Weights, and Front View Drawings	Y	E	E – 30 Days ARO	

Legend: E = Electronic Copy; P(x) = Paper Copy (no. of copies); ARO = After Receipt of Order or Notice to Proceed

ID	Description	Subject To LD's	With Bid (for bid evaluation and award)	For Acceptance (required prior to fabrication)	For Information / Certification / Construction (conformed including Owner's and Engineer's comments)
19	Bus Duct Connection Details			E – 60-75~~30~~ Days ARO	
20	Structural Loadings and Details	Y	E	E – 30 Days ARO	
21	Preliminary One Line Diagrams	Y	E	E – 30 Days ARO	
22	Anchor Bolt and Setting, Assembly, Erection, Section Drawings	Y		E – 30 Days ARO	
23	Arc Flash Duct Drawings	Y		E – 60-75~~30~~ Days ARO	
24	Nameplate Schedule	Y		E – 60-75~~45~~ Days ARO	
24	Bill of Material	Y		E – 60-75~~45~~ Days ARO	
24	Three Line Diagrams	Y		E – 60-75~~45~~ Days ARO	
24	AC/DC Electrical Schematics	Y		E – 60-75~~45~~ Days ARO	
25	Wiring and Interconnection Drawings	Y		E – 60-75~~45~~ Days ARO	
26	CT Saturation Curves	Y		E – 60-75~~45~~ Days ARO	
27	Factory Test Schedule				E– 30 Days prior to test
28	Factory Test Procedure				E–21 Days prior to test
29	Factory Test Report				E – 15 Days after test

APPENDIX B

SUBMITTAL INFORMATION BLOCK

Supplier to fill in all blanks without preprinted information

For the use of Engineer

Project Supplier Identification	**Date Engineer Received**
Supplier: _____ Project Name: _____ Project No.: _____ Contract Title: _____ Contract No.: _____ Spec. Section No.: _____ 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.	**Engineer's Action** (See Contract Documents) Initials & Date **A**_____ **B**_____ **C**_____ **D**_____ Initials & Date **E**_____ **F**_____ **G**_____

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

(Spine)	(Cover)	
13,800-Volt Metalclad Switchgear	**Coffeyville Municipal Light & Power**	36
	Power Generation Station	24
Coffeyville Municipal Light & Power	**INSTRUCTION BOOK**	36
	FOR	36
	13,800-VOLT METALCLAD SWITCHGEAR	36
	VOLUME NUMBER*	36
Power Generation Station	**CONTRACT NUMBER 5310**	24
CONTRACT NUMBER 5310	**SUPPLIER'S NAME**	24
	SUPPLIER 'S ADDRESS	24
	SUPPLIER'S ORDER NUMBER	24
	Equipment Tag Number(s)	24
VOLUME NUMBER*		

(Spine)	(Cover)	
480-Volt Switchgear and Bus Equipment	**Coffeyville Municipal Light & Power**	36
	Power Generation Station	24
Coffeyville Municipal Light & Power	**INSTRUCTION BOOK**	36
	FOR	36
	480-VOLT SWITCHGEAR AND BUS	36
	EQUIPMENT	36
	VOLUME NUMBER*	
Power Generation Station	**CONTRACT NUMBER 5310**	24
CONTRACT NUMBER 5310	**SUPPLIER'S NAME**	24
	SUPPLIER 'S ADDRESS	24
	SUPPLIER'S ORDER NUMBER	24
	Equipment Tag Number(s)	24
VOLUME NUMBER*		

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

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.

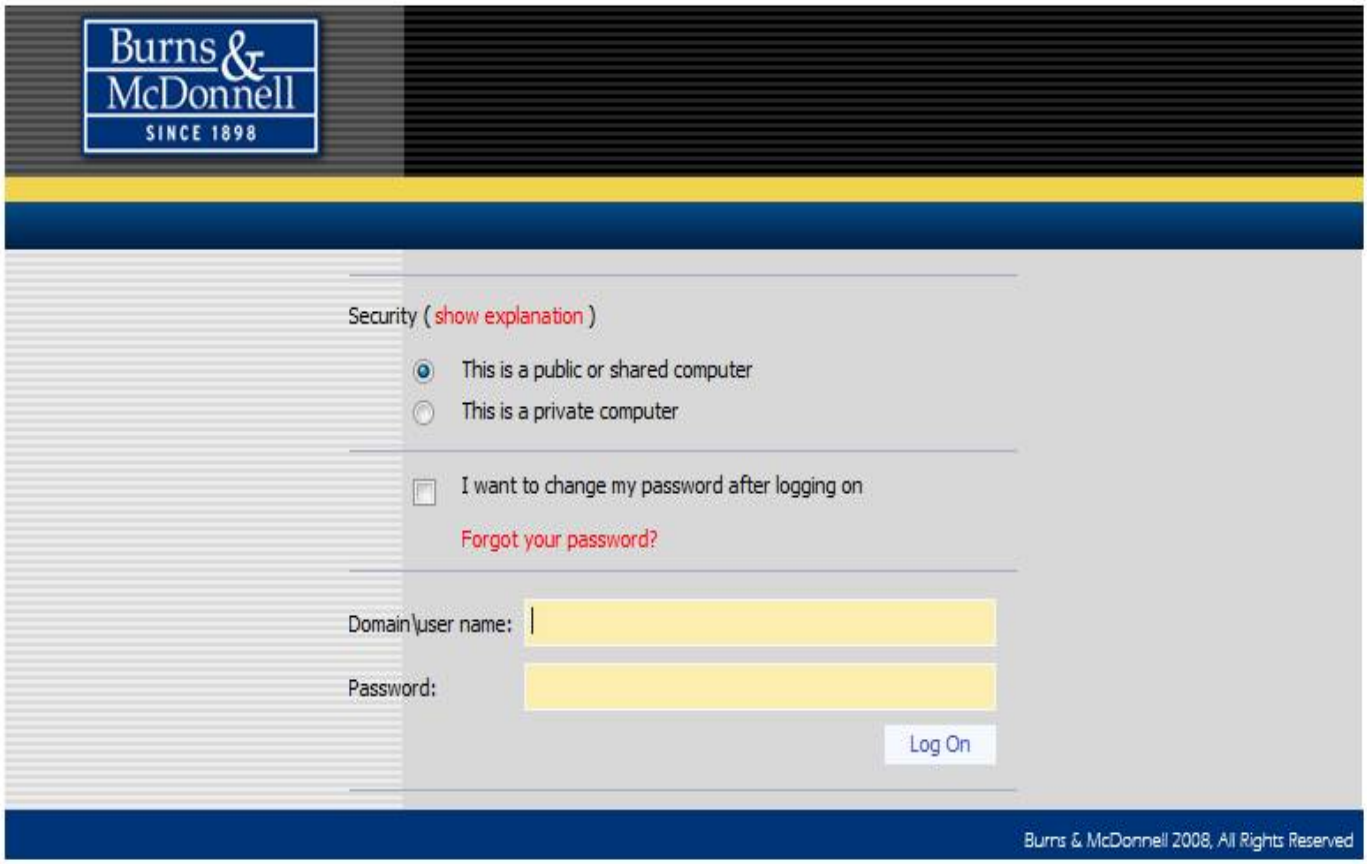
Previously you were not able to change the password you received, but now it can be reset after using the initial password from BMcD. After changing the password it cannot be changed again for 24 hours. Previously used passwords cannot be used again. The Domain is BMCDEXT and should preface your username.

To Login:

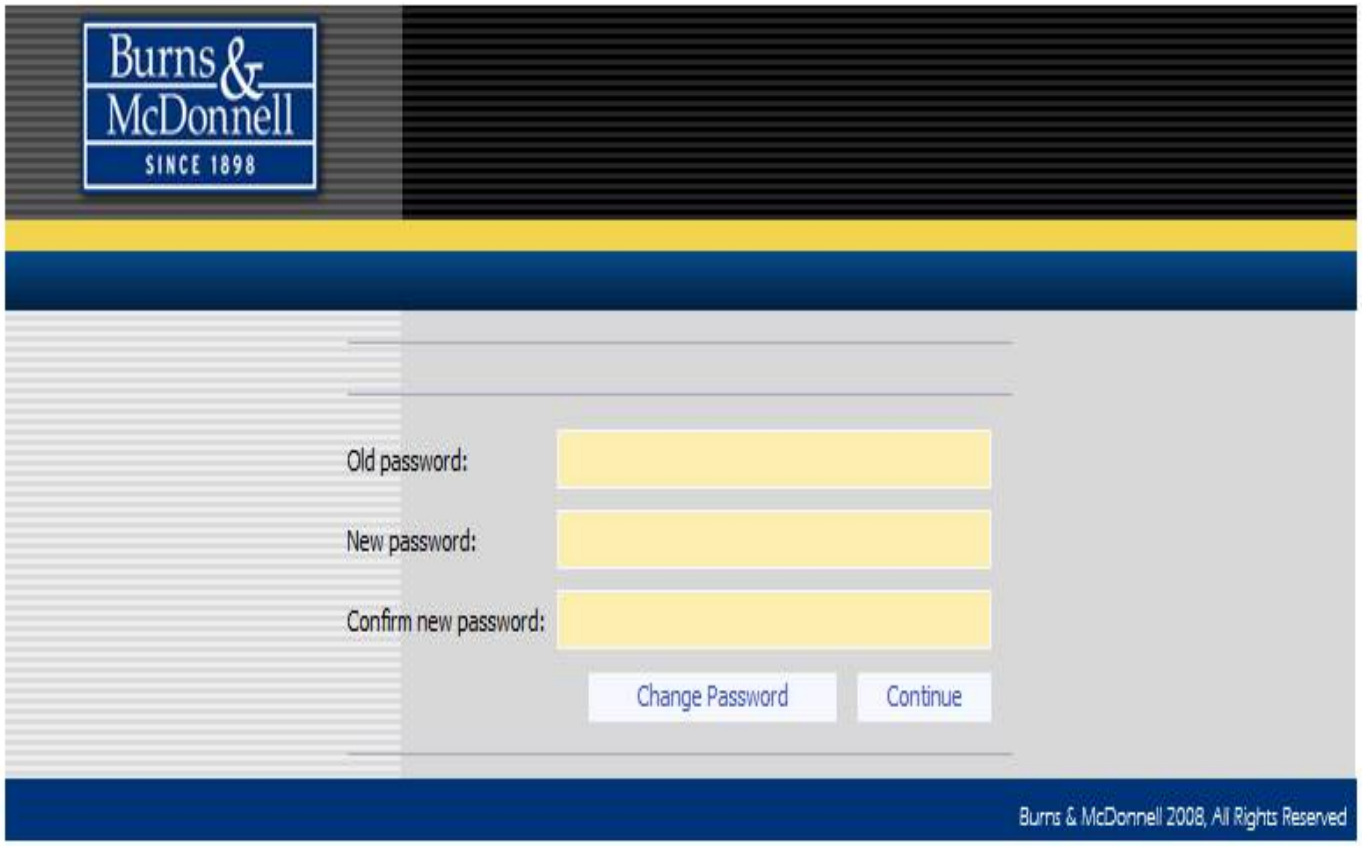
The Domain is BMCDEXTand should be typed in before the user name. **Example: BMcDext\[user ID] so the information would be BMcDEXT\ext_jdoe.**

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?"

Login Screen:



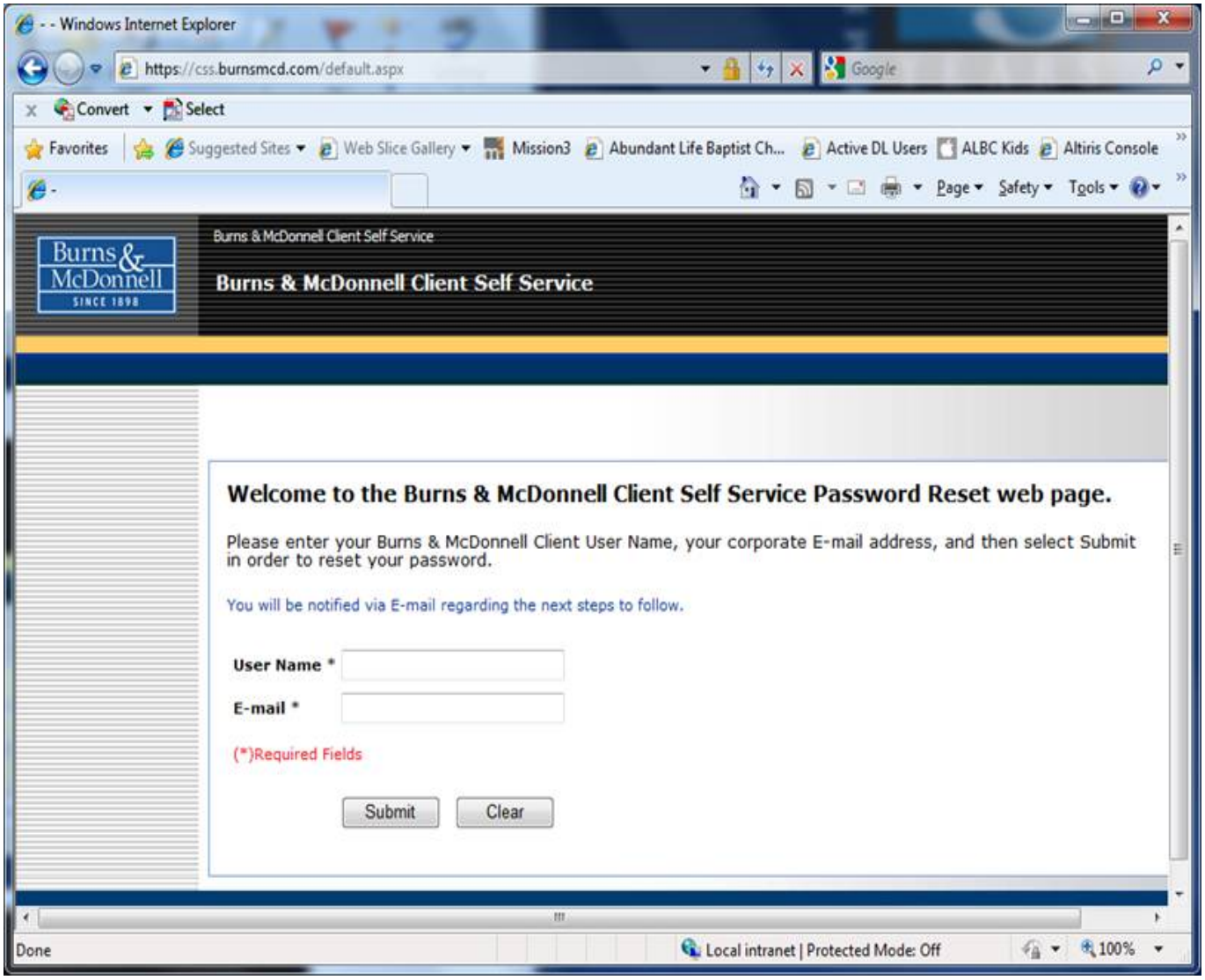
Set New Password screen:



- 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.

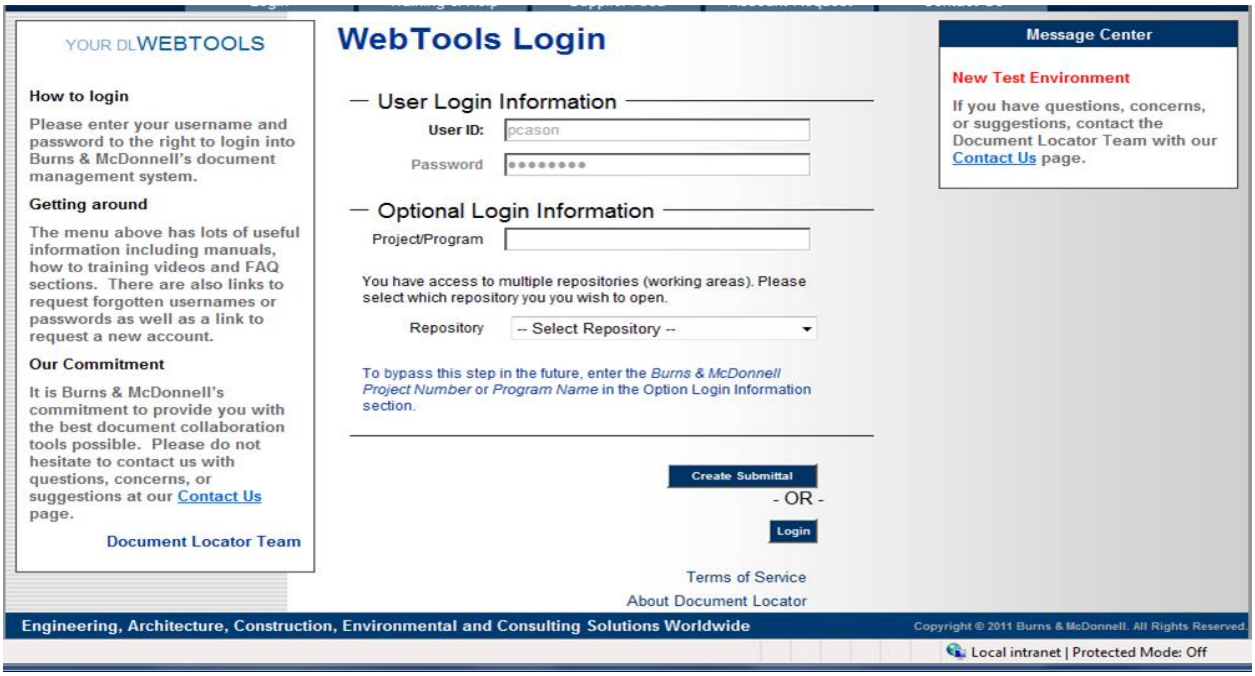
If you forgot your password you can have a new password sent to you by clicking the "Forgot your password". If so, the following screen will appear for requesting a new password.

