

April 14, 2021

Ms. Jessica Fett  
Independence Power & Light (IPL)  
21500 E Truman Rd  
Independence, MO 64056

Re: Invitation to Bid #22014 – Sub A. Cap. Bank Construction Project – BMcD Technical Evaluation

Dear Ms. Fett:

Burns & McDonnell completed the review of the technical content associated with the bids provided by Black & McDonald (B&M) and Emerald Electrical Consultants, LLC (EEC) in response to IPL Invitation to Bid #22014. This invitation to bid is for the Substation A capacitor bank construction project.

After reviewing the technical documentation and clarifications provided by the bidders (See Attachments), we have concluded that B&M and EEC meet the technical requirements of the tender basis developed for this project and no further technical clarification is necessary.

In the absence of other technically compliant proposal, Burns & McDonnell recommends IPL proceed with B&M or EEC bids.

Sincerely,



Miguel Gomez  
Project Manager

Attachments:

- Attachment A - IPL Sub A - Bids Technical Review Summary
- Attachment B - B&M Proposal Bid 21110 - Sub A Capacitor Bank (REV 3-8-22)
- Attachment C - EEC - Substation A Cap Bank Proposal
- Attachment D - Substation A Project Execution Plan 04.08.22

cc: Mitch Krysa

**Attachment A - IPL Sub A - Bids Technical Review  
Summary**

**BMcD TECHNICAL BID EVALUATION**

**Invitation to Bid #22014 Substation A Capacitor Bank Construction project**

Items included as part of BMcD review	Bidder 1: Black and McDonald	Bidder 2: Emerald Electrical Consultants, LLC	BMcD Comments
<b>Project Execution Plan</b>	Not included as part of the bid documentation	Documentation provided outlines the main scope of services associated with project management, procurement activities and construction	
		A high-level construction execution approach was provided covering the removal and installation scopes at the existing generation building, 69-kV yard and control enclosure	No mention of the oil-liner repairs discussed during the site visit. No exception provided for this item.
<b>Clarifications/Exclusions</b>	Price includes Supervision, Labor, and Equipment to complete the scope of work discussed in our initial meeting and site visits.	Scope Clarifications provided as part of the Project Execution Plan dated 4/8/22	No deviations from the project scope have been identified based on the documentation provided by Bidder 1. Comments on Bidder 2 execution plan are listed as part of the previous section. No list of exceptions have been provided
	Price includes the cost of Payment / Performance Bond. Please note that bonding is already added in to the base bid pricing and Black & McDonald is in agreement with customer to provide 100% Payment, Performance, and Maintenance Bonding if the project is awarded.		Commercial item - not included as part BMcD review - By IPL
	Price assumes that materials provided by Independence Power & Light and that materials will be readily available for construction upon award of the project.		Major equipment delivery schedule was provided as part of the Bid documents. Equipment delivery coordination by IPL to support the construction schedule proposed by the Bidders.
	Price assumes that all phases of construction will be completed with only 1 mobilization to the project site. If crews are required to pull off due to work/materials being unavailable through no fault of the contractor, return trips will be charged as a change order to mobilize back to site to continue work.		Only 1 mobilization was considered for the construction phase. Equipment delivery coordination by IPL to support the construction schedule proposed by the Bidders.
	Price excludes any subsurface hazards, beyond rock, that would halt work.		BMcD has not been made aware by IPL on any subsurface hazards present at the job site
	Price covers haul off and disposal of transformers T1 and T1A.		Scope included as part of the tender documentation.
	In regards to the Sub A fence, the only work covered under Black & McDonald's pricing is to install the grounding around the new capacitor bank. No other fence work is included. If any work is required on the fence, that will be done as a change order.		No fence is required as part of the project scope.
	Price excludes sales tax.		Commercial item - not included as part BMcD review - By IPL
	If portions of the scope of work includes tasks that are not included in the attached unit pricing structure, all those tasks will be completed under an agreed upon change order.		Commercial item - not included as part BMcD review - By IPL
<b>Project Schedule</b>	Provided. Proposed duration for the construction scope: Approx. 13 weeks	Provided. Proposed duration for the construction scope: Approx. 7 weeks	The outage window is anticipated to be September 1, 2022 to May 31, 2023.
<b>Bid Form</b>	No additional items were added to the bid form. Quantities as per original Bid Form	Fitting adjustment cost not provided. "Dependent on actual fitting cost +15%"	Price evaluation not included as part of BMcD scope.