Request New Password screen:



Creating a Submittal:

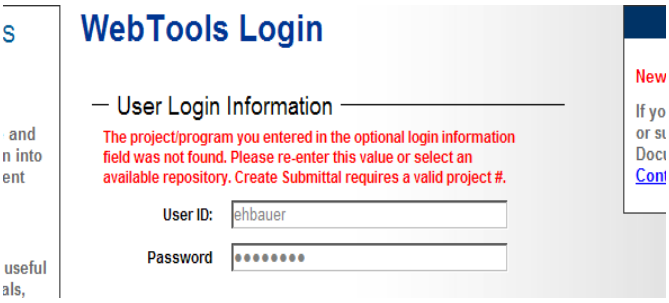
If your password does not need to be changed, use your current User ID and Password to log into WebTools.



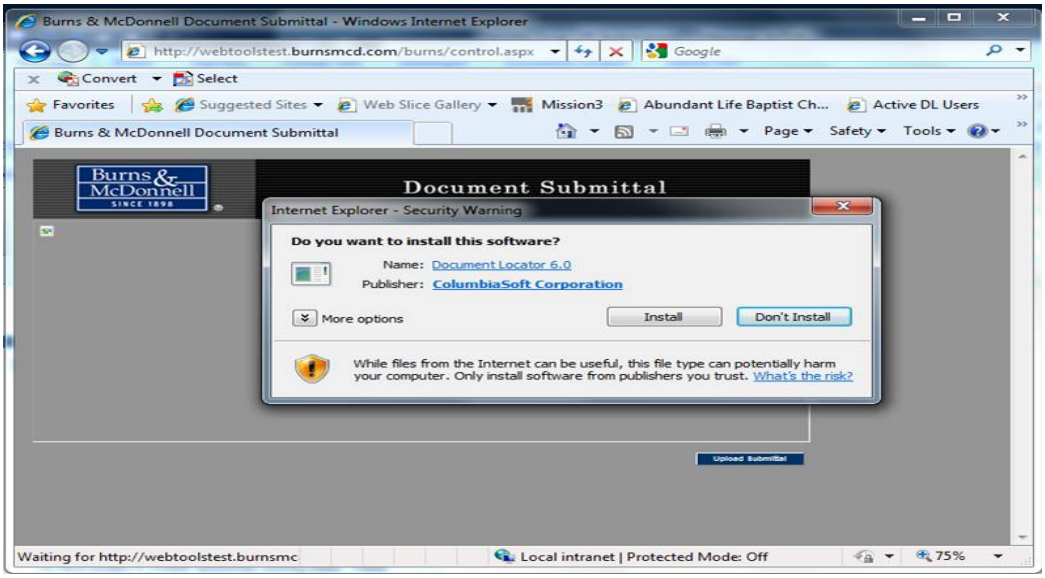
Your username and password information will be automatically populated into the BMcD Login screen.

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.

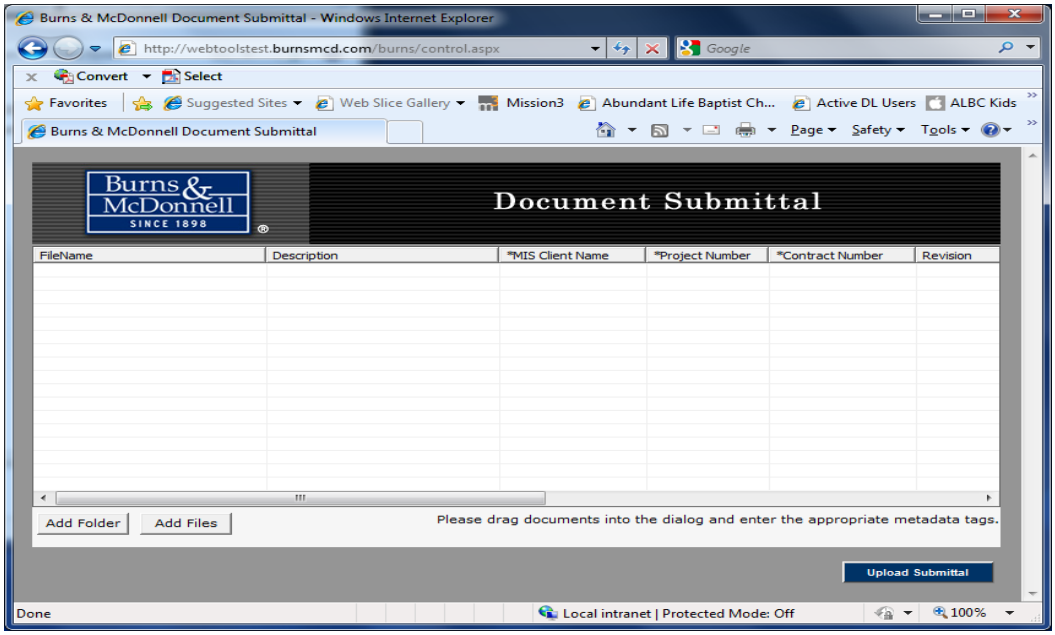
   If the number is incorrectly entered the following error message will be displayed. Check the number, if you believe you received this message in error you will need to contact your BMCD Document Control contact.



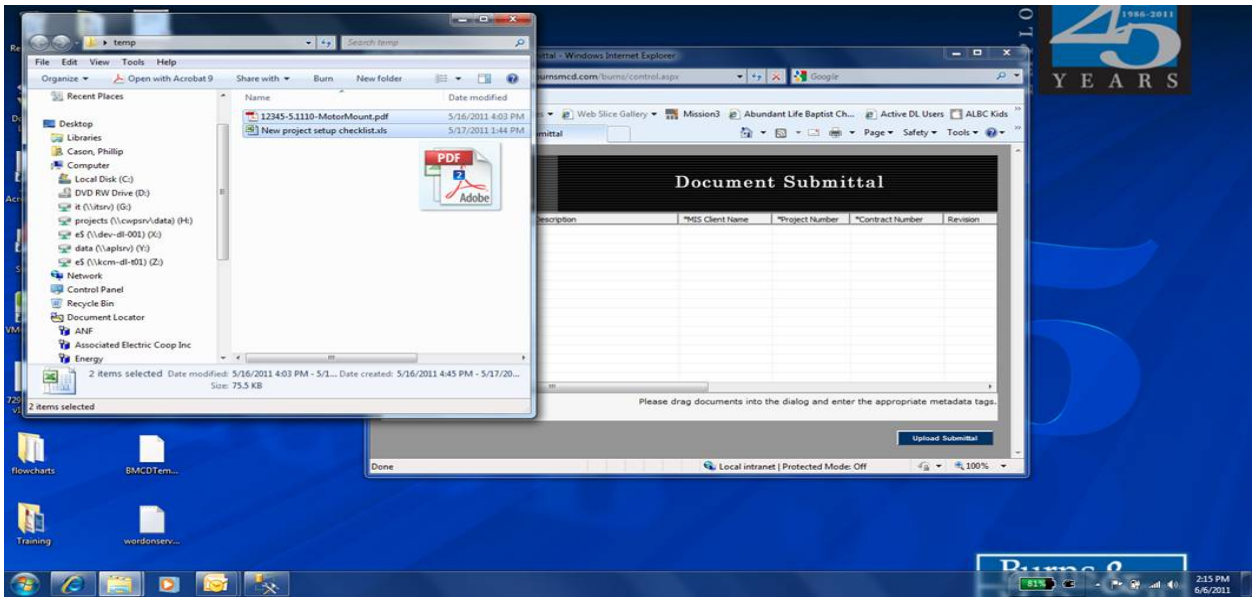
- If this is the first time you are visiting the Submittal screen then you will be prompted to load the ActiveX Add-On that will allow you to drag and drop documents into the screen. Click on Install to load the ActiveX Add-On.
  Note: Some companies prohibit the install of an ActiveX Add-On. If this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



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.

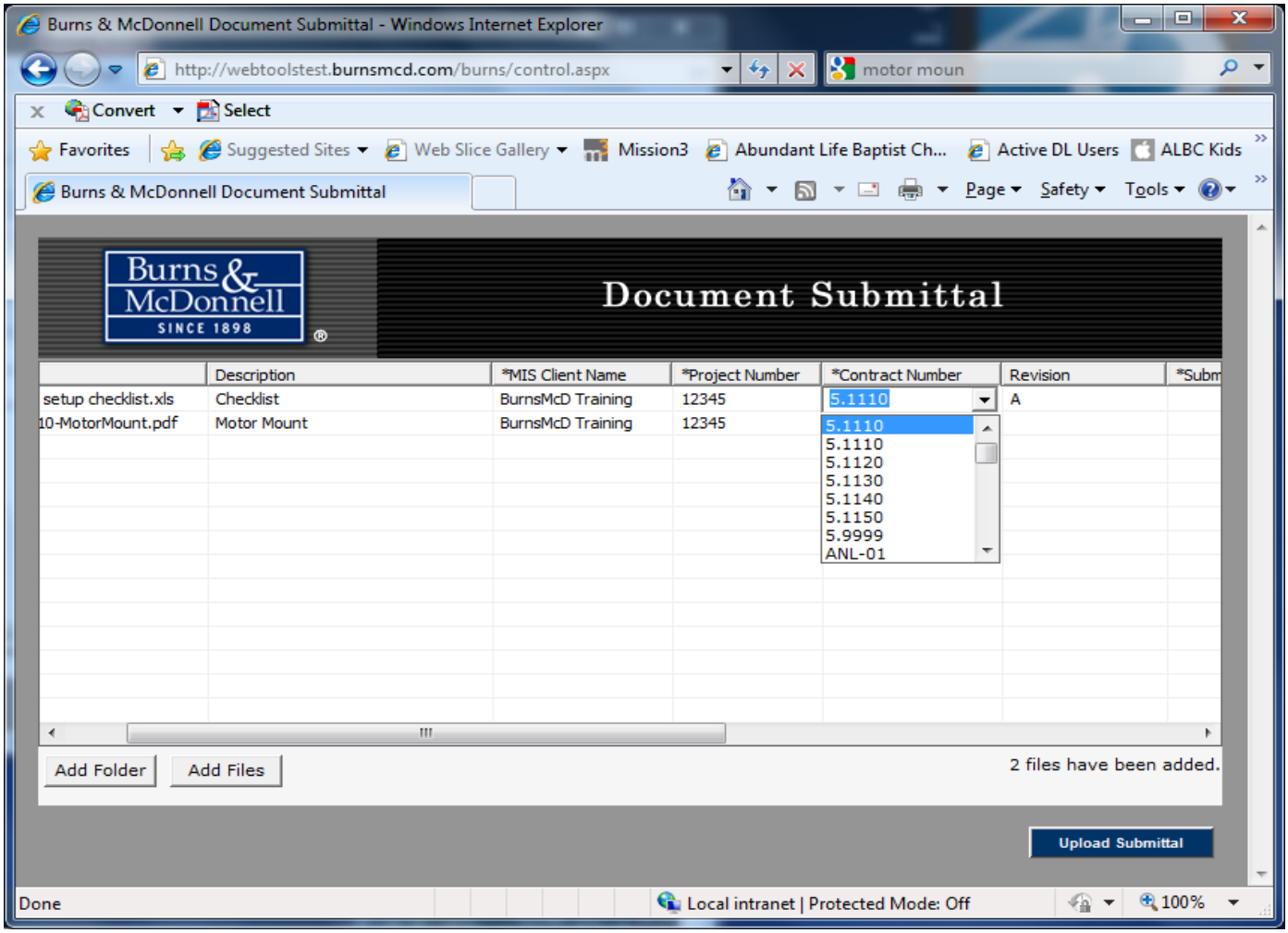
- The Filename, client name, and project number will be pre-populated in the Create Submittal window. <u>Before</u> dragging the files into the window make sure they follow the file naming requirements.
- **Filename** should be the same as the Drawing Name or Document Number.

  <u>Do not</u> include the following in the filenames:

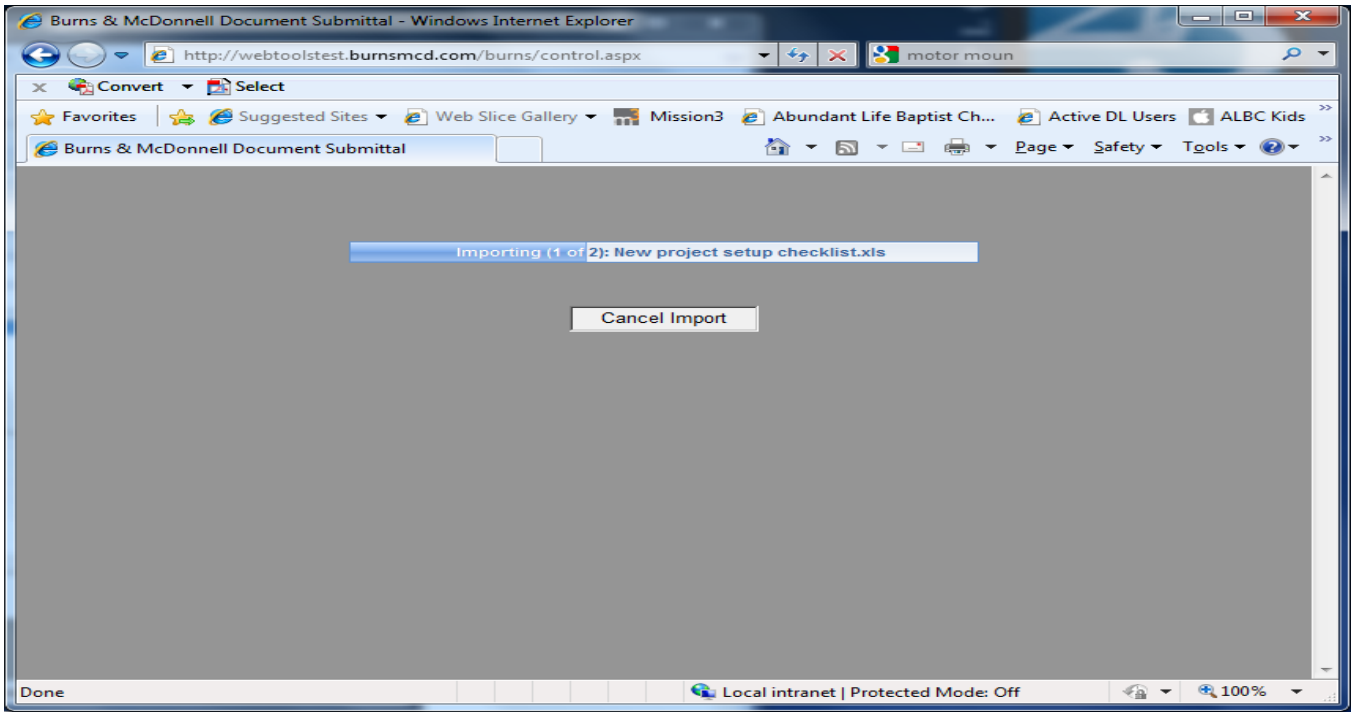
  a. Revision
  b. Dates
  c. Transmittal Information
  Note: If the document is being resubmitted then the filename must match EXACTLY with the previous submittal name.

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

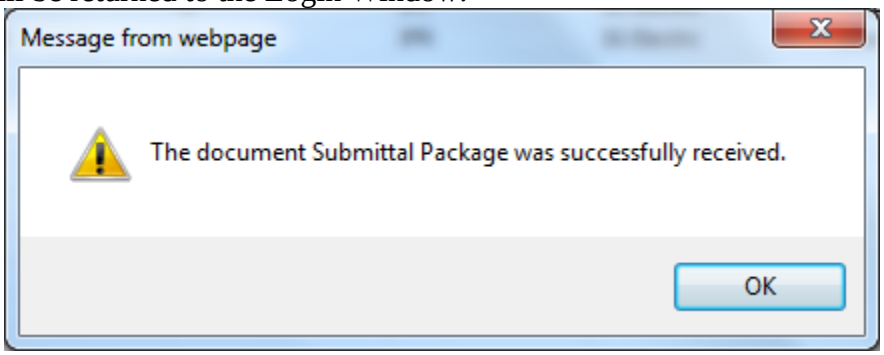
- **Description** is required and should relate to the **document title** from the title block of the drawing.
  Valid description include: General Arrangements, Weld Procedures, Code Calcs, Terminal Point List, Wiring Diagram – Analyzer.
- **Revision** should be the actual revision from the document 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.



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.



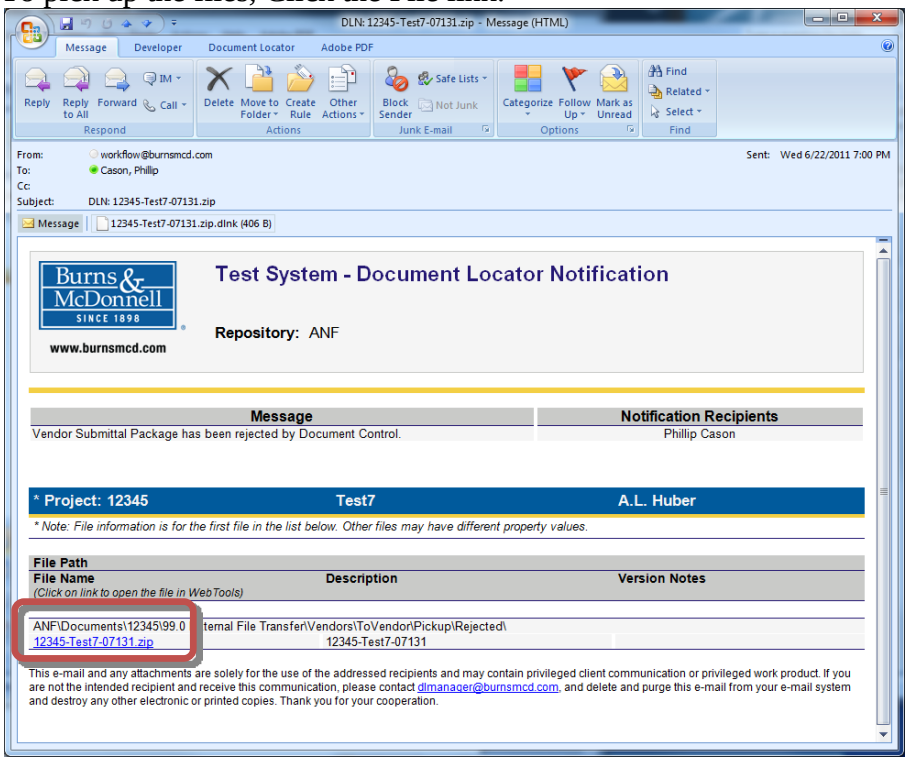
Notification of Receipt:

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.

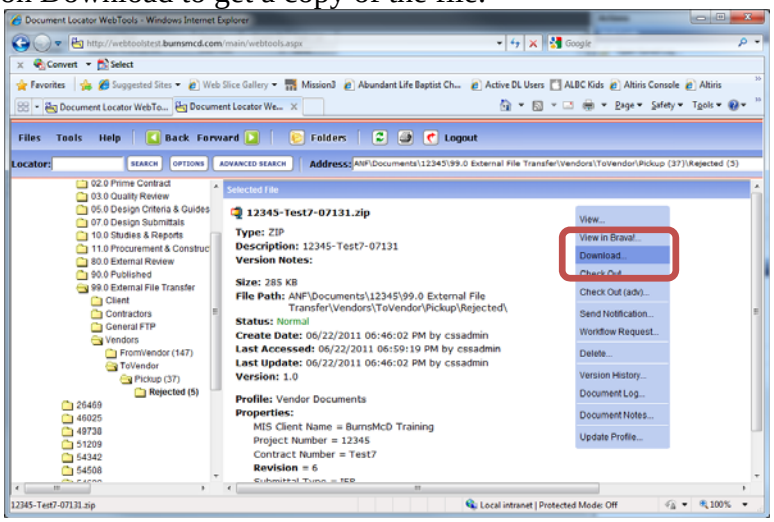
Picking up a Reviewed Submittal

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.
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.

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 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 startup, operation, and testing shall include:
   1. Inspecting and indicating approval or disapproval of the installation.
   2. Reporting his observations in writing to the installing contractor, with copies to Owner, at least once each week unless otherwise agreed.
   3. Determining when Equipment is ready for start-up and operational checks.
   4. Troubleshooting any issues during startup and commissioning of Supplier’s equipment.

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.
   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.
   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 searcheable 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 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.

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 - Carbon 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.

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 Equipment of dead front construction.
B. Furnish Materials suitable for their application, and for the mechanical and electrical stresses to which they will be subjected.
C. Furnish all current-carrying parts of high-conductivity copper unless specified otherwise.
D. Silverplate or tinplate all primary current connections and joints. Plating shall be done after all drilling and cutting operations are completed.
E. Provide space, cutouts, drilling, and blank plates for future equipment and for equipment installed by others where specifically indicated.
F. 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.
G. 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 Supplier's and Engineer'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. Terminate all current transformer secondary leads individually on short-circuiting type terminal blocks located in the control compartment. Connect the current transformer in wye or delta, as required, on the external connection side of this terminal block. Where a current transformer secondary circuit is connected to devices internal and external to the equipment, furnish a second short-circuiting type terminal block for external wiring connections.
    7. No more than two wires shall be terminated at any one terminal block stud or screw.

8. Use stranded, tinned copper switchboard wire, insulated for 600VAC, 90°C copper temperature, Type SIS, as follows:

Type of Circuit	Minimum Wire Size
Indicating light or annunciator	12 AWG
Transducer outputs	16 AWG (shielded)
Circuit breaker close or trip	12 AWG
Current transformer secondary circuits	10 AWG
Potential transformer secondary	12 AWG
Power supply branch circuit	12 AWG
Main ac power supply and main AC control buses	10 AWG
Main dc power supply and main DC control buses	8 AWG

9. Install internal wiring in horizontal and vertical wiring troughs or neatly dressed wire bundles for easy accessibility to interior wiring.
10. Label all wires at equipment studs and terminal blocks with slip-on wire sleeves stamped to indicate wire number and destination terminal number for opposite end of condutor as indicated on approved connection drawings.
11. Connect all internal grounds to the Equipment internal ground bus.
12. Terminate all internal control wiring individually with pre-insulated ring-tongue-type compression terminals on stud or screw-type terminals. Termination of bare control wire is not acceptable.
13. Terminate all potential transformer secondaries on a set of terminal blocks, located to provide convenient access.

H. Terminal Blocks:
1. All terminal blocks shall be heavy duty, rated not less than 30 amperes, 600 volts.
2. Terminal blocks for external control circuits (except in 480-volt motor control centers) shall be General Electric EB-25.
3. Terminal blocks for current transformer circuits shall be short-circuiting type. Furnish General Electric Type EB-27. Furnish with covers and sufficient shorting screws for each terminal.
4. Identify each terminal on each block with a permanent designation.
5. Mount terminal blocks vertically in rows with provisions for supporting external control cables entering from the top or bottom.

I. Finish:
1. Apply finish to all steel surfaces of Equipment.
2. Clean and treat surfaces with phosphatizing process or equal and apply all necessary filler before application of finish.
3. Apply a corrosion-resistant prime coat of paint and at least two finish coats of standard, ANSI 70 light gray paint.
4. Hot-dip galvanize all steel supporting structures and hardware in accordance with ASTM A123 and A153.

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

3.01 GENERAL:

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 261313 - 13,800-VOLT METALCLAD SWITCHGEAR

PART 1 - GENERAL

1.01 SUMMARY:

A. Work in this Section includes furnishing the following:
   1. Assemblies of medium voltage metal-clad arc-resistant switchgear:
      a. 13.8kV, 3000A, 3-phase, 60Hz switchgear 00-EAP-SWG-001.
   2. Each switchgear consisting of the following:
      a. Switchgear assembly as indicated and specified.
      b. Other accessories as indicated and specified.
   3. Maintenance equipment and spare parts as specified.
   4. Field Services as specified.

B. Furnish Equipment suitable for operation on 13,800-volt line-to-line, 3-phase, 3-wire, high-resistance-grounded system.

C. Related Work Specified Elsewhere:
   1. SECTION 262300 – 480-Volt Switchgear and Bus Equipment.

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. American National Standards Institute (ANSI):
      a. C37.04 - Rating Structure for AC High-Voltage Circuit Breakers.
      b. C37.06 – Standard for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis – Preferred Ratings and Related Required Capabilities for Voltages Above 1000V.
      c. C37.09 - Test Procedure for AC High-Voltage Circuit Breakers.
      d. C37.010 - Application Guide for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      e. C37.11 - Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      f. C37.20.2 - Metal-Clad Switchgear.
      g. C37.20.7 – Testing Medium-Voltage Metal-Enclosed Switchgear Rated up to 38kV for Internal Arcing Faults.
      h. C37.90 - Relays and Relay Systems Associated with Electric Power Apparatus.
      i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
      j. C37.100 - Definitions for Power Switchgear.
      k. C57.13 - Requirements for Instrument Transformers.
      l. C57.13.6 – Standard for High-Accuracy Instrument Transformers.
      m. C62.1 – Gapped Silicon-Carbide Surge Arresters for AC Power Circuits.
      n. C62.11 - Metal-Oxide Surge Arresters for AC Power Circuits.
   2. National Electrical Manufacturers' Association (NEMA).
      a. CC1 - Electric Power Connection for Substations.
      b. SG4 – Alternating Current High-Voltage Circuit Breakers.
   3. American Society of Testing and Materials (ASTM).
   4. American Institute of Steel Construction (AISC).

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Includes, but not limited to, the following:

1. Switchgear:
   a. Arrangement and outline drawings.
   b. Installation drawings.
   c. Bills of material.
   d. AC Three-line diagrams.
   e. AC and DC Schematic diagrams.
   f. Point-to-point wiring diagrams that are physically representative of switchgear unit, including external connection terminals.
      (1) Diagrams of control and instrument circuits, contact arrangement of switches, and wiring of relays and instruments for each switchgear unit shall be on additional sheets as required. Interconnection diagrams shall be on separate sheets. All sheets shall be the same size.
      (2) Each item of switchgear mounted Equipment indicated on the diagrams shall be identified by item number and name.
   g. On the erection and assembly drawings, the Supplier shall include complete information for the tightening of all electrical connections secured with bolts or studs. The information furnished shall include torque requirements or complete details of other tightening procedures recommended for bus joints, connector attachments, and contact attachments.
   h. Assembly drawings that include any additional pieces such as arc flash deflection trim or other appurtenances and such devices shall be completely dimensioned on assembly drawings.
   i. Instrument transformer performance curves and nameplate data.
   j. Protective device coordination curves on full-size (9-1/2" x 11-1/16") log-log graph paper (similar to K& E No. 48-5258).
   k. Communications protocol information for all data communication devices and systems including communications connection diagrams and any applicable register lists.
   l. Instruction books.
   m. Separate schematic and wiring drawings shall be submitted for each breaker furnished. "Typical" drawings covering several breakers will not be acceptable.

C. In addition to other Submittal requirements, final drawings shall be furnished as AutoCAD Version 2012 files on PC - compatible CD-ROM disks.

1.04 QUALITY ASSURANCE:

A. Factory Tests: Submit certified statements that the Equipment furnished under this Section has passed the design and production tests in conformance with the ANSI Standards listed.

B. Type test evidence must be submitted to verify that prototype equipment was tested in the same configuration that is used to construct the Equipment provided under this Contract.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Circuit Breakers:
   1. ABB.
   2. Eaton.
   3. Powell.
   4. Siemens.

2.02 BREAKERS: Breakers shall be designed and constructed to conform to applicable standards and the following requirements:

A. Ratings as defined in IEEE C37.04, under altitude and ambient temperature conditions specified:
   1. Nominal Voltage Class: 13.8 kV.
   2. Rated Maximum Voltage: 15 kV.
   3. Rated Voltage Range Factor: 1.0
   4. Rated Withstand Test Voltages:
      a. Low Frequency: 36 kV.
      b. Impulse: 95 kV.
   5. Continuous current ratings: As indicated on drawings.
   6. Rated Short-Circuit Current: 50,000 Amperes.
   7. Rated Interrupting Time: 3 cycles.
   8. Rated Permissible Tripping Delay: Two seconds.
   9. Related Required Capabilities:
      a. Maximum Symmetrical Interrupting and Short Time Capability: 50,000 Amperes.
      b. Closing and Latching Capability: 130,000 Amperes.
   10. Rated Control Voltage: 125 volts DC.
   11. Control Voltage Range: 90-140 volts DC.

B. Type and Design:
   1. 3-pole, single-throw draw-out vacuum circuit breaker.
   2. Flame-retardant and track-resistant insulation materials.
   3. Self-aligning primary and secondary disconnecting devices.
   4. Auxiliary contacts, designated "52a" and "52b", mounted on each removable breaker element in sufficient quantity for all control and indicating functions integral to the breaker element. Furnish not less than four additional contacts for the Owner's use, two "a" and two "b" contacts.
   5. Secondary disconnecting devices shall be made in the breaker element test position to eliminate need of jumper cable.
   6. Provide provisions for manual stored energy closing, manual stored energy tripping, and spring recharge on loss of control power.
   7. All breakers of the same current rating shall be completely interchangeable.
   8. Breakers shall be removable from the front and shall be able to be racked in with all doors closed.
   9. The operating mechanism shall be trip-free in any position and shall include anti-pump provisions.
   10. The breaker main contacts shall not touch or arc across into a faulted circuit when a breaker close signal is received while a trip signal is being applied.
   11. Each breaker shall be furnished with a manual trip push button that mechanically trips the breaker. The manual trip push button and its associated breaker trip linkage shall have no common components with the electrical trip mechanism, except for the final breaker release device.
   12. All breakers designated as generator circuit breakers shall include integral DC undervoltage trip release relays (truck mounted) which shall trip and block closing of the breaker in the event of a loss of breaker DC trip control voltage.
   13. Arrangement shall be provided for remote rack-in and rack-out of the breaker.

2.03 SWITCHGEAR: Switchgear shall be designed and constructed to conform to applicable standards and the following requirements:

A. Equipment shall be arranged as indicated on one line diagrams. Drawings are preliminary. Supplier shall proceed with design and issue certified shop drawings only after receiving final and approved arrangement drawings from the Engineer.
B. Voltage and short circuit current ratings shall be equal to those specified for the circuit breakers.
C. Main bus continuous current rating as indicated.
D. General Construction Details:
   1. Arc-resistant, free-standing, indoor, metalclad, dead-front, draw-out type with one circuit breaker per vertical section located in the bottom compartment.
   2. Arrangement of breaker units in each lineup shall be as indicated in one-line diagram.
   3. Switchgear shall be arc-resistant, Type 2B as defined for medium voltage switchgear in IEEE C37.20.7, protecting:
      a. The front.
      b. The sides.
      c. The back.
      d. All low voltage and instrument compartments.
   4. Arc resistant switchgear shall be designed to withstand the pressure wave and not permit burn through of the walls, or doors for minimum arc duration of 10 cycles. The arc-resistant switchgear shall be designed to minimize the spread of internal arcing faults and to provide protection to operating personnel by containing the arc byproducts and venting the gases in a safe controlled manner.
   5. Front hinged doors with single lever latch and removable bolted-on rear panels. Hinged doors shall close completely when the breaker is in the "disconnected" position. No additional bolting on hinged doors shall be required to meet short circuit rating.
   6. Bid shall include a minimum of 10 linear feet of arc exhaust duct and any required fittings. Duct shall be steel and have same exterior finish and paint as other switchgear equipment.
   7. Furnish arc exhaust duct hoods at exterior of building with integral dampers to allow for exhausting of arc flash while preventing outdoor elements from entering duct. Hoods shall be steel and have same exterior finish and paint as other switchgear equipment.
   8. Design shall be such that in case of an internal arc fault, all related exterior vents shall automatically close and pressure shall be directed into arc flash plenum and duct to exhaust gases to exterior of building.
   9. Where ventilation openings are required on the top of the switchgear, furnish a raised lip around and a cover over each group of ventilation openings to prevent the entrance of liquids dripping onto the top of the switchgear.
   10. High voltage buses shall be installed with rigid, non-tracking, fire-resistant, and nonhygroscopic insulating supports that are capable of withstanding the mechanical forces imposed by short-circuit currents equal to the close and latch and short-time current ratings (short-circuit making current and short-time withstand current ratings) of the circuit breakers.
   11. Ground bus with short time rating equal to that of the circuit breakers in the assembly extending the full length of the switchgear with 250kcmil connectors having 2 NEMA sized and spaced holes for ground cable connection at each end of each assembly. Connections to the ground bus shall not be coincident with the support bolts or splice joints. Ground each unit housing to this bus as well as each circuit breaker when in connected or test positions. Extend the ground bus to within six inches of the rear of each unit housing for grounding of Owner's power cable shields.

12. Safety shutter covering the breaker connections painted a contrasting color, or identified by large letters painted a contrasting color so that section covering the main bus terminals is clearly distinguishable from the section covering the external connection terminals.
13. All current-carrying power connections shall be bolted connections, and all joints shall have minimal contact resistance.
14. Termination equipment for high-voltage connections:
    a. Furnish top-entry, metal-enclosed bus duct entrance connections as indicated. Include means for termination of the metal-enclosed bus duct enclosure or ground bus on the switchgear ground bus. Bus duct shall not be supported by current-carrying conductors. All required transpositions shall be made in the switchgear.
    b. Furnish tying bars for cable support in breaker units for connection of insulated shielded copper power cable entering from below.
    c. Cable terminals shall be silver-plated or tin-plated copper or aluminum NEMA 2-hole pads capable of terminating up to four (4) 1/C 750KCMIL insulated shielded copper power cables per phase.
    d. Cable entrance locations and ground sensor current transformer locations shall be field adjustable up or down and to the left or right of center in each vertical section to accommodate incoming conduits and cables.
15. Furnish all auxiliary metalclad compartments required, and spare compartments where indicated. All circuit breakers shall be furnished in the bottom compartment of each cubicle.
16. Switchgear bus phase sequence shall be clearly identified in the main breaker cubicle as 1-2-3 in conformance with IEEE C37.20.2, Article 7.1.2.
17. Furnish switchgear space heaters, and switchgear space heater power supplies as follows:
    a. Furnish 240 VAC-rated space heaters in each vertical section to prevent condensation. Apply space heaters at one-half rated voltage. Heaters shall be switched with a combination of 52H/b and 52S/b auxiliary contacts in parallel.
    b. One (1) 120-volt AC, single-phase, 2-wire power supply to the lineup of switchgear shall be furnished by Others for switchgear space heater supply. This main supply shall be protected by a Supplier-furnished main circuit breaker.
    c. Supplier shall furnish all branch circuit protection and interconnecting wiring such that the switchgear space heaters from each line-up of switchgear shall be supplied from the single power supply.
18. Furnish three metal oxide surge arresters (one per phase) for each feeder and main circuit breaker, coordinated with transformer insulation levels to provide complete protection from surges created by vacuum interrupters.
19. Terminal Blocks:
    a. Wire all spare contacts from breaker auxiliary switches and lockout relays to external connection terminal blocks.
    b. Terminal blocks for external connection to the switchgear shall include not less than ten spare grouped terminals in each breaker unit. Spare terminals shall have no connections or designated field or future connections.
    c. Terminal blocks shall not be mounted in compartments containing cable or bus operating at voltages above 600 volts.
    d. Each terminal block, conductor, relay, circuit breaker, fuse block, and other auxiliary devices and terminals shall be permanently labeled to coincide with the identification indicated on the drawings.
20. Control Wiring:
    a. Internal control wiring shall be in accordance with specification Section 260002.

b. All wiring terminations shall be identified by wire sleeves on both ends of each conductor with wire number and reverse destination termination information.