**Attachment B - B&M Proposal Bid 21110 - Sub A  
Capacitor Bank (REV 3-8-22)**



**INDEPENDENCE**  
\* M I S S O U R I \*

Procurement Division  
111 E Maple, PO Box 1019  
Independence, MO 64051-0519

**Invitation to Bid #22014**  
**Substation A Capacitor Bank Construction project**  
**Response Deadline Date and Time: 3/8/22, 2:00 p.m., Local Time**

**Bid opening: Microsoft Teams Meeting url:**

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_Yjc1OGZhZWYtYzgyMS00MzdkLWFmZTAAtNGMzMDg0N2VkNzc0%40thread.v2/0?context=%7b%22Tid%22%3a%22862de864-c0f2-4801-a187-836f98f56db0%22%2c%22Oid%22%3a%2278cd3938-af7a-4a7a-b818-48acfc62eaf5%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_Yjc1OGZhZWYtYzgyMS00MzdkLWFmZTAAtNGMzMDg0N2VkNzc0%40thread.v2/0?context=%7b%22Tid%22%3a%22862de864-c0f2-4801-a187-836f98f56db0%22%2c%22Oid%22%3a%2278cd3938-af7a-4a7a-b818-48acfc62eaf5%22%7d)

**or call in (audio only)**

[+1 660-631-8082](tel:+16606318082), [561141190#](tel:+1561141190) United States, Marshall

Phone Conference ID: 561 141 190#

**A non-mandatory pre-bid conference will be held at 10:00 a.m., Friday, February 18, 2022 at the Service Center at 21500 E Truman Rd, Independence MO, 54056**

**Deadline for questions is 5:00 p.m. local time on 3/4/22**

Please submit all questions regarding this Invitation to Bid online via [www.publicpurchase.com](http://www.publicpurchase.com)

**ATTENTION BIDDER – COMPLETE AND RETURN WITH BID**

Bidding Firm Black & McDonald Phone Number 816-564-6267  
(Please print or type)

Address 6001 E Front St City Kansas City State MO Zip 64120

Name of Authorized Agent Nick Ziegler Email nziegler@blackandmcdonald.com

The only authorized source for bid forms, addenda, and information regarding this bid is [www.publicpurchase.com](http://www.publicpurchase.com). Using bid forms, addenda, and bid information not obtained from [www.publicpurchase.com](http://www.publicpurchase.com) creates the risk of not receiving necessary bid information that may eliminate your bid from consideration. Bids must be submitted online via [www.publicpurchase.com](http://www.publicpurchase.com). Paper, fax, or email bids will NOT be accepted and will not be returned to sender.

Submitting a bid response is bidder’s response to adhere to all specifications, scopes, terms, and conditions of this ITB.

March 08, 2022

Independence Power & Light  
17221 E. 23<sup>rd</sup> St S  
Independence, MO 64057

Project: **Bid ITB 21110 – Substation A Capacitor Bank** (REV 03/08/2022)

To Whom It May Concern

Black & McDonald is pleased to provide you unit pricing for the project referenced above. Our pricing is broken down on the attached pricing sheets. Our pricing is based upon information and drawings provided to us at this time along with the following Exclusions/Clarifications:

**Clarifications/Exclusions**

- Price includes Supervision, Labor, and Equipment to complete the scope of work discussed in our initial meeting and site visits.
- Price includes the cost of Payment / Performance Bond. Please note that bonding is already added in to the base bid pricing and Black & McDonald is in agreement with customer to provide 100% Payment, Performance, and Maintenance Bonding if the project is awarded.
- Price assumes that materials provided by Independence Power & Light and that materials will be readily available for construction upon award of the project.
- Price assumes that all phases of construction will be completed with only 1 mobilization to the project site. If crews are required to pull off due to work/materials being unavailable through no fault of the contractor, return trips will be charged as a change order to mobilize back to site to continue work.
- Price excludes any subsurface hazards, beyond rock, that would halt work.
- Price covers haul off and disposal of transformers T1 and T1A.
- In regards to the Sub A fence, the only work covered under Black & McDonald's pricing is to install the grounding around the new capacitor bank. No other fence work is included. If any work is required on the fence, that will be done as a change order.
- Price excludes sales tax.
- If portions of the scope of work includes tasks that are not included in the attached unit pricing structure, all those tasks will be completed under an agreed upon change order.

**Project Pricing**

<b>Base Bid Phase</b>	<b>\$ 583,821.42</b>
<b>Force Account Allowance</b>	<b>\$ 58,382.14</b>
<b>Total Price</b>	<b>\$ 642,203.56</b>

Thank you for the opportunity to submit pricing for this project. If you have any questions or would like to discuss our proposal in detail please contact me on my cell at (816) 564-6267 or via email at [nziegler@blackandmcdonald.com](mailto:nziegler@blackandmcdonald.com).

Sincerely,



Nick Ziegler  
Manager of Utility Services

**General Terms & Conditions and Response Instructions**  
**Construction**

**Response Instructions to Bidder**

**1. ACCEPTANCE**

Each bid is received with the understanding that the acceptance in writing by the City of the offer to furnish any or all commodities or services described therein shall constitute a contract between the bidder and the City, which shall bind the bidder on his or her part to furnish and deliver the commodities and services quoted at the prices stated in accordance with the conditions of said accepted bid. The City, on its part, may order from the contractor, except for cause beyond reasonable control, and to pay for, at the agreed prices, all commodities and services specified and delivered.

Upon receipt of an Invitation to Bid (ITB) package containing a City of Independence "sample contract" as part of the requirements, it is understood that the bidder has reviewed the documents with the understanding that the City requires all contracts between the parties be entered into via this document. If any exceptions are taken to any part, each must be stated in detail and submitted as part of the bid. If no exceptions are stated, it is assumed that the bidder fully agrees to the provisions contained in the "sample contract" in its entirety. No exceptions to the General Terms & Conditions of the ITB shall be accepted.

**2. DEFINITIONS**

- A. The term "City" means the City of Independence, Missouri.
- B. The term "contractor" means the person or organization that receives the award after the bid process.
- C. The term "Invitation to Bid" and acronym "ITB" means a solicitation for bids.
- D. The term "bidder" means the person or organization responding to an ITB with a bid.
- E. The term "bid" means the response submitted by the bidder in response to an ITB.

**3. ITB SOURCE**

Bidders may view and download bid documents from [www.publicpurchase.com](http://www.publicpurchase.com), via the City's website at [www.indepmo.org](http://www.indepmo.org). Bidders using ITB documents not obtained from [www.publicpurchase.com](http://www.publicpurchase.com) risk not receiving any necessary addenda, possibly eliminating their bids from consideration.

**4. QUESTIONS**

Questions regarding the bid process shall be submitted via [www.publicpurchase.com](http://www.publicpurchase.com). The City will respond to questions via [www.publicpurchase.com](http://www.publicpurchase.com), thus providing all questions and answers to all prospective bidders equally.