21. Provide engraved laminated plastic nameplates for each switchgear assembly, each breaker unit, and each instrument and each control device mounted on the Equipment in accordance with specification Section 260002.
22. Furnish IR windows on rear of each vertical section of switchgear in which a power connection is made to enable thermography monitoring of power connections without having to open switchgear.
23. If specified, provisions for remote racking shall be included in the switchgear. Requirements for the remote racking control are listed in the Article "Maintenance Equipment and Spare Parts," this Section.

E. Instrument Transformers, Instruments, Relays, Meters, Switches and Other Control Devices:

1. Furnish and install all instrument transformers as indicated. Instrument transformers shall conform to applicable standards and shall meet the following requirements:
   a. Potential Transformers (PT): Current limiting fused, mounted on disconnecting primary type carriages with grounding devices, cast epoxy resin or butyl molded insulated or equal, 14400- 120-volt, 500-VA thermal rating in 30 degrees C ambient, with accuracy classification of 0.3 W, X, Y, Z, and M. Wire to set of terminal blocks for easy external connection.
      (1) For bus potential transformers, connect an auxiliary 500-VA at 30 degrees C, 1:1 wye-broken delta PT to the secondary of the 120:1 bus PT. Auxiliary PT shall be ABB type PPM or approved equal.
      (2) Furnish and connect, in parallel, an ABB VT Guard Pro and Post Glover adjustable damping resistor across the broken delta terminals of the auxiliary PT. Use of a heating coil as ferroresonance damping resistor is not acceptable.
   b. Current Transformers (CT): Dry type, toroidal bushing or wound type, with ratio as indicated, or as required for application. "C" or "B" accuracy classification in conformance with IEEE C57.13, except that for phase current transformers, accuracy classification shall be not less than C200 or B0.3. Current transformers for differential circuits shall not be less than C200~~400~~. Current transformers shall have thermal and mechanical ratings corresponding to that of the breaker with which CT is applied.
2. Include all instruments, relays, meters, switches, and other devices specified and indicated as located at the switchgear. Specific types shall be as indicated in Table 1 at the end of this Section.
3. Protective relay CT circuits shall include ABB type FT-1 test switches as indicated on AC schematics. Protective type relays shall have external reset trip indicators.
4. All relays shall be rated for continuous picked-up service.
5. All solid-state protective relays shall be designed to withstand the surge withstand capability (SWC) test of IEEE C37.90.1.
6. For each set of potentials, furnish an FT-1 switch located on the front of the switchgear as indicated on AC schematics.
7. Ammeter switches shall have the neutral made up outside the switch to permit additions to the CT circuit.
8. Include ground sensor equipment, where indicated, designed to provide sensitive ground fault protection while being insensitive to phase-to-phase faults or normal load inrush currents.

F. Control Arrangement:

1. General Control Items and Features: Include the following:
   a. Provisions for remote control with breaker control schemes to be operable in both "connected" and "test" positions of breaker as indicated on DC Schematics.
   b. Local control switch with red and green light for each breaker with switch operable only in the "test" position of breaker, lights operable in both the "connected" and "test" positions.
   c. Two mechanically interlocked 10,000 AIC molded-case circuit breakers in each lineup for connection of switchgear 125-volt DC bus to the "normal" or "standby" external supply circuits. Provide 125-volt DC undervoltage alarm relay connected across 125-volt DC trip and close power branches of each breaker with form “C” dry contact output wired out for remote alarm.
   d. Three molded-case circuit breakers for each breaker. Electrical control scheme shall be similar to IEEE C37.11, Figure 1, Diagram B, 2 with the trip and close circuits individually protected. Relay DC power shall also have its own DC circuit breaker. DC breakers shall each include one (1) form “C” auxiliary dry contact for breaker status indication wired for remote alarm.
   e. One or more 125-volt DC main breaker(s) to accept Owner’s 125-volt DC connection(s).
   f. Auxiliary contacts for each breaker unit (52S) mounted on the stationary portion of the switchgear (52 MOC as defined in IEEE C37.20.2). Provide a minimum of eight 52S/a and eight 52S/b contacts. Contacts shall be field-convertible to either a or b type. Stationary-mounted auxiliary contacts shall normally be inoperable when the breaker element is in the "test" position. One set of equipment for making "52S" contacts operable in the "test" position shall be furnished with each breaker, and shall be field installable and removable without the use of any special tools.
   g. Removable element position switches (52H) (52 TOC as defined in IEEE C37.20.2) with four "a" and four "b" auxiliary contacts in each breaker unit to be used with certain 52 and 52S auxiliary switch contacts when circuit breaker is in the "test" position or is removed from the cubicle.
   h. Provide amber trip and blue supervise lights for each lockout relay. Provide contacts on lockout relays in the quantities required to operate lights and perform tripping, lock-out and alarm functions indicated. Provide a minimum of two spare "a" and two spare "b" contacts on each lockout relay as shown in DC schematic drawings. The lockout relays shall be Electroswitch type LOR24 with integral indicating lights.
2. Breaker Control Schemes: prepare schematic diagrams in accordance with the typical control schemes indicated.

G. Alarms: Include remote alarms as indicated on the typical schemes.

H. Provide An Outgoing Feeder Protection Scheme:
1. A SEL-751A multifunction relay shall be provided for main outgoing feeder protection and shall be installed in the door of the feeder breaker cubicle.
2. An FT-1 test switch shall be installed for the current and potential circuits to the relay as shown on AC Schematic diagram.
3. The SEL-751A shall be connected to current transformers on the bus side of the main breaker.
4. Install an Electroswitch LOR lockout relay on the door of the breaker cubicle.
5. Wire coil and contacts to terminal blocks. Wire the coil of the lockout relay to the designated trip output of the SEL-751A relay. Provide additional terminals as indicated for external trip inputs to the lockout relay. Wire normally closed contacts from the

lockout relay as indicated to a terminal block. Wire normally open contacts to a trip test switch and terminal blocks as indicated. Wire from each test switch to a terminal block.

I. Provide an Auxiliary Transformer Feeder Protection Scheme:
   1. A SEL-787 multifunction relay shall be provided for auxiliary transformer feeder protection and shall be installed in the door of each feeder breaker cubicle.
   2. An FT-1 switch shall be installed for the current and potential circuits to the relay.
   3. The SEL-787 shall be connected to current transformers on the bus side of the feeder breakers and to current transformers from the bus side of the 480V switchgear main breakers.
   4. Install an Electroswitch LOR lockout relay on the door of feeder breaker cubicles.
   5. Wire coil and contacts to terminal blocks. Wire the coil of the lockout relay to the designated trip output of the SEL-787 relay. Provide additional terminals as indicated for external trip inputs to the lockout relay. Wire normally closed contacts from the lockout relay as indicated to a terminal block. Wire normally open contacts to a trip test switch and terminal blocks as indicated. Wire from each test switch to a terminal block.

2.04 OUTSOURCING OF COMPONENTS

A. The Supplier shall include a list of all Equipment components that will be sourced from outside the final assembly plant with lead times longer than 30 Days with the Bid. This list shall give a detailed description of the component, its manufacturer, and the location it will be shipped from.

2.05 FACTORY ACCEPTANCE TESTS

A. After the switchgear has been completely fabricated, it shall be tested in accordance with the manufacturer's standard tests.
B. The Owner reserves the right to witness all tests. The Owner shall be notified two weeks in advance of the factory testing and may witness the testing for specification conformance at the factory prior to shipment.
C. Factory testing shall be include the following minimum items in accordance with all applicable standards:
   1. High voltage tests for all main and control circuits.
   2. Mechanical operation and interlocks.
   3. Circuit breaker operation tests, including local and remote trip/close.
   4. Current transformer and voltage transformer ratio and polarity check.
   5. Complete wiring check.
   6. Overall fit and finish.
   7. Accuracy of calibrated pickup and dropoff levels over the range of relay settings.
   8. Ethernet network verification and testing.
   9. Protective relay communications testing.

2.06 MAINTENANCE EQUIPMENT AND SPARE PARTS: Furnish the following maintenance equipment and spare parts:

A. One breaker test cabinet complete with 125V DC input, secondary disconnecting devices, test jumper, control relays, and push buttons, suitable for column mounting.
B. One set of ~~special wrenches and~~ removable hand cranks for breaker racking and manual spring recharge.
C. Two sets of test plugs for meters, relays, and test switches.
D. One breaker lift truck for removing and replacing breakers and VT carts in compartments including all necessary rails and removal hardware.

E. One ground and test device with six primary contacts mounted on a draw-out circuit breaker chassis to facilitate making ground or cable connections to primary stationary contacts by inserting the device in place of the draw-out circuit breaker. The device shall be dead-front, manually operated, with shutters to be opened for access to terminals, or with insulated test plugs. Device shall have adapters to fit the various ampere ratings of cubicles, or if adapters are not available a separate device shall be furnished for each ampere rating of cubicles. Devices shall be keyed for insertion in either the upper or lower compartment, but not both. Each device shall be clearly identified. Ground and test devices shall be rated equivalent to switchgear short circuit ratings.
F. Six spare primary fuses of each voltage and current rating used in the switchgear.
G. Twelve spare secondary fuses of each voltage and current rating used in the switchgear.
H. One remote racking device with 30-foot cable and remote operator station that may be connected to any switchgear and allow racking the breaker from test to operating position.
I. One (1) spare 3000A breaker.
J. Recommended spare parts list with price by manufacturer and listed in Supplier's Bid.

PART 3 - EXECUTION

3.01 FACTORY TESTS:

A. Bid Price shall include the required man-days and round trips to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.
B. Circuit Breakers: Test and Checks
   1. Megger each pole of breaker for freedom from grounds.
   2. Operate the breaker manually and visually inspect the breaker.
   3. Check for proper clearances of all items.
   4. Check for proper lubrication.
   5. Inspect all bushings.
   6. Check all secondary contacts for proper operation.
   7. With breaker in switchgear, operate the breaker electrically and check for proper operation.
   8. Check continuity of breaker frame ground.
   9. Owner will perform other field testing under a separate contract, including:
      a. Field high-potential test of each breaker.
      b. Check of each breaker electrical operation for conformance with electrical schematics.
C. Metalclad Switchgear -Test and Checks:
   1. Check all safety interlock mechanisms for proper lubrication, adjustment, and operation.
   2. Megger all power buses with a 1,000-volt megger. Grounded ac circuits, instruments, and fuses should not be meggered.
   3. Inspect all buses, surge arresters, and insulators.
   4. Inspect control and instrument switches and adjust contacts if required.
   5. Check all fuses.
   6. Check connections to instruments and adjust instrument indicating pointers.
   7. Check operation of switchgear alarm contacts.
   8. Initial check of proper breaker tripping by manual or electrical operation of protective relay contacts.
   9. Check all circuit breaker cell interlocks for conformance with the Specifications.
   10. Check all internal electrical interlocks and automatic transfer sequences for specified operation.

11. Functional tests of all metering units, multi-function relays, and communications I/O equipment.
12. Owner will perform other field testing under a separate contract, including:
    a. Field high-potential test of switchgear buses.
    b. Check and measure equipment grounds.
    c. Check operation of heaters in bus duct and switchgear where specified.
    d. Conduct polarity tests on current and potential transformers.
    e. Bench testing of all protective relays, and setting of values specified by the Owner/Engineer.
    f. Protective relay trip testing of breakers by high current tests or other electrical means, and energized checks on relaying circuits as required by the Owner/Engineer.

3.02 FIELD SERVICES:

A. Bid Price shall include five man-days and one round trip to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.

B. Manufacturer's field representative shall assist installing contractor with assembly and installation of switchgear per Supplier's installation and operation and maintenance manuals.
    1. Inspection of switchgear for damage during shipment and installation.
    2. Makeup of shipping split wiring connections.
    3. Makeup of shipping split bus and enclosure connections.
    4. Verification of final setting of the switchgear lineup per Supplier's requirements.
    5. Coordinate and make installing contractor aware of any additional installation requirements.
    6. Insert breakers and instrument transformers into cubicles and verify alignment. Adjust alignment if necessary for proper operation.

Table 1

Device	Manufacturer	Type	Substitute
(1) Breaker Control Switches	Electroswitch	Series 24	No
(2) Lockout Relays	Electroswitch	Type 24 LOR	No
(3) Selector Switches	General Electric	CR104P	Or Equal
(4) Indicating Lights	General Electric	ET-16 LED Cat. #116B96708 G43	Or Equal
(5) Auxiliary Transformer Protection Relay	Schweitzer	787 Part # 0787EX1ACACA75850830	No
(6) Main Breaker Relay	Schweitzer	751A Part # 751A51A1A1A76850810	No
(7) Bus Differential 87B	Schweitzer	587Z Part # 0587Z0X615312XX	No
(8) Power Meter	Schweitzer	735 Part # 0735HX00944GXXA4XX1610 1XX	No
(9) Auxiliary Relay in Trip and Close Circuits	ABB	MG-6	Or Equal
(10) Current and Potential Test Switches	ABB	FT-1	No
(11) Zero-sequence Overvoltage 59N	Basler	BE1-59N Part # BE1-59NA5E-E1J-C0N1F	No

END OF SECTION 261313

SECTION 262300 - 480-VOLT SWITCHGEAR AND BUS EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY:

A. Work in this Section includes furnishing the following:
   1. The following main-tie-main 480V, metal-enclosed switchgear lineup, consisting of a transformer remotely connected to a coordinated assembly of metal-enclosed switchgear via non-segregated phase bus duct:
      a. 480V Switchgear Lineup 00-EAP-SWG-011.
   2. Maintenance equipment and spare parts as specified.
   3. Field Services as specified.

B. Furnish Equipment suitable for operation on 480 volt, 3-phase, high-resistance grounded systems.

C. The Equipment specified in this Section shall also conform to the requirements of SECTION 260002.

D. Related Work Specified Elsewhere:
   1. SECTION 261313 – 13,800-Volt Metalclad Switchgear.

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 Electronics Engineers (IEEE):
      a. C37.11 - IEEE Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
      b. C37.13 - Low-Voltage AC Power Circuit Breakers Used in Enclosures.
      c. C37.16 - Preferred Ratings, Related Requirements, and Application Recommendations for Low-Voltage AC (635 V and below) and DC (3200 V and below) Power Circuit Breakers.
      d. C37.17 - Trip Systems for Low-Voltage (1000 V and below) AC and General Purpose (1500 V and below) DC Power Circuit Breakers.
      e. C37.20.1 - Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear.
      f. C37.23 - Metal-Enclosed Bus.
      g. C37.81 – Guide for Seismic Qualification of Class 1E Metal-Enclosed Power Switchgear Assemblies.
      h. C37.90 - Relays and Relay Systems Associated With Electric Power Apparatus.
      i. C37.90.1 - Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems.
      j. C37.100 - Definitions for Power Switchgear.
      k. C39.1 - Requirements for Electrical Analog Indicating Instruments.
      l. C57.13 - Standard Requirements for Instrument Transformers.
   2. National Electrical Manufacturer's Association (NEMA):
      a. CC 1 - Electric Power Connectors for Substations.
      b. SG 5 - Power Switchgear Assemblies.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Includes, but not limited to, the following:
   1. Arrangement and outline drawings.
   2. Installation drawings.
   3. Bills of Material.

4. One-line diagrams.
5. AC three-line diagrams.
6. AC & DC schematic diagrams.
7. Wiring diagrams, including external connections terminals.
8. Instrument transformer performance curves and data.
9. On the erection and assembly drawings, the Supplier shall include complete information for the tightening of all electrical connections secured with bolts or studs. The information furnished shall include torque requirements or complete details of other tightening procedures recommended for bus joints, connector attachments, and contact attachments.
10. Assembly drawings that include any additional pieces such as arc flash deflection trim or other appurtenances and such devices shall be completely dimensioned on assembly drawings.
11. Protective device coordination curves on full-size (9-1/2"x11-1/16") log-log graph paper (similar to K&E No. 48-5258).
12. Communications protocol information including project-specific register list for all data communication devices and systems.
13. Instruction books.
14. Separate schematic and wiring drawings shall be submitted for each breaker. "Typical" drawings covering several breakers will not be acceptable.
15. Details on insulating barriers between cable terminals and main bus.

C. In addition to other submittal requirements, final drawings shall be furnished as AutoCAD 2012 files on PC-compatible CD-ROM disks.

1.04 QUALITY ASSURANCE:

A. The switchgear shall completely wired and tested at the factory.

B. Factory Tests: Submit certified statements that the Equipment furnished has passed the design and production tests in conformance with the standards listed. The tests shall include but not limited to:

1. Draw-out Air Circuit Breakers Tests and Checks:
   a. Megger each pole of breaker for freedom from grounds.
   b. Check operating voltage at closing and tripping coils to determine if voltage is of proper value. Check fuses.
   c. Operate the breaker manually and visually inspect the breaker.
   d. Adjust the gap of the primary contacts according to manufacturer's instructions.
   e. Check for proper clearances of all items.
   f. Check for proper lubrication.
   g. Inspect all bushings and arc chutes for condition and cleanliness.
   h. Check all secondary contacts for proper operation.
   i. With breaker in switchgear, operate the breaker electrically and check for proper operation.
   j. Check continuity of breaker frame ground.
2. Metal-Enclosed Switchgear Tests and Checks:
   a. Check all safety interlock mechanisms for proper lubrication, adjustment and operation.
   b. Megger all power buses with a 1,000-volt megger. Grounded AC circuits, instruments and fuses should not be meggered.
   c. Inspect all buses and insulators for condition and cleanliness.
   d. Inspect control and instrument switches for clean and properly adjusted contacts.

e. Check all fuses.
f. Check connections to instruments and adjust instrument indicating pointers.
g. Check operation of switchgear alarm contacts.
h. Initial check of proper breaker tripping by manual or electrical operation of protective relay contacts.
i. Check all circuit breaker cell interlocks for conformance with the Specifications.
j. Check all internal electrical interlocks and automatic transfer sequences for specified operation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Power Circuit Breakers:
1. ABB.
2. Eaton.
3. Siemens.
4. GE.

2.02 POWER CIRCUIT BREAKERS: Power circuit breakers shall be designed and constructed to conform to applicable standards and the following requirements:

A. Ratings:
1. 600 volts ac, three phase, 60 hertz.
2. 4 cycle or less interrupting time.
3. 5 cycle closing on all electrically operated breakers.
4. Current ratings (unfused breakers):

Designation	Continuous Rating (RMS Amps)	Short Circuit and and Short Time Rating Without Requiring Instantaneous Tripping (RMS Symmetrical Amps at 508 volts)
4000	4,000	85,000
3200	3,200	65,000
2000	2,000	65,000
1600	1,600	65,000
800	800	65,000

B. Type and Design:
1. Three pole, single throw.
2. Electrically and mechanically trip free.
3. Drawout type.
4. All breakers shall be electrically-operated and control voltage shall be 125-volts DC.
5. Manual closing handle whether manual or electric operation.
6. Microprocessor overcurrent trip devices.
   a. Self-contained with breaker and shall not require an external control power source to trip the breaker under fault or overload conditions.
   b. Trip units shall include metering and LSIG trip functions.
   c. Functions are defined as follows:
      (1) L - Adjustable long time.
      (2) S - Adjustable short time.
      (3) I - Adjustable instantaneous.

(4) G - Adjustable ground.

d. Instantaneous and Ground functions shall be able to be turned off.

e. Trip units shall be RMS sensing and shall provide selective tripping among main, tie, and feeder breakers.

f. Trip units shall provide targets for all trip functions and internal diagnostics of the circuitry.

g. Trip units shall be capable of transmitting all real time metered data to Owner's computer system via a standard RS-422 or RS-485 interface with a single external connection point for communications. Supplier shall furnish an Ethernet gateway to allow for additional Modbus TCP/IP connection.

7. Overcurrent lockout and alarm contact output with hand reset, actuated only by the overcurrent trip device.
8. Individual removable arc chutes on each phase, constructed of suitable material for arc interruption, and special flame-retardant, track-resistant insulation.
9. Self-aligning primary and secondary contacts.
10. For electrically operated breakers, furnish a minimum of two "a" and "b" auxiliary contacts mounted on each removable breaker element for Owner's use in external control circuits. Furnish additional contacts as required or indicated.
11. For manually operated breakers, provide two "a" and two "b" contacts mounted on each removable breaker element for Owner's use in external control circuits.
12. Secondary contacts made in test position to eliminate need of jumper cable.
13. Key interlocks coordinated with other equipment as indicated.
14. All breakers completely interchangeable with those of same continuous current and short-circuit current ratings.

2.03 480-VOLT SWITCHGEAR: Switchgear shall be designed and constructed to conform to applicable standards and the following requirements:

A. Ratings under altitude and ambient temperature conditions specified:
1. 600 volts AC, suitable for operation on a high-resistance grounded system rated 480-Volts, 3 phase, 3 wire, 60 hertz.
2. Main bus continuous current rating as indicated on one line diagram.
3. Vertical buses for connection to feeder breakers shall have a continuous current rating equal to the main horizontal bus rating.
4. Vertical buses for bus duct connections shall be rated the same as connecting bus duct.
5. Mechanically and thermally capable of withstanding without damage short-circuit stresses corresponding to the symmetrical short-circuit ratings indicated.

B. Type and Design:
1. Indoor metal-enclosed, drawout type.
2. Arrangement shall be as indicated.
3. Switchgear shall be arc-resistant, Type 2B as defined in IEEE C37.20.7 as protecting:
a. The front.
b. The sides.
c. The back.
d. All low voltage and instrument compartments.
4. Arc resistant switchgear shall be designed to withstand the pressure wave and not permit burn through of the walls, or doors for minimum arc duration of 10 cycles. The arc-resistant switchgear shall be designed to minimize the spread of internal arcing faults and to provide protection to operating personnel by containing the arc byproducts and venting the gases in a safe controlled manner.

5. Design shall be such that in case of an internal arc fault, all related exterior vents shall automatically close and pressure shall be directed into arc flash plenum and duct to exhaust gases to exterior of building.
6. If required, bid shall include a minimum of 10 linear feet of arc exhaust duct and any required fittings. Duct shall be steel and have same exterior finish and paint as other switchgear equipment.
7. If arc exhaust duct is furnished, furnish arc exhaust duct hoods at exterior of building with integral dampers to allow for exhausting of arc flash while preventing outdoor elements from entering duct. Hoods shall be steel and have same exterior finish and paint as other switchgear equipment.
8. Front hinged doors and removable bolted-on rear panels. Hinged doors shall close completely when the breaker is in the "disconnected" position.
9. Removable rear covers to permit access to power connections and bus.
10. Ground bus with short-time rating corresponding to the symmetrical short-circuit ratings indicated extending the full length of the switchgear with 250-kcmil lugs for ground cable connection at each end of each assembly. Connections to the ground bus shall not be coincident with the support bolts or splice joints. Ground each unit housing to this bus as well as each circuit breaker when in connected or test positions.
11. Neutral Grounding Resistors:
    a. Furnish high-resistance grounding resistors ~~integral to switchgear lineup for~~in stand-alone enclosures for each main breaker as indicated on one line diagram.
    b. Limit ground fault current to 5 amperes.
    c. Shall include 59N relay with adjustable setpoints and a minimum of two, normally open contacts for alarm.
    d. Ground fault indicating light.
    e. Normal operation indicating light.
    f. Local alarm reset.
    g. Ground voltmeter.
12. All breaker compartments shall be complete with rails, guides, interlocks, primary and secondary disconnecting devices, and all other features as required for installation of a breaker to serve a circuit by connection of power cables to rear load terminals and connection of control cables to terminal blocks.
13. Termination equipment:
    a. Furnish metal-enclosed bus duct entrance connections as indicated. Include means for termination of the metal-enclosed bus duct enclosure or ground bus on the switchgear ground bus. Bus duct shall not be supported by current carrying conductors. All required transpositions shall be made in the switchgear.
    b. Furnish tying bars for support of insulated copper power cable entering from above or below in all units where bus duct is not indicated.
    c. Cable terminals shall be silver-plated or tin-plated copper NEMA 2-hole pads in sufficient quantity for the incoming cables, but not less than two.
    d. Cable terminals shall be isolated from the main bus. This may be achieved by Owner-approved barriers between the terminals and the main bus or by an insulated main bus system.
14. Furnish an isolated compartment for the control wiring.
15. Furnish all auxiliary compartments required, and spare compartments where indicated.
16. Switchgear bus phase sequence shall be clearly identified in the main breaker cubicle as 1-2-3 in conformance with IEEE C37.20.1, Article 7.1.1.1.
17. Furnish load center space heaters and space heater power supplies as follows:

a. Furnish 240VAC-rated thermostatically controlled space heaters in each vertical section as required to prevent condensation. Apply space heaters at one-half rated voltage.
b. Owner will furnish one 120 volt ac, single-phase, 2-wire power supply to the lineup. This main supply shall be protected by a Supplier-furnished main circuit breaker.
c. Supplier shall furnish all branch circuit protection and interconnecting wiring such that the switchgear space heaters from each line-up of switchgear shall be supplied from the single power supply.

18. Terminal Blocks:
    a. Wire all spare contacts from breaker auxiliary switches and lockout relays to external connection terminal blocks.
    b. Terminal blocks for external connection shall include not less than 10 spare grouped terminals for each breaker. Spare terminals shall have no connections or designated field or future connections.
    c. Each terminal block, conductor, relay, circuit breaker, fuse block, and other auxiliary devices and terminals shall be permanently labeled to coincide with the identification indicated on the drawings.
19. Provide engraved laminated plastic nameplates with white background and black core for each major piece of Equipment, each instrument and each control device mounted on the Equipment as described in Section 260002.
20. Provide 3/8” wide red plastic strip showing mimic bus, circuit breakers, and voltage transformers.
21. Furnish IR windows on rear of each vertical section of switchgear as required to enable thermography monitoring of power connections without having to open switchgear.
22. Switchgear lineup shall be furnished with a top-mounted travelling breaker lift device for removing and replacing circuit breakers. Lift device shall not interfere with entrance of conduits or bus duct.

C. Instrument Transformers, Instruments, Relays, Meters, Switches, and Other Control Devices:
1. Furnish all instrument transformers as indicated. Instrument transformers shall conform to applicable standards, and shall have suitable mechanical, thermal, and accuracy ratings as indicated on drawings. Wire potential transformers to a set of terminal blocks for easy external connection. Potential transformers shall have a minimum rating of 500 VA at 30-degree C ambient, with metering accuracy classification of 0.3W, X, Y, Z, and M at all burdens up to the thermal rating of the transformer.
2. Circuit breakers connected to potential transformer secondaries shall each have at least one (1) form C auxiliary status contact wired out to external terminal blocks.
3. Include all instruments, relays, meters, switches, and other devices specified and indicated as located at the switchgear. Specific types shall be as indicated on one line diagram. Specific types shall be as indicated in Table 2 at the end of this Section.
4. Manufacturers for protective relays shall be as shown on drawings.
5. Indicating lights shall be General Electric type ET16 with LED lamp or Engineer-approved equal.
6. All solid-state equipment shall be designed to withstand the surge withstand capability (SWC) test of IEEE C37.90.
7. Furnish type FT-1 test switches located on the front of the switchgear as indicated on drawings.
8. Ammeter switches shall have the neutral made up outside the switch to permit extension of the CT circuit.

D. Control Arrangement:

1. General Control Items and Features: Include the following:
   a. All electrically operated breakers shall operate as indicated on the control schemes provided.
   b. Provide one 10,000-AIC molded-case circuit breaker in each switchgear assembly for connection of the switchgear 125-volt dc control power bus to an external supply circuit. Provide 125-volt dc alarm relay connected across 125-volt dc bus of each switchgear assembly with contact to close on loss of dc, wired out for remote alarm.
   c. Two sets of control power circuit breakers for each electrically operated breaker. Electrical control scheme shall be similar to IEEE C37.11, Figure 1, Diagram B, 2, with the trip and close circuits individually protected. Provide additional control power circuit breakers for other control circuits such as relay circuits as indicated.
   d. One or more 125-volt DC main breaker(s) to accept Owner's 125-volt DC connection(s).
   e. Mechanism operated switches (52MOC as devined in C37.20.1, Article 7.1.3.4) for each breaker. 4 N.O. and 4 N.C. contacts shall be available for external use over and above those required for switchgear internal control functions.
   f. Removable element position switches (52TOC as defined in IEEE C37.20.1, Article 7.1.3.4) for each breaker as indicated.
   g. Provide a blue supervise and amber trip light for each lockout relay. Provide contacts on lockout relays to operate these lights and perform tripping and alarm functions indicated.
   h. The main and tie breakers shall have zone selective interlocking with feeder breakers for phase and ground fault current trip functions.
   i. The main and feeder breakers shall have arc flash reduction maintenance system (ARMS) incorporated in the switchgear.
   j. Each breaker shall include control switches (CS) and indicating lights (GE type ET16 or equal) as shown in control schematics provided.
2. Breaker Control Schemes: Schematic diagrams shall be prepared by Supplier in accordance with the typical control schemes indicated.

E. Alarms: Include remote alarms as indicated on the typical schemes.
   1. Provide a single bell alarm point actuated by overcurrent on any trip unit. This point shall be in addition to the overcurrent trip alarm for each breaker. Breaker shall not be able to close after the bell alarm has operated until the bell alarm has been manually reset.
   2. Wire out alarms from multifunction relays to external terminal blocks for Owner use as shown on control schemes.

2.04 MAINTENANCE EQUIPMENT AND SPARE PARTS:

A. Furnish the following:
   1. One set of ~~special wrenches,~~ removable hand cranks for breaker rack-out and manual spring recharge, maintenance slow closing devices, and breaker lifting spreader for each type of breaker furnished.
   2. Two sets of test plugs for meters, relays, and test switches.
   3. Six spare primary fuses of each voltage and current rating used in the switchgear.
   4. Six spare secondary fuses of each voltage and current rating used in the switchgear.
   5. Four spare indicating lamps of each type.
   6. Four spare indicating lamp resistors of each type.
   7. Two spare indicating lamp color caps of each type and color.

8. Two complete sets of breaker operating coils as required for all frame sizes furnished.
9. One portable test set for testing and field calibration of microprocessor tripping devices.
10. Two breaker element mounted auxiliary switches (52) of each type required.
11. Two breaker position switches (52H) of each type required.
12. Other parts normally furnished by manufacturer.

PART 3 - EXECUTION

3.01 FACTORY TESTS:

A. Perform manufacturer's standard tests and tests as specified in this Section, Item 1.04.
B. Owner will perform other field testing under a separate contract.

3.02 FIELD SERVICES:

A. Bid Price shall include five man-days and one round trip to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.
B. Manufacturer's field representative shall assist installing contractor with assembly and installation of switchgear per Supplier's installation and operation and maintenance manuals.
   1. Inspection of switchgear for damage during shipment and installation.
   2. Makeup of shipping split wiring connections.
   3. Makeup of shipping split bus and enclosure connections.
   4. Verification of final setting of the switchgear lineup per Supplier's requirements.
   5. Coordinate and make installing contractor aware of any additional installation requirements.

Table 1

Device	Manufacturer	Type	Substitute
(1) Lockout Relays	Electroswitch	Type 24 LOR	No
(2) Indicating Lights	General Electric	ET-16 LED Cat. #116B96708 G43	Or Equal
(3) Auxiliary Transformer Protection Relay	Schweitzer	587 Part # 0587006X131	No
(4) Auxiliary Generator Protection Relay	Schweitzer	547 Part # 05470X155XXX2XX	No
(5) Synchronization Check Relay	Basler	BE3-25 Part # BE3-25-1-D-1-N-5	No
(6) Ammeter/Voltmeters	Yokogawa	AB40	Or Equal

END OF SECTION 262300

DOCUMENT 009103 - ADDENDUM NO. 3

Issued to all Bidders:

Date: February 5, 2015

Contract Name: 13,800-Volt and 480-Volt Switchgear

SUA Bid No.: #21-14/15

This addendum forms a part of the Bid described above. The original Contract documents and any prior addenda remain in full force and effect except as modified by the following which shall take precedence over any contrary provisions in the prior documents.

Each Bidder shall acknowledge receipt of this addendum by affixing signature below, by noting this addendum on Bidder's Bid Form, and by attaching this addendum to the Bid.

ACKNOWLEDGEMENT

The undersigned acknowledges receipt of this addendum and the Bid submitted is in accordance with information, instructions, and stipulations set forth herein.

Bidder: _____

By: Powell Electrical Systems Inc.

Date: 2/13/2015

SUMMARY BID FORM:

1. See the revised document included with this addendum "SUA Bid #21-14/15 Summary Bid Form C5310 – 13,800-Volt and 480-Volt Switchgear."

BIDDER QUESTIONS AND ANSWERS:

1. See the document included with this addendum "SUA Bid 21-1415 Bidders Correspondence Log."

Summary Bid Form

SUA Bid #21-14/15

C5310 – 13,800-Volt and 480-Volt Switchgear

January 14, 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 #21-14/15** 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.	One (1) single-ended lineup of 13.8kV metalclad switchgear	$ 387,498.00
2.	One (1) main-tie-main lineup of 480-V metal-enclosed switchgear.	$ 394,648.00
3.	Transportation (DDP jobsite, Stillwater OK)	$ 4,000.00
	Sub-Total	$ 786,146.00
4.	Field Services as specified	$ 44,800.00
5.	Requested Performance and Statutory Bonds	$ 5,500.00
	BIDDER'S TOTAL PRICE	$ 836,446.00
A1	Option: Recommended Spare Parts for Commissioning	$ NONE
A2	Option: One (1) spare E800AF/800AT, 480V breaker	$ 6,152.00
A3	Option: One (1) spare E3200AF/3200AT, 480V breaker	$ 8,678.00
A4	Option: One (1) single-ended, two-section lineup of 13.8kV, 3000A metalclad switchgear consisting of the following: • One (1) outgoing breaker section matching same design, ratings, accessories, and	$ 851,276.00

	construction as 00EAP-BAO-901. • One (1) incoming section capable of accommodating top-entry 3000A non-segregated phase bus duct connection to the lineup's bus. Instrumentation in vertical section includes single-phase 120:1 PT for connection to line side of the adjacent outgoing breaker.	124,346.00
A5	Option: One (1) vertical section and included breaker matching the same design, ratings, accessories, and construction as 00EAP-BAO-901, but will functionally serve as a tie breaker between 00-EAP-SWG-001 and option A~~12~~ above. Exclude only SEL-587Z, 86B1 accessories.	$ 61,249.00
A6	Option: One (1) spare 1200A, 13.8kV generator breaker	$ 12,025.00

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#21-14/15. 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 #21-14/15 *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.	One (1) single-ended lineup of 13.8kV Metalclad switchgear	$ 387,498.00
C2.	One (1) main-tie-main lineup of 480-V Metal-enclosed switchgear. Coffeeville,KS	$ 394,648.00
C3.	Transportation (DDP jobsite, Stillwater OK)	$ 4,225.00
	Sub-Total	$ 786,371.00
C4.	Field Services for inspection, start-up, and commissioning	$ 44,800.00
C5.	Requested Performance and Statutory Bonds	$ 5,500.00
	BIDDER'S TOTAL PRICE	$ 836,671.00
C6.	Option: Recommended Spare Parts for Commissioning	$ None
C7.	Option: 50% of deduct for duplicate order	$ (3,910.00)
C8.	Option: Spare E800AF/800AT, 480V breaker	$ 6,152.00
C9.	Option: Spare E3200AF/3200AT, 480V breaker	$ 8,678.00
	BIDDER'S OPTION TOTAL PRICE FOR COFFEYVILLE	**$** 847,591.00

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 C7 above. If there are no savings, enter zero in A2 below and C7 above.

No.	Description	Fill in Deduct
A2.	Option: 50% of deduct for Stillwater Utilities Authority Items No. 1-2	$ (3,910.00)

The aforementioned option prices C1 through C7 & A2 are valid for 60 Days after contract award.