**5. PREPARATION OF BIDS**

- A. Bidders are responsible for conducting site visits (if applicable), attending pre-bid conferences (if applicable) and examining all drawings, specifications, schedules, etc., included in the ITB. Failure to do so will be at the bidder's risk.
- B. Each bidder shall furnish the information required in the ITB. The bidder shall complete all sections requiring information or a signature. An agent duly authorized to enter the firm into a legally binding, contractual agreement must sign the document. Electronic signature is acceptable.
- C. Unit price for each unit bid shall be shown and shall include packaging for shipment unless otherwise specified. A total shall be entered in the total column for each item bid. In case of discrepancy between a unit price and extended price, the unit price shall prevail.
- D. Freight, if applicable, shall be shown as a separate line item cost and not included in the cost of the goods.
- E. Prices quoted are to be firm and final.
- F. Bidders shall prepare their bids for City projects without including sales tax.
- G. Alternate bids for supplies or services other than those specified will not be considered unless authorized by the ITB.
- H. Bidder must state a definite date and time for delivery of supplies or services unless otherwise specified in the ITB.
- I. Number of days shall be calendar days, which includes Saturdays, Sundays, and holidays.
- J. If the item has a trade name, brand, or catalog number, such must be stated in the bid.
- K. Bidders shall submit online via [www.publicpurchase.com](http://www.publicpurchase.com) unless otherwise specified in the ITB.
- L. Bond requirements and liquidated damages, if applicable, will be set forth in the specifications.

**6. ADDENDUM**

The City reserves the right to officially modify or cancel an ITB after issuance. Modifications will be made only by written addendum. Bidders must acknowledge any addendum by opening and accepting on [www.publicpurchase.com](http://www.publicpurchase.com).

**7. BUY AMERICAN AND DOMESTIC PRODUCTS POLICY STATEMENT**

It is the policy of the City of Independence, Missouri, to buy materials, products, supplies, provisions, and other articles produced, manufactured, compounded, made or grown within the State of Missouri, when they are found in marketable quantities in the state, and are of a quality suited to the purpose intended and can be secured without additional cost over products of other states; provided however, that quality and fitness of articles shall be considered in purchasing or letting contracts for articles herein mentioned.

It is the policy of the City of Independence to buy goods or commodities that have been manufactured, assembled, or produced in the United States of America, unless:

- A. The purchase, lease, or contract involves an expenditure of less than \$5,000.
- B. Only one line of a particular good or product is manufactured, assembled, or produced in the United States.
- C. The specified products are not manufactured, assembled, or produced in the United States in sufficient quantities to meet the City's requirements or cannot be manufactured, assembled, or produced in the United States within the necessary time in sufficient quantities to meet the City's requirements; or



- D. Obtaining the specified products manufactured, assembled, or produced in the United States would increase the purchase price by more than 10%
- E. To qualify for the preference, bidder shall clearly state in its bid whether the materials quoted were manufactured, assembled, or produced in the United States of America. If multiple items are listed in the ITB, the bidder shall clearly state which items were manufactured, assembled, or produced in the United States of America.

**8. LOCAL PREFERENCE POLICY**

Licensed businesses operating from a physical address in the City of Independence for a minimum of six (6) months when quality, service and other terms of the purchases are equal to or better than the low bid. The local business shall be given a preference of ten percent (10%) over the low bid, provided that the difference between the low bid and the local bid does not exceed thirty thousand dollars (\$30,000.00) maximum.

**9. EQUAL EMPLOYMENT OPPORTUNITY**

During the performance of this contract or purchase order, the contractor agrees as follows:

- A. The contractor will not discriminate against any employee or applicant for employment because of race, age, color, religion, sex, national origin or any other legally protected category. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated fairly during employment, without regard to their race, age, color, religion, sex, or national origin. Such action shall include, but not be limited to: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- B. The contractor will state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, sex, or national origin in all solicitations or advertisements for employees placed by or on behalf of the contractor.
- C. The contractor will send a notice advising the said labor union or workers' representatives of the organization's commitment under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment to each labor union or representative of workers with which he or she has a collective bargaining agreement or other contract or understanding.
- D. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- E. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his or her books, records, and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- F. In the event of the contractor's noncompliance with the non-discrimination clauses of this contract or purchase order with any of the said rules, regulations, or orders, this contract or purchase order may be canceled, terminated, or suspended in whole or in part, and the contractor may be declared ineligible for any further government contracts, purchase orders, or federally assisted contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, or by rules, regulations, or order of the Secretary of Labor, or as otherwise provided by law.
- G. The contractor will include the entire text of this Equal Employment Opportunity section and its subsections in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the department may direct as a means of enforcing such provisions, including sanctions of noncompliance; provided, however, that in the event a contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the department, the contractor may request the United States to enter into such litigation to protect the interest of the United States.