Data required with Bid:

No.	Description	Bidder Action
1.	Guaranteed Dates (*Commercial Terms and Conditions* Exhibit 1)	Review and confirm dates
2.	Milestone Payment & Cancellation Schedule (*Commercial Terms and Conditions* Exhibit 3)	Provide
3.	Submittals Schedule (Specifications SECTION 013301, Appendix A)	Provide data requested "With Bid"

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 0 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.	Please see "Powell Bid Summary Exceptions SUA Bid #21-14-15" attachment.
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

SIGNATURE REQUIRED ON NEXT PAGE

Powell Bid Summary Exceptions
SUA Bid #21-14-15

1. Documentation: Refer to our proposal for our standard offer
2. Shipping Schedule: Refer to Terms and Delivery in our offer
3. Liquidated Damages: Not accepted
4. Project execution requirements: Not accepted
5. Terms and Conditions:

   3(a) – warranty – delete the phrase "fit for the intended purpose" in the first line.

   3(b) – warranty is 18 months from delivery.

   4(d) – aggregate LDs up to 10%. Should be no more than 4% or 5%.

   5(a) – add the phrase "With reasonable written notice" to the beginning of the sentence.

   15(a) – add "under this Contract" after the word "Supplier" in the first line.

   17(c) – change "the Owner" in the 2nd line to "either party". Add the following: "Furthermore, under no circumstances shall Supplier's overall liability hereunder exceed the price of the goods or services which give rise to the claim."

Submitted By:

Bidder: Alex Fleishman

Company: Powell Electrical Systems Inc.

Address: 8550 Mosley Rd Houston, Texas 77075

E-Mail Address: alejandro.fleishman @ powellind.com

Phone: 713-948-4955 Fax 713-947-4453

Authorized Signature:

Date: 02/13/2015

SUA Bid #21-14/15 - CS310 - 13,800-Volt And 480-Volt Switchgear
Bidder's Correspondence Log

Item	Category	Date Rcv'd	RFP Section	Technical Exception, Clarification or Question	Resp. Initials	SUA Response	Response Date	Bidder Reply	Response Date	SUA Response	Response Date
1	Question	21-Jan-2014	Attachment B	I am going through the Spec and associated documents for the RFP and noticed that there are instructions to submit the bid online with Burns and McDonnell. Is this to be done in conjunction with our hard copy bid to Stillwater Electric Utility Administration Office? It looks like of the 268 pages page 75 - page 84 are instructions to log in to http://webtools.burnsmcd.com and the vendor submittal reference document.	CG	An additional bid is not required to be submitted via Burns & McDonnell webtools. Specification Section 013301 Appendix 5 outlines the procedure for sending technical submittals after the contract has been signed, not the bid process.	21-Jan-2014				
2	Question	20-Jan-2014	Attachment B	Please advise if generator paralleling controls need to be included in the 13,800 volt switchgear.	RAE	All paralleling controls for generation will be performed by a separate external system. No additional internal generator paralleling means required.	21-Jan-2014				
3	Question	19-Jan-2014	Attachment B	We are in receipt of the MV Switchgear RFQ involving the City of Stillwater Project. The Generators on the project are quite large (20MW each). We wants to make sure the switchgear is properly sized for the application. Attached is a check list which we are asking be completed regarding the information needed on the generator.	RAE	The applicable values for generator and transformer are as follows: Rated Voltage (V) = **13.8 kV** Rated Apparent Power (S) = **22.069 MVA** Saturated Subtransient Direct-axis Reactance (Xd") = **19.9%** Subtransient short-circuit time constant ("d") = **38.18 ms** Subtransient Open-circuit Time Constant: (T"do) = **65.21 ms** Maximum GSU let-through fault current (at bus) = **22 kA** GSU transformer X/R ratio (estimated) = **29.5**	22-Jan-2015				
4	Question	22-Jan-2015	Attachment B	Per the LV E-line, who is supplying the substation transformers and bus duct? Will that be awarded under a separate bid?	RAE	Transformers and bus duct are being furnished under a separate contract.	22-Jan-2015				
5	Question	22-Jan-2015	Attachment B	Per the MV E-line, who is supplying the non-seg bus? Will that be awarded under a separate bid?	RAE	Non-segregated phase bus duct is being furnished under a separate contract.	22-Jan-2015				
6	Question	22-Jan-2015	Attachment B	Per the MV E-line, who is supplying the gen controls? Those are supplied under a separate bid, correct?	RAE	Generator controls are being furnished under a separate contract.	22-Jan-2015				
7	Question	30-Jan-2015	N/A	I am writing to officially request inclusion of Schneider Electric in this public bid for the 480 volt and 13.8kV switchgear	RAE	Schneider Electric is deemed an acceptable bidder for this RFP.	3-Feb-2015				
8	Question	5-Feb-2015	Bid Form	In No. A5 (shown below) you reference "...,but will functionally serve as a tie breaker between 00-EAP-SWG-001 and option A2 above." We see this as a typo and believe it should read "option A4 above." Please confirm.	RAE	Confirmed. Reference in The item A5 should make reference to line item A4.	5-Feb-2015				

DOCUMENT 009101- ADDENDUM NO. 1

Issued to all Bidders:

Date: January 26, 2015

Contract Name: 13,800-Volt and 480-Volt Switchgear

SUA Bid No.: #21-14/15

This addendum forms a part of the Bid described above. The original Contract documents and any prior addenda remain in full force and effect except as modified by the following which shall take precedence over any contrary provisions in the prior documents.

Each Bidder shall acknowledge receipt of this addendum by affixing signature below, by noting this addendum on Bidder's Bid Form, and by attaching this addendum to the Bid.

ACKNOWLEDGEMENT

The undersigned acknowledges receipt of this addendum and the Bid submitted is in accordance with information, instructions, and stipulations set forth herein.

Bidder: _____

By: Powell Electrical Systems, Inc.

Date: 02/13/2015

DOCUMENT 009102 - ADDENDUM NO. 2

Issued to all Bidders:

Date: February 3, 2015

Contract Name: 13,800-Volt and 480-Volt Switchgear

SUA Bid No.: #21-14/15

This addendum forms a part of the Bid described above. The original Contract documents and any prior addenda remain in full force and effect except as modified by the following which shall take precedence over any contrary provisions in the prior documents.

Each Bidder shall acknowledge receipt of this addendum by affixing signature below, by noting this addendum on Bidder's Bid Form, and by attaching this addendum to the Bid.

ACKNOWLEDGEMENT

The undersigned acknowledges receipt of this addendum and the Bid submitted is in accordance with information, instructions, and stipulations set forth herein.

Bidder: _____

By: Powell Electrical Systems, Inc.

Date: 02/13/2015

DOCUMENT 009104 - ADDENDUM NO. 4

Issued to all Bidders:

Date: February 11, 2015

Contract Name: 13,800-Volt and 480-Volt Switchgear

SUA Bid No.: #21-14/15

This addendum forms a part of the Bid described above. The original Contract documents and any prior addenda remain in full force and effect except as modified by the following which shall take precedence over any contrary provisions in the prior documents.

Each Bidder shall acknowledge receipt of this addendum by affixing signature below, by noting this addendum on Bidder's Bid Form, and by attaching this addendum to the Bid.

ACKNOWLEDGEMENT

The undersigned acknowledges receipt of this addendum and the Bid submitted is in accordance with information, instructions, and stipulations set forth herein.

Bidder: _____

By: Powell Electrical Systems, Inc.

Date: 02/13/2015

POWELL

QUOTATION NO.: 212020
February 10, 2015

REFERENCE: SUA Power Generation Station Project
SEALED BID

Deputy City Clerk
City of Stillwater
723 S. Lewis Street
Stillwater, OK 74074-4652

Attn: Deputy City Clerk

We are pleased to offer the following proposal, which is our understanding of your requirements, subject to acceptance within 60 D days from the above date. Please advise us if there are any misunderstandings. This quotation is also subject to change upon notice.

Powell is pleased to submit the following equipment proposal for your review and consideration.

The Equipment Descriptions and Bills of Material presented represent our best understanding of your equipment requirements based on the specifications, one-line drawings, and data sheets provided with the inquiry package.

Please review the content of our proposal and advise any changes or additions required to meet your specific project needs. Pricing submitted is based on the Bills of Material and Equipment Descriptions listed within this proposal.

Thank you for the opportunity to earn your business and our Bill of Material and Pricing is as follows:

Powell Electrical Systems, Inc.
Powell Electrical Manufacturing
PO Box 12818 • Houston, TX • 77217

Powered by Safety®

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Tel: 713.944.6900 • Fax: 713.947.4453
Visit us at www.powellind.com
Email us at info@powellind.com

13.8kV Metal Clad Switchgear

One (1) line-up of PowlVac-AR® arc resistant metal clad switchgear with vacuum circuit breakers in accordance with ANSI standards C37.09, C37.20.2, C37.20.7, and rated as follows:

Maximum Voltage Class:	**15 kV**
Service Voltage:	**13.8 kV**
Basic Impulse Level:	**95 kV**
Power Frequency Withstand:	**36 kV**
Voltage Range (K factor):	**1**
Short-circuit Current Rating:	**50 kA rms**
Close and Latch Capacity:	**135 kA Peak**
Close Voltage:	**125 VDC**
Trip Voltage:	**125 VDC**
Frequency:	**60 Hz**

(6) Vertical sections of metal clad switchgear each with the following common features:

- Indoor enclosure, 11 gauge steel
- Basic **two high Type II** construction including arc resistant rear access door
- Laminated plastic mimic bus
- Top mounted plenum to vent the arc byproducts
- 3000A main bus, silver plated copper, 3 phase, 3 wire
- Flame retardant and track resistant Bonded Epoxy bus insulation system
- Epoxy main bus pass through insulators in a glass polyester mounting
- Carbon steel Grade 5 mounting hardware, plated for corrosion protection
- Phase polarity 1 2 3 or A B C, front to back, top to bottom, left to right
- 1/4" X 2" copper ground bus with plating to match main bus
- Control terminal blocks, 600 volt, 30 ampere
- Control wiring, 14 gauge, 41 strand, type SIS with VW-1 flame retardant rating
- Control wire termination, insulated, spade tongue, crimp type
- Current transformer shorting type terminal blocks
- Current transformer control wiring, 10 gauge, 105 strand, type SIS with VW-1flame retardant rating
- Current transformer terminations, insulated, ring tongue, crimp type
- Common DC bus #8 AWG SIS wire with seamless ring tongue terminations
- Laminated plastic device nameplates, stainless steel mounting screws
- Wire markers, sleeve type
- Enclosure space heater with expanded metal cage, rated 240VAC, energized @ 120VAC
- Glastic barrier behind the instrument compartment doors

- UL listed - AR Classified
- Texture powder coat paint finish
- ANSI-61, light gray exterior with white instrument panels

1 Space heater circuit with MCCB supply disconnect, thermostat and bypass switch
1 Provision for future expansion
2 Ground cable lugs (4/0)
1 Bus duct termination 3000A

(4) Sets incoming line voltage monitoring equipment, each to include:

1 Closed door racking type Roll-out assembly complete with primary & secondary fuses
1 Voltage transformer, 14400:120 volt

(1) Set switchgear main bus voltage monitoring equipment to include:

1 Closed door racking type roll-out assembly complete with primary & secondary fuses
1 Voltage transformer, 14400:120 volt

(1) MAIN circuit breaker equipment set to include:

1 Circuit breaker cell rated 3000 ampere with a single action (latch -unlatch), Arc Resistant door with, closed door racking provision, viewing window, integral light and remote switch, riser bus, cell studs, cycloaliphatic epoxy spouts, automatic isolating shutters, manual closed door trip unit, and cell interlocks as required by ANSI.
1 Silver plated copper runback bus assembly rated 3000A with boots
- Epoxy bus stand off assembly

1 4" Exiscan IR Window
1 **PowlVac drawout vacuum circuit breaker rated 15kV, 3000A, 50kA with closed door racking provision 15PV50, with 2 "a" & 2 "b" contacts**
1 Circuit breaker open/close control switch
6 Status indicating lights LED type (2 for breakers, and 4 for lockout relays)
1 Circuit breaker switch, MOC 9 circuit (5 a & 4 b)
1 Circuit breaker switch, TOC 9 circuit (5 a & 4 b)
1 Circuit breaker female connector for remote control
1 Circuit breaker shutter position indicator
1 Closed door racking to include viewing window, light 120 VAC LED type with switch
1 Emergency push to trip switch with protective cover
1 Door provision for electrical racking device

1 Set close circuit disconnect fuse block with fuses
1 Set trip circuit disconnect fuse block with solid link
12 Current transformers, single ratio, standard burden
1 SEL-751A Feeder Protection Relay 751A51A1A1A76850810
1 SEL-587Z High-Impedance Differential Relay 0587Z0X615312XX
1 Device 59N, Ground Fault Overvoltage Relay, **Basler** BE1-59N A5EE1JC0N1F Sensing Input Type: Single Phase Voltage Sensing Input Range: 240Vac, 60Hz
2 Device 27DC, Diversified Electronics part number UOA110-DLA
3 DC breaker (GE TEB)
4 FT1 Test switch, 10 pole Current or Potential as required
2 Device 86, lockout relay, **Electroswitch** LOR-1, 20 contacts (Five Decks) part no. 7805D
3 Intermediate Class Surge Arresters, 9 kV, polymer
1 Lot nameplates

(1) FEEDER (to 480V main CT) circuit breaker equipment set to include:

1 Circuit breaker cell rated 1200 ampere with a single action (latch -unlatch), Arc Resistant door with, closed door racking provision, viewing window, integral light and remote switch, riser bus, cell studs, cycloaliphatic epoxy spouts, automatic isolating shutters, manual closed door
trip unit, and cell interlocks as required by ANSI.
1 Silver plated copper runback bus assembly rated 1200A with boots
• Epoxy bus stand off assembly
1 4" Exiscan IR Window
1 **PowlVac drawout vacuum circuit breaker rated 15kV, 1200A, 50kA with closed door racking provision 15PV50, with 2 "a" & 2 "b" contacts**
1 Circuit breaker open/close control switch
4 Status indicating lights LED type (2 for breakers, and 2 for lockout relay)
1 Circuit breaker switch, MOC 9 circuit (5 a & 4 b)
1 Circuit breaker switch, TOC 9 circuit (5 a & 4 b)
1 Circuit breaker female connector for remote control
1 Circuit breaker shutter position indicator
1 Closed door racking to include viewing window, light 120 VAC LED type with switch
1 Emergency push to trip switch with protective cover
1 Door provision for electrical racking device
1 Set close circuit disconnect fuse block with fuses
1 Set trip circuit disconnect fuse block with solid link
9 Current transformers, single ratio, standard burden
1 Zero sequence current transformer, 50:5, ITI 143
1 SEL-787 Transformer Protection Relay 0787EX1ACACA75850830

2 Device 27DC, Diversified Electronics part number UOA110-DLA
3 DC breaker (GE TEB)
2 FT1 Test switch, 10 pole Current or Potential as required
1 Device 86, lockout relay, **Electroswitch** LOR-1, 20 contacts (Five Decks) part no. 7805D
3 Intermediate Class Surge Arresters, 9 kV, polymer
1 Lot nameplates

(1) FEEDER (to 480V main CT) circuit breaker equipment set to include:

1 Circuit breaker cell rated 1200 ampere with a single action (latch -unlatch), Arc Resistant door with, closed door racking provision, viewing window, integral light and remote switch, riser bus, cell studs, cycloaliphatic epoxy spouts, automatic isolating shutters, manual closed door trip unit, and cell interlocks as required by ANSI.
1 Silver plated copper runback bus assembly rated 1200A with boots
• Epoxy bus stand off assembly
1 4" Exiscan IR Window
1 **PowlVac drawout vacuum circuit breaker rated 15kV, 1200A, 50kA with closed door racking provision 15PV50, with 2 "a" & 2 "b" contacts**
1 Circuit breaker open/close control switch
4 Status indicating lights LED type (2 for breakers, and 2 for lockout relay)
1 Circuit breaker switch, MOC 9 circuit (5 a & 4 b)
1 Circuit breaker switch, TOC 9 circuit (5 a & 4 b)
1 Circuit breaker female connector for remote control
1 Circuit breaker shutter position indicator
1 Closed door racking to include viewing window, light 120 VAC LED type with switch
1 Emergency push to trip switch with protective cover
1 Door provision for electrical racking device
1 Set close circuit disconnect fuse block with fuses
1 Set trip circuit disconnect fuse block with solid link
9 Current transformers, single ratio, standard burden
1 Zero sequence current transformer, 50:5, ITI 143
3 Fused Voltage Transformers, 460-120 type
1 SEL-787 Transformer Protection Relay 0787EX1ACACA75850830
2 Device 27DC, Diversified Electronics part number UOA110-DLA
3 DC breaker (GE TEB)
2 FT1 Test switch, 10 pole Current or Potential as required
1 Device 59N, Ground Fault Overvoltage Relay, **Basler** BE1-59N A7EE1JC0N1F Sensing Input Type: Single Phase Voltage Sensing Input Range: 240Vac, 60Hz

1 Device 86, lockout relay, **Electroswitch** LOR-1, 20 contacts (Five Decks) part no. 7805D
3 Intermediate Class Surge Arresters, 9 kV, polymer
1 Lot nameplates

(3) FEEDER (to generator) circuit breaker equipment sets, each to include:

1 Circuit breaker cell rated 1200 ampere with a single action (latch -unlatch), Arc Resistant door with, closed door racking provision, viewing window, integral light and remote switch, riser bus, cell studs, cycloaliphatic epoxy spouts, automatic isolating shutters, manual closed door
trip unit, and cell interlocks as required by ANSI.
1 Silver plated copper runback bus assembly rated 1200A with boots
• Epoxy bus stand off assembly
1 4" Exiscan IR Window
1 PowlVac drawout vacuum circuit breaker rated 15kV, 1200A, 50kA with closed door racking provision 15PV50, with 2 "a" & 2 "b" contacts
1 Circuit breaker open/close control switch
4 Status indicating lights LED type (2 for breakers, and 2 for lockout relay)
1 Circuit breaker switch, MOC 9 circuit (5 a & 4 b)
1 Circuit breaker switch, TOC 9 circuit (5 a & 4 b)
1 Circuit breaker female connector for remote control
1 Circuit breaker shutter position indicator
1 Closed door racking to include viewing window, light 120 VAC LED type with switch
1 Emergency push to trip switch with protective cover +
1 Door provision for electrical racking device
1 Set close circuit disconnect fuse block with fuses
1 Set trip circuit disconnect fuse block with solid link
12 Current transformers, single ratio, standard burden
1 Zero sequence current transformer, 50:5, ITI 143
1 SEL-735 Power Quality & Revenue Meter 0735VX00944CXXA4XX16201XX
2 Device 27DC, Diversified Electronics part number UOA110-DLA
3 DC breaker (GE TEB)
1 FT1 Test switch, 10 pole Current or Potential as required
1 Device 86, lockout relay, **Electroswitch** LOR-1, 20 contacts (Five Decks) part no. 7805D
3 Intermediate Class Surge Arresters, 9 kV, polymer
1 Lot nameplates

(1) Set of switchgear accessories to include:

1 Manual charging handle
1 Circuit breaker racking handle
1 Circuit breaker test cabinet with test coupler
1 Interlock override
1 VT rollout assembly racking handle
1 Remote control station with 30' cord
1 Circuit breaker lift truck
2 Set test plug for meters, relay, and test switches
1 SPARE PowlVac drawout vacuum circuit breaker rated 15kV, 3000A, 50kA with closed door racking provision 15PV50, with 2 "a" & 2 "b" contacts

1 15kV manually operated ground and test device basic unit only
Note: In order to insert a G&T device in AR cell the door must be open.

480V Arc Resistant Switchgear
Tag Number: 480V Switchgear

One (1) ANSI Type 2B, Arc Resistant, 600V class, drawout air circuit breaker switchgear assembly designed in accordance with ANSI standards and to be rated as follows:

Nominal RMS Voltage:	**480 V**
Interrupting Rating:	**65 kAIC RMS sym.**
Close Voltage:	**125VDC**
Trip Voltage:	**125 VDC**

(6) Switchgear sections each with the following common features:

- Indoor NEMA 1 enclosure with rear hinged doors
- **ANSI/IEEE C37.20.7 Arc-Resistant TYPE 2B construction**
- 1/4" X 2" copper ground bus with plating to match main bus
- Silver or Tin plating of ground bus
- Barriers between sections
- Barriers between Bus and Cable Compartment
- Top mounted plenum to vent the arc byproducts
- **Main bus, Silver plated copper, mounted on glass polyester supports rated:**

5 4" Exiscan IR Window
3 phase, 3 Wire 3200 Amp (24" WIDE)
3 phase, 3 Wire 3200 Amp (34" WIDE)

- Silver plated Copper vertical bus connection to main bus rated 3200A
- Bonded Epoxy bus insulation with vinyl boot covers for bolted bus joints
- Grade 5 Zinc plated bus hardware
- Control wiring, 14 gauge, 41 strand, type SIS with VW-1 flame rating
- Control wiring terminations, insulated, locking fork tongue, crimp type
- Control wiring terminals, 600 volt, 30 amps
- Current transformer control wiring, 10 gauge, 105 strand, type SIS with VW-1 flame retardant rating
- Current transformer control wiring terminations, insulated, ring tongue, crimp type
- Current transformer shorting terminals
- Color coded CT circuit (Yellow, Red or Black)
- Common DC bus #8 AWG SIS wire with ring tongue terminations
- Wiremarkers, sleeve type
- Laminated plastic device nameplates with stainless steel mounting screws
- Laminated plastic mimic bus, 3/8" red
- Enclosure space heater with expanded metal cage, rated 240VAC, energized @ 120VAC
- UL 1558 label

- Electrostatically applied, thermally set, polyester powder coat paint finish
- Exterior finish of textured ANSI 61 Gray
- Interior finish of ANSI 61 Gray with White Interior Sub Panels
- Glastic Insulating Barrier behind the instrument compartment devices

1 Space heater circuit with MCCB supply disconnect, thermostat and bypass switch
3 Bus Duct Risers 3200A, 3 phase 3 wire
2 Cable lugs for Ground Bus

(2) Main (From 13.8kV SWGR) Circuit breaker equipment sets, each to include:

1 Circuit breaker cell & rail assembly 3200A
1 Silver plated copper runback bus assembly 3200A
1 **Drawout Air Type Circuit Breaker, Magnum DS, MDS-632, 3200AF, electrically operated with solid state trip unit to include L/S/I trip functions, and rated for 65kAIC interrupting to include:**
- Digitrip 1150 Trip Unit w/ ARMs
- Electric motor operator
- Rating Plug
- Auxiliary switch (6a & 6b)
- Shunt Trip
- Spring Release
- Bell alarm (overcurrent trip switch)
- Operations Counter

1 Set Stab Isolation Shutters, 3200A-4000A
1 Cell Position Switch, (TOC), 4a & 4b contacts
3 Current Transformers, single-ratio, standard burden design
1 Fused Voltage Transformers, 460 type
1 Device 25, **Sync-Check** Relay, BE3-25 Part # BE3-25-1-D-1-N-5
1 **Yokogawa** Voltmeter AB40 Type
2 DC breaker (Trip & Close)
2 Device 27DC, Diversified Electronics part number UOA110-DLA
1 Set control circuit fusing
1 Circuit breaker control switch
3 Indicating lights, LED type
1 Connector for hand held remote control station
1 Lot of Nameplates

(1) Main (From 12.47kV Circuit) Circuit breaker equipment set to include:

1 Circuit breaker cell & rail assembly 3200A
1 Silver plated copper runback bus assembly 3200A
1 **Drawout Air Type Circuit Breaker, Magnum DS, MDS-632, 3200AF, electrically operated with solid state trip unit to include L/S/I trip functions, and rated for 65kAIC interrupting to include:**
- Digitrip 1150 Trip Unit w/ ARMs
- Electric motor operator
- Rating Plug
- Auxiliary switch (6a & 6b)
- Shunt Trip
- Spring Release
- Bell alarm (overcurrent trip switch)
- Operations Counter

1 Set Stab Isolation Shutters, 3200A-4000A
1 Cell Position Switch, (TOC), 4a & 4b contacts
3 Current Transformers, single-ratio, standard burden design
1 Fused Voltage Transformers, 460 type
1 Device 25, **Sync-Check** Relay, BE3-25 Part # BE3-25-1-D-1-N-5
1 SEL-587 Current Differential Relay 0587006X131
2 FT1 Test switch, 10 pole Current or Potential as required
1 **Yokogawa** Voltmeter AB40 Type
1 Device 86, lockout relay, **Electroswitch** LOR-1, 20 contacts (Five Decks) part no. 7805D
1 Device 27DC, Diversified Electronics part number UOA110-DLA
2 DC breaker (Trip & Close)
1 Set control circuit fusing
1 Circuit breaker control switch
4 Indicating lights, LED type (1 blue supervise and amber trip lights for lockout relay)
1 Connector for hand held remote control station
1 Lot of Nameplates

(1) Tie Circuit breaker equipment set, to include:

1 Circuit breaker cell & rail assembly 3200A
1 Silver plated copper tie bus assembly 3200A
1 **Drawout Air Type Circuit Breaker, Magnum DS, MDS-632, 3200AF, electrically operated with solid state trip unit to include L/S/I trip functions, and rated for 65kAIC interrupting to include:**
- Digitrip 1150 Trip Unit w/ ARMs
- Electric motor operator

- Auxiliary switch (2a & 2b)
- Auxiliary switch (6a & 6b)
- Shunt Trip
- Spring Release
- Bell alarm (overcurrent trip switch)
- Operations Counter

1 Set Stab Isolation Shutters, 800A-2000A
1 Cell Position Switch, (TOC), 4a & 4b contacts
1 Device 25, **Sync-Check** Relay, BE3-25 Part # BE3-25-1-D-1-N-5
3 Current Transformers, single ratio, standard burden design, metering class
2 **Yokogawa** Voltmeter AB40 Type
6 Fused Voltage Transformers, 500VA, 450 type for customer revenue meter (3) for bus 11 and (3) for bus 12.
2 Fused Voltage Transformers, 460 type
1 Automatic Transfer Scheme by utilizing discrete relays
1 Power Xpert Gateway 6000E
1 Device 27DC, Diversified Electronics part number UOA110-DLA
2 DC breaker (Trip & Close)
1 Set control circuit fusing
1 Circuit breaker control switch
2 Indicating lights, LED type
1 Connector for hand held remote control station
1 Lot of Nameplates

(1) Feeder Circuit breaker equipment sets, each to include:

1 Circuit breaker cell & rail assembly 800A-2000A
1 Silver plated copper runback bus assembly 1600A
1 **Drawout Air Type Circuit Breaker, Magnum DS, MDS-616, 1600AF, electrically operated with solid state trip unit to include L/S/I trip functions, and rated for 65kAIC interrupting to include:**

- Digitrip 1150 Trip Unit w/ ARMs
- Electric motor operator
- Rating Plug
- Auxiliary switch (6a & 6b)
- Shunt Trip
- Spring Release
- Bell alarm (overcurrent trip switch)
- Operations Counter

1 Set Stab Isolation Shutters, 800A-2000A
1 Cell Position Switch, (TOC), 4a & 4b contacts
1 Set control circuit fusing

1 Device 27DC, Diversified Electronics part number UOA110-DLA
2 DC breaker (Trip & Close)
1 Circuit breaker control switch
2 Indicating lights, LED type
1 Lot of Nameplates
1 Set Power Cable Lugs
1 Set Insulating Boots

(1) Feeder Circuit breaker equipment set to include:

1 Circuit breaker cell & rail assembly 800A-2000A
1 Silver plated copper runback bus assembly 800A
1 **Drawout Air Type Circuit Breaker, Magnum DS, MDS-608, 800AF, electrically operated with solid state trip unit to include L/S/I trip functions, and rated for 65kAIC interrupting to include:**
- Digitrip 1150 Trip Unit w/ ARMs
- Electric motor operator
- Rating Plug
- Auxiliary switch (6a & 6b)
- Shunt Trip
- Spring Release
- Bell alarm (overcurrent trip switch)
- Operations Counter

1 Set Stab Isolation Shutters, 800A-2000A
1 Cell Position Switch, (TOC), 4a & 4b contacts
1 Current Transformers, single-ratio, standard burden design
1 Set control circuit fusing
1 Circuit breaker control switch
4 Indicating lights, LED type (1 blue supervise and amber trip lights for lockout relay)
1 Lot of Nameplates
1 Device 86, lockout relay, **Electroswitch** LOR-1, 20 contacts (Five Decks) part no. 7805D
1 SEL-547 Distributed Generator Interconnection Relay #05470X155XXX2XX
2 FT1 Test switch, 10 pole Current or Potential as required
1 Device 27DC, Diversified Electronics part number UOA110-DLA
2 DC breaker (Trip & Close)
2 Indicating lights, LED type
1 Set Power Cable Lugs
1 Set Insulating Boots

(4) Feeder Circuit breaker equipment sets, each to include:

1 Circuit breaker cell & rail assembly 800A-2000A
1 Silver plated copper runback bus assembly 800A
1 **Drawout Air Type Circuit Breaker, Magnum DS, MDS-608, 800AF, electrically operated with solid state trip unit to include L/S/I trip functions, and rated for 65kAIC interrupting to include:**
- Digitrip 1150 Trip Unit w/ ARMs
- Electric motor operator
- Rating Plug
- Auxiliary switch (6a & 6b)
- Shunt Trip
- Spring Release
- Bell alarm (overcurrent trip switch)
- Operations Counter

1 Set Stab Isolation Shutters, 800A-2000A
1 Cell Position Switch, (TOC), 4a & 4b contacts
3 Current Transformers, single-ratio, standard burden design, metering class
1 Set control circuit fusing
1 Circuit breaker control switch
2 Indicating lights, LED type
1 Device 27DC, Diversified Electronics part number UOA110-DLA
2 DC breaker (Trip & Close)
1 Lot of Nameplates
1 Set Power Cable Lugs
1 Set Insulating Boots

(3) Powell Ground Protect Plus HRG designed for use on a 480 volt WYE system with neutral available. Each unit to include:

1 Fused disconnect switch, 5 pole
1 Neutral current transformer and sensing resistor
1 Neutral ground resistor. Available taps 2,3,4,5,6,8,& 10 amps
1 Electronic Pulsing Module and controller
1 Ground fault red indicating light LED type
1 Normal green indicating light LED type
1 Pulsing yellow indicating light LED type
1 Alarm horn
1 Powell GroundGard digital interface to include the following:
- Alarm View, Acknowledge and Clear Push-Buttons
- System Test Button. System Reset Push-Button

- System Reset Push-Button
- Lamp Test Feature to verify three lights listed above are functional
- Pulse on/off push-button
- Menu, Edit, Escape and Enter buttons
- Software to Data Log/Trend system conditions
- Communications port (RJ-45)

1 Door mounted, operating instruction label

1 Portable Clamp-on Ground detector
1 Test resistor

(1) Set of standard switchgear accessories to include:

1 Circuit breaker racking handle
1 Lifting yoke
1 Overhead Lifting Device
2 Sets test plug for meters, relays, and test switch
1 Portable Digitrip Test kit

(0.6kV 3200A)
Non-Segregated Phase Bus Duct
Tag Nos. BD-600-1 and 600-2

PRODUCT DESCRIPTION:

CONDUCTOR:	COPPER – SILVER PLATED CONTACTS
INSULATION:	EPOXY
CONDUCTOR SUPPORTS:	EPOXY
ENCLOSURE:	ALUMINUM, NON–SEGREGATED PHASE
ENCLOSURE FINISH:	ANSI 61
NUMBER OF PHASES / WIRES:	3–PHASE / 4–WIRE
LIGHTNING IMPULSE WITHSTAND:	N/A
SHORT CIRCUIT RATING (SYM):	65 KA RMS
VOLTAGE CLASS & AMPERAGE:	600V 3200A
AMBIENT/RISE	40°C / 65°C
NUMBER OF RUNS:	2

BOM (EACH RUN)

Quantity	Description:	U/M
10	Bus Duct	Ft
10	Ground Bar, ¼" x 2" Copper	Ft
2	Vertical Elbows	Ea
0	Horizontal Elbows	Ea
1	Transformer Termination (Flex)	Ea
1	Switchgear Termination (Flex)	Ea
2	Housing Ground Pads	Ea
3	500W Heaters, 240V (Operating at 120V)	Ea
1	Thermostat (Adjustable)	Ea
1	Stainless Steel Nameplate	Ea

UNIT PRICE	**$26,405 lot**
X NO. OF RUNS	**X 2**
TOTAL PRICE	**$52,810 Total lot**

(0.6kV 2500A)
Non-Segregated Phase Bus Duct
Tag Nos. BD-600-3

PRODUCT DESCRIPTION:

CONDUCTOR:	COPPER – SILVER PLATED CONTACTS
INSULATION:	EPOXY
CONDUCTOR SUPPORTS:	EPOXY
ENCLOSURE:	ALUMINUM, NON–SEGREGATED PHASE
ENCLOSURE FINISH:	ANSI 61
NUMBER OF PHASES / WIRES:	3–PHASE / 4–WIRE
LIGHTNING IMPULSE WITHSTAND:	N/A
SHORT CIRCUIT RATING (SYM):	65 KA RMS
VOLTAGE CLASS & AMPERAGE:	600V 2500A
AMBIENT/RISE	40°C / 65°C
NUMBER OF RUNS:	1

BOM

Quantity	Description:	U/M
10	Bus Duct	Ft
10	Ground Bar, ¼" x 2" Copper	Ft
2	Vertical Elbows	Ea
0	Horizontal Elbows	Ea
1	Transformer Termination (Flex)	Ea
1	Switchgear Termination (Flex)	Ea
2	Housing Ground Pads	Ea
2	500W Heaters, 240V (Operating at 120V)	Ea
1	Thermostat (Adjustable)	Ea
1	Stainless Steel Nameplate	Ea

(13.8kV 3000A)
Non-Segregated Phase Bus Duct
Tag Nos. BD-15

PRODUCT DESCRIPTION:

CONDUCTOR:	COPPER – SILVER PLATED CONTACTS
INSULATION:	EPOXY
CONDUCTOR SUPPORTS:	EPOXY
ENCLOSURE:	ALUMINUM, NON–SEGREGATED PHASE
ENCLOSURE FINISH:	ANSI 61
NUMBER OF PHASES / WIRES:	3–PHASE / 3–WIRE
LIGHTNING IMPULSE WITHSTAND:	95
SHORT CIRCUIT RATING (SYM):	50 KA RMS
VOLTAGE CLASS & AMPERAGE:	15000V 3000A
AMBIENT/RISE	40°C / 65°C
NUMBER OF RUNS:	1

BOM

Quantity	Description:	U/M
10	Bus Duct	Ft
10	Ground Bar, ¼" x 2" Copper	Ft
2	Vertical Elbows	Ea
0	Horizontal Elbows	Ea
1	Transformer Termination (Flex)	Ea
1	Switchgear Termination (Flex)	Ea
2	Housing Ground Pads	Ea
2	500W Heaters, 240V (Operating at 120V)	Ea
1	Thermostat (Adjustable)	Ea
1	Stainless Steel Nameplate	Ea

(0.6kV 3200A)
ADD/DELETE PRICES
NON-SEGREGATED PHASE BUS DUCT

Description:	U/M	Add Price		Delete Price	
Bus Duct	Ft	$	1,449	$	869
Vertical Elbow	Ea	$	1,811	$	1,087
Horizontal Elbows	Ea	$	2,536	$	1,522

(0.6kV 2500A)
ADD/DELETE PRICES
NON-SEGREGATED PHASE BUS DUCT

Description:	U/M	Add Price		Delete Price	
Bus Duct	Ft	$	1,670	$	1,002
Vertical Elbow	Ea	$	2,088	$	1,253
Horizontal Elbows	Ea	$	2,923	$	1,754

(15kV 3000A)
ADD/DELETE PRICES
NON-SEGREGATED PHASE BUS DUCT

Description:	U/M	Add Price		Delete Price	
Bus Duct	Ft	$	1,634	$	980
Vertical Elbow	Ea	$	2,043	$	1,226
Horizontal Elbows	Ea	$	2,860	$	1,716

3.02 FIELD SERVICES (for 15kV SWGR):

A. Bid Price shall include five man-days and one round trip to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.

B. Manufacturer's field representative shall assist installing contractor with assembly and installation of switchgear per Supplier's installation and operation and maintenance manuals.