**10. ANTI-DISCRIMINATION AGAINST ISRAEL ACT**

Contractors working on behalf of the City of Independence are to abide by Missouri Revised Statute 34.600, otherwise known as the Anti-Discrimination against Israel Act.

**11. CONFLICT OF INTEREST AND DEBARMENT**

By submission of its response, the contractor certifies that:

- A. No Councilmember, nor the City Manager, the Director of Finance or the City Procurement Manager is financially interested in what the bidder is offering to sell to the City pursuant to this invitation, nor is the bidder a City employee or board member whose bid creates a conflict of interest. A conflict of interest would arise if a City employee or board member were in a position to affect either the decision to solicit bids or the selection of the successful bidder.
- B. Bidder has not participated in collusion or committed any act in restraint of trade, directly or indirectly, which bears upon anyone's response or lack of response to this Invitation.
- C. The authorized signer of the bid document certifies that the contractor and each of its principals are not suspended or debarred by the City of Independence, State of Missouri or Federal government.
- D. All bidders shall complete, have notarized, and submit the attached non-conflict of interest and non-collusion form. Failure to submit the completed form shall be grounds for rejection of bid.

**12. SUBMISSION OF BIDS**

- A. Bids and any modifications (addendum) shall be submitted electronically through [www.publicpurchase.com](http://www.publicpurchase.com).
- B. Telephonic, emailed, paper, or faxed bids will not be considered, unless authorized in the ITB.
- C. Samples of items, when required, must be submitted within the time specified and unless otherwise specified by the City, at no expense to the City. If not consumed by testing, samples will be returned at bidders request and expense, unless otherwise specified in the ITB.

- D. Bids will be opened at the date and time indicated on the ITB cover page. An unofficial bid tabulation, with no indication of award or final numbers, will be made available upon request. Bidders must allow ample time for the City to create the tabulation (a minimum of five business days).
- E. A final bid tabulation and Notice of Intent to Award for bids over \$50,000 will be posted on the City's website and [www.publicpurchase.com](http://www.publicpurchase.com) at least five days prior to City Council approval.

**13. MODIFICATION OR WITHDRAWAL OF BIDS**

Modification or withdrawal of bids will be via [www.publicpurchase.com](http://www.publicpurchase.com). Click on "Edit" response and delete the desired item(s) previously entered. Delete any uploaded documents, and click "Save". This will remove the initial response. Follow the same procedure to withdraw a bid before the bid deadline and simply cancel the submittal.

**14. LATE BIDS**

It is the responsibility of the bidder to submit the bid on or before the date and time of the ITB submission deadline. Bids will NOT be accepted after the date and time of closing under any circumstances.

**15. QUALIFICATIONS OF BIDDERS**

The City shall exercise due diligence in determining the responsibility of bidders. The bidder shall furnish all information, within the time frame specified, if requested by the City. The City reserves the right to reject any bid if the information is not submitted in a timely manner or the information, or subsequent investigation, fails to satisfy the City that such bidder is properly qualified to carry out the obligations of the contract and to complete the work as specified in the ITB.

The City may consider the following factors in determining a bidder's responsibility:

- A. The ability, capacity, and skill of the bidder to perform the contract or provide the required materials, equipment, or supplies;
- B. Whether the bidder can perform the contract or provide the materials, equipment, or supplies promptly or within the time specified without delay or interference;
- C. The quality of performance in previous contracts;
- D. The previous and current compliance by the bidder with laws and ordinances related to the contract or service;
- E. The sufficiency of the bidder's financial resources to perform the contract or provide the commodities;
- F. The ability of the bidder to provide future maintenance and service.