1. Inspection of switchgear for damage during shipment and installation.
2. Makeup of shipping split wiring connections.
3. Makeup of shipping split bus and enclosure connections.
4. Verification of final setting of the switchgear lineup per Supplier's requirements.
5. Coordinate and make installing contractor aware of any additional installation requirements.
6. Insert breakers and instrument transformers into cubicles and verify alignment. Adjust alignment if necessary for proper operation.

3.02 FIELD SERVICES (for 480V SWGR):

A. Bid Price shall include five man-days and one round trip to perform the specified field services. The Contract Price will be adjusted up or down for the actual services used.

B. Manufacturer's field representative shall assist installing contractor with assembly and installation of switchgear per Supplier's installation and operation and maintenance manuals.

1. Inspection of switchgear for damage during shipment and installation.
2. Makeup of shipping split wiring connections.
3. Makeup of shipping split bus and enclosure connections.
4. Verification of final setting of the switchgear lineup per Supplier's requirements.
5. Coordinate and make installing contractor aware of any additional installation requirements.

COMMENTS and CLARIFICATIONS

Section 261313-13,800-Volt Metal Clad Switchgear

2.03.D.6 We have included 10 linear feet of bus duct, and assumed that is 10 feet from termination to termination. Please contact the factory if additional feet are required.

2.06 As a Powell standard, we don't provide special wrenches, but we are providing removable hand cranks for the breaker racking and manual spring recharge. We provide the spare parts and fuses list with pricing once the PO is awarded. For a preliminary list please contact factory.

Section 262300-480-Volt Switchgear and Bus Equipment

- Powell is providing UL labels for the switchgear, with the exception of the two main breaker units. The main units will not include an UL label because of the integral HRG. Only the tie/feeder sections will be UL listed.

2.02.B.6.g We have included the Eaton Gateway Xpert 6000E for this application.

2.02.B.13 There is no indication of key interlocks on the drawing or specification. If require, please contact the factory.

2.03.B.6 We have include 10 linear feet of bus duct and assumed that 10 feet from termination to termination is only required. Please contact the factory if additional feet is required.

2.03.B.14 Powell 480V switchgear control wirings are in the rear of the unit separated by compartment barriers.

2.04 As Powell standard, we don't provide special wrenches, but we are providing removable hand cranks for breaker racking and manual spring recharge. We have not provided any spare parts for the equipment at this time. Once a purchase order is issued and we have finalized bill of material we can generate a proposal. Spare parts can then be purchased at that time.

COMMERCIAL SUMMARY

15kV Arc Resistant Switchgear	$387,498.00
480V Arc Resistant Switchgear	$394,648.00
Delta/Unibus Non Seg Bus Duct, 5-38KV BD-15kV	$33,355.00
Delta/Unibus Non Seg Bus Duct, 600 V BD-480V	$92,125.00
Field Service Installation (480V SWGR) 1 Engineer 5 weekdays	$13,000.00
Field Service Installation (15kV SWGR) 1 Engineer 5 weekdays	$13,900.00
PROJECT GRAND TOTAL	$934,526.00
One (1) 15kV Main unit	$64,583.00
One (1) 15kV Tie unit	$59,493.00
One (1) 15kV Feeder unit	$61,249.00
One (1) 15kV, 1200A Spare Breaker	$12,025.00
One (1) 480V, 3200A Spare Breaker	$8,678.00
One (1) 480V, 800A Spare Breaker	$6,152.00

MILESTONE BILLING

The following Milestone billings are applicable to this project:

Order Entry:	$93,453.00
Out For Approval:	$233,632.00
Release For Manufacturing:	$327,085.00
Ship:	$280,356.00

TERMS & DELIVERY

General:

Powell's standard Terms and Conditions of sale will apply to a purchase contract resulting from this quotation, unless negotiated otherwise prior to order award.

Drawings submitted will be in Powell's standard formats. Scope changes requested after release of fabrication drawings for construction will be documented on the final as-built drawing package submitted after shipment.

Powell factory inspection procedures, for Powell manufactured equipment, will be per Powell's established ISO QA/QC procedures and in accordance with applicable IEEE industry standards.

Factory acceptance testing of major buy-out components, if required by the project, will need to take place at the factory of origin at buyer's expense. Major buy-out components may include, but not be limited to: HVAC systems, Battery Systems, UPS systems, third-party LV motor control, etc.

Drawing Submittals:

Drawings for Approval (OFA):

Submitted 8 to 10 Weeks after order entry.

Drawing approval lead-time is inclusive of Powell's Technical Review Process. Tech Review is designed to allow project management time to ensure that Powell is in receipt of the latest project design information.

Tech Review will be completed within (1-3) weeks of order entry. Any questions/clarifications that result from this review process will be submitted for customer approval and/or responses before Powell can complete and issue drawing packages for approval.

Release to Manufacturing (RTM) Drawings:
Submitted (3-4) Weeks after return of approval drawings.

RTM drawing issue will incorporate approved-as-noted customer mark-ups to approval drawings issued. RTM issue is intended to document that customer changes have been noted and incorporated into the final design drawings that will be released for fabrication.

Record (Shop) Drawing Package:
Submitted (4-6) weeks after issue of RTM drawings.

Record (Shop) drawing issue includes all drawings previously issued with changes incorporated. Additional drawings released at Record stage will include: detailed wiring diagrams, PCR interconnection schedules (if applicable), and conduit schedules (if applicable).

Shipment:

18 to 20 Weeks after return of all approval drawings issued with full release to proceed with manufacturing.

Lead-times for drawings and delivery are based on current engineering and shop loading at the time this proposal was submitted. Lead-times may vary based on actual purchase order award date. Please contact your Powell Sales Representative to discuss your
on-site need dates or expedited drawing and delivery options to meet your specific project needs.

Note: Design/Scope changes during drawing approvals and/or after RTM or Shop dates may result in a schedule and/or cost impact to the project.

As-Built Drawings and Data CD's:

Certified As-Built Drawings and Data CD's will be submitted (2-4) Weeks after shipment from Powell Factory.

Pricing:

Pricing is firm through Powell's quoted drawing and delivery schedule.

Taxes and Duties:

None included in base proposal.

Terms of Payment: Net (30) days from invoice date.

Progress Payments: The following progress payments are applicable to this proposal:

10% - Order Entry:
25% - Out for Approval:
35% - Release for Manufacturing:
30% - Ship:

Cancellation Schedule: The following cancellation percentages are applicable to this proposal:

20% : After Order Entry
60% : After Submittal of Approval Drawings
100% : After Return of Approved or Approved as noted drawings

Freight/Title Transfer:

FCA (Free Carrier), Powell Factory, Houston, Texas Incoterms 2010, Freight Payment: Collect, Freight charges <u>not included</u> in quoted price.
Transportation arranged by customer (third-party) nominated carrier. Title transfer at Powell factory.

FCA (Free Carrier), Powell Factory, Houston, Texas Incoterms 2010, Freight Payment: Prepay and Add, Billed at Cost plus 15%.
Transportation handled by Powell nominated carrier.
Freight Prepay and Add, billed at actual cost plus 15%.
Title transfer at Powell Factory.

Note: Net Add 1.5% to project lot net total to provide title transfer at Customer Jobsite (gate).

DAP (Delivered at Place), Customer Jobsite (Gate) Incoterms 2010, Freight Payment: Prepaid and Allowed.
Full Freight Allowed and included in quoted price.
Transportation handled by Powell nominated carrier.
Title transfer upon arrival at Customer Jobsite (Gate).

Shipping Preparation: Standard domestic preparation is included in quoted price.

Warranty:	Powell standard warranty, 12 months from energization or 18 months from date of shipment, whichever occurs first. Note: Extended warranty terms available upon request. Please contact your Powell Sales Executive for more information.
Spare Parts Quotation:	Will be supplied upon completion of customer approved bill of material.
Customer Witness Testing:	Not included in base price. FAT days at Powell factory will be billed at $2,500 per day as applicable. (3) Days at Powell Factory, Monday thru Friday, included in quoted price. Additional days, if requested, will be billed at $2,500 per day.
Drawings and IOM Manuals:	Powell issues drawings electronically to a customer specified Web Address or Project FTP site. Powell can support a variety of electronic formats for Powell generated drawings. Electronic drawing formats from sub-suppliers will be provided as available from the supplier.
Field Services:	Not included in quoted scope of supply. Please refer to attached Powell Field Service Rate Schedule.

Thank you for the opportunity for Powell to serve you. Should you have any questions or additional requirements please contact me.

Submitted by:

William Turner
(713) 947-4421
Bill.turner@powellind.com

/pf

POWELL Standard Conditions of Sale

Sale of any of the equipment or services described or referred to in this quotation at the quoted prices is expressly conditioned upon the terms and conditions set forth below. Any order for or any statement of intent to purchase any such equipment or services, or any direction to proceed with engineering, procurement, manufacture or shipment, shall constitute assent to said terms and conditions and a representation that the Purchaser is solvent. Any additional or different terms or conditions set forth in any such communication from the Purchaser are hereby objected to by Powell Electrical Manufacturing Company (the "Company") and shall not be effective or binding unless expressly assented to in writing by an authorized representative of the Company. No contract shall be formed except upon the terms and conditions contained herein and any additional or different terms to which the Company has expressly consented.

WARRANTY

The Company warrants to the Purchaser that the equipment to be delivered hereunder will be free from defects in material or workmanship and will be of the kind and quality designated or specified in the contract.

This warranty shall apply only to defects appearing within one year from the date of shipment by the Company; provided, however, that if Purchaser, in the course of its regular and usual business, transfers title to or leases such products (including equipment incorporating such products) to a third party, such period shall run until one year from such transfer or lease or eighteen (18) months from shipment by the Company, whichever comes first.

If the Company installs the equipment or supplies technical direction of installation by contract, the warranty period shall run from the completion of installation, provided same is not unreasonably delayed by the Purchaser. The conditions of any tests shall be mutually agreed upon and the Company shall be notified of, and may be represented at, all tests that may be made.

If the equipment delivered hereunder does not meet above warranty, and if the Purchaser promptly notifies the Company, the Company shall thereupon correct any defect, including non-conformance with the specifications, either (at its option) by repairing any defective or damaged parts of the equipment, or by making available at the Company's plant necessary repaired or replacement parts. The liability of the Company under this warranty (except as to title), or for any loss or damage to the equipment whether the claim is based on contract or negligence, shall not in any case exceed the cost of correcting defects in the equipment as herein provided and upon the expiration of the warranty period all such liability shall terminate. The foregoing shall constitute the exclusive remedy of the Purchaser and the exclusive liability of the Company.

The foregoing warranty is exclusive and in lieu of all other warranties, whether written, oral, implied or statutory (except as to title). NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PURPOSE SHALL APPLY. The Company does not warrant any equipment of other manufacture designed by Purchaser.

PATENTS

The Company shall defend any suit or proceeding brought against the Purchaser so far as based on a claim that any equipment, or any part thereof, furnished under this contract constitutes an infringement of any patent of the United States, if notified promptly in writing and given authority, information and assistance (at the Company's expense) for the defense of same, and the Company shall pay all damages and costs awarded therein against the Purchaser. In case said equipment, or any part thereof, is in such suit held to constitute infringement and the use of said equipment or parts is enjoined, the Company shall, at its own expense and at its option, either procure for the Purchaser the right to continue using said equipment or part; or replace same with non-infringing equipment; or modify it so it becomes non-infringing; or remove said equipment and refund the purchase price and the transportation and installation costs thereof. The foregoing states the entire liability of the Company for patent infringement by said equipment or any part thereof.

The preceding paragraph shall not apply to any equipment, or any part thereof, manufactured to Purchaser's design. As to any such product, part, or use in such combination, the Company assumes no liability whatsoever for patent infringement and Purchaser will hold the Company harmless against any infringement claims arising there from.

DELIVERY

Shipping dates are approximate and are based upon prompt receipt of all necessary information from Purchaser. Unless otherwise specified by the Company, delivery will be made and title will pass F.O.B. point of shipment to Purchaser. Risks of loss or damage pass to Purchaser on delivery.

The Company shall not be liable for delays in delivery or in performance or failure to manufacture or deliver, due to (1) causes beyond its reasonable control, or (2) acts of God, acts of the Purchaser, acts of civil or military authority, priorities, fires, strikes or other labor disturbances, floods, epidemics, war, riot, delays in transportation or car shortages, or (3) inability on account of causes beyond its reasonable control to obtain necessary labor, materials, components, or manufacturing facilities. In the event of any such delay, the date of delivery or of performance shall be extended for a period equal to the time lost by reason of the delay.

PAYMENTS

Pro rata payments shall become due as shipments are made. If shipments are delayed by the Purchaser, payments shall become due on the date when the Company is prepared to make shipment. If the work to be performed hereunder is delayed by the Purchaser, payments shall be made based on the purchase price and the percentage of completion. Equipment held for the Purchaser shall be at the risk and expense of the Purchaser.

If the financial condition of the Purchaser at any time does not, in the judgment of the Company, justify continuance of the work to be performed by the Company hereunder on the terms of payment agreed upon, the Company may require full or partial payment in advance or shall be entitled to cancel any order then outstanding and shall receive reimbursement for its reasonable and proper cancellation charges. In the event of bankruptcy or insolvency of the Purchaser or in the event any proceeding is brought against the Purchaser, voluntarily or involuntarily, under the bankruptcy or any insolvency laws, the Company shall be entitled to cancel any order then outstanding at any time during the period allowed for filing claims against the estate and shall receive reimbursement for its reasonable and proper cancellation charges. The rights of the Company under this paragraph are cumulative and in addition to all rights available to the Company at law or in equity.

SALES AND SIMILAR TAXES

The Company's prices do not include sales, use, excise or similar taxes. Consequently, in addition to the price specified herein, the amount of any present or future sales, use, excise, or other similar tax applicable to the sale or use of the equipment hereunder shall be paid by the Purchaser, or in lieu thereof the Purchaser shall provide the Company with a tax-exemption certificate acceptable to the taxing authorities.

DISCLOSURE OF INFORMATION

Any information, suggestions or ideas transmitted by Purchaser to the Company in connection with performance hereunder are not to be regarded as secret or submitted in confidence except as may be otherwise provided in a writing signed by a duly authorized representative of the Company.

CANCELLATION

The Purchaser may cancel his order only upon written notice and upon payment to the Company of reasonable and proper cancellation charges, which may take into account, without limitation (costs of materials incurred through the date of cancellation, charges for labor for work done through the date of cancellation, and the Company's margin on such materials and labor).

LIMITATION OF LIABILITY

Unless otherwise agreed in writing by a duly authorized representative of the Company, products sold hereunder are not intended for use in connection with any nuclear facility or activity. If so used, the Company disclaims any liability for any nuclear damage, injury or contamination, and Purchaser shall indemnify the Company against any such liability, whether as a result of breach of the contract, warranty, tort (including negligence) or otherwise.

In no event, whether as a result of breach of contract, warranty, tort (including negligence) or otherwise, shall the Company or its suppliers be liable for any special, consequential, incidental or penal damages, including but not limited to, loss of profit or revenues, loss of use of the products or any associated equipment, damage to associated equipment, cost of capital, cost of substitute products, facilities, services or replacement power, down-time costs, or claims of Purchaser's customers for such damages. Any additional or different terms specifically relating to or addressing the subject matter of this paragraph shall be deemed material alterations within the meaning of Section 2.207(b)(2) of the Texas Business and Commerce Code.

The Company agrees to indemnify Purchaser for costs or damages suffered by Purchaser arising solely or principally by reason of the negligence or intentional wrongful act of the Company in connection with its performance of this contract. Except as provided in the section entitled "PATENTS", in no event, whether as a result of breach of contract (including the provision of the preceding sentence), warranty, tort (including negligence and intentional wrongful act) or otherwise, shall the Company's liability to Purchaser for any loss or damage arising out of, or resulting from, this contract, or from the Company's performance or breach, or from the products or services furnished hereunder, exceed the price of the specific product or service which gives rise to the claim. Except as to title, any such liability shall terminate upon the expiration of the warranty period specified in the section "WARRANTY".

If the Company furnishes Purchaser with advice or other assistance which concerns any products supplied hereunder or any system or equipment in which any such product may be installed and which is not required pursuant to this agreement, the furnishing of such advice or assistance will not subject the Company to any liability, whether in contract, warranty, tort (including negligence) or otherwise.

GENERAL

The Company represents that any goods to be delivered hereunder will be produced in compliance with the requirements of the Fair Labor Standards Act of 1938, as amended.

Any assignment of this contract or any rights hereunder, by the Purchaser without written consent of the Company shall be void.

The provisions of this contract are for the benefit of the parties thereto and not for any other person.

No understanding, promise or representation, and no waiver, alteration or modification of any of the provisions hereof, shall be binding upon the Company unless assented to in writing by an authorized representative of the Company.

The invalidity, in whole or part, of any of the foregoing paragraphs will not affect the remainder of such paragraph or any other paragraph contained herein.

The validity, performance and all matters relating to the interpretation and effect of this agreement and any amendments hereto shall be governed by the law of the State of Texas, without giving effect to choice of law principles thereof.

ARBITRATION

Any disputes or differences concerning the performance, breach or interpretation of any of the provisions of this quote shall be resolved only by binding arbitration to be conducted in accordance with its commercial arbitration rules and judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction thereof will be governed by the statutes of the State of Texas and the proceeding will be held in Houston, Harris County, Texas.

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