**16. AWARD**

Award shall be made to the lowest priced most responsive and responsible bidder who submits the bid most advantageous to the City. Additional considerations will be given to prior contract history with the City, references, warranty information, delivery schedule, and other requirements as specified in the ITB. The City reserves the right to accept or reject any or all bids or portions of bids, make multiple awards, to waive irregularities and technicalities, and to request re-bids on the materials or services described in the bid documents. The City reserves the right to award the contract on such materials or services as the City deems will best serve its interests. The City reserves the right to award the contract on a partial-order basis, lump-sum or individual-item basis, or such combination as shall best serve the interest of the City unless otherwise specified. Conditional bids, including bids in are subject to rejection in whole or in part at the sole discretion of the City. Bids that take exception to the City's General Terms and Conditions will be rejected.

**17. RIGHT OF PROTEST**

The Procurement Manager, or appointed designee, will accept written protests regarding the solicitation of any goods, services or commodities with a dollar value of \$50,000 or less within five (5) business days of a bid opening. For purchases over \$50,000, a Notice of Intent to Award will be posted on the Internet at [www.publicpurchase.com](http://www.publicpurchase.com). Any bid protest must be filed within five (5) business days of the date of posting of the Notice. Neither the City nor Public Purchase shall be responsible for directly notifying bidders of the Notice of Intent to Award.

Protests must be received in the office of the Procurement Manager and must contain the following information:

- A. Company name, address, phone number and signature of the authorized representative;
- B. Solicitation number;
- C. Detailed statement describing the grounds for the protest; and
- D. Supporting evidence or documents to substantiate the claim.

The Director of Finance and Administration will review the information provided and issue a written decision within five (5) business days of receipt of the protest. This decision shall be final.

**GENERAL TERMS & CONDITIONS FOR CONSTRUCTION**

**18. CONTRACTOR'S RESPONSIBILITY**

- A. The contractor explicitly understands and agrees that the City is in no way responsible for the cost to the contractor of the work, nor for the cost of the risks involved in executing the work, and that the payments herein provided include compensation for all risks as well as for all completed construction. It is expressly understood that the contractor is in all respects an independent contractor for this work and is in no respect an agent, servant or employee of the City. The contractor specifically represents that in performing work covered by this agreement he or she is the sole employer of all labor to be furnished in the performance of this work and that, within the meaning of all federal and state unemployment compensation, insurance or other laws and all State Worker's Compensation Acts, the contractor's employees and the

employees of all subcontractors are not employees of the City for any purpose whatsoever; also that the contractor accepts exclusive liability for all contributions, taxes, interest and penalties necessarily paid by the City under unemployment compensation, insurance or other laws on account of all persons employed by the contractor or any subcontractors hereunder, and the contractor hereby agrees to reimburse the City for all contributions, taxes, interest, penalties, if any, necessarily paid by the City under unemployment compensation, insurance or other laws covering employees of the contractor or any subcontractors.

- B. The contractor agrees to pay in full for all furnished materials and for all employed labor for the work or any part thereof, and to save the City free and harmless from any lien for work or labor performed, or materials or supplies furnished in the performance of the work under this contract, and from every claim, demand, or lien arising from or growing out of any act or thing done or suffered by the contractor or any agent, servants or subcontractors, and any employees in, about or connected with the construction of the work aforesaid. The contractor agrees to pay and discharge all bills and claims against the contractor in any way incurred in connection with the work herein provided for; it being intended hereby to cover the payment of all items, whatsoever their nature, in addition to items which entitle the claimant to a lien upon any property of said City by virtue of the laws of the State of Missouri.
- C. The contractor shall require any subcontractors deemed a transient employer as defined by State law to show proof of having filed a financial assurance instrument with the State Director of Revenue and to show proof that the subcontractor holds a current valid certificate of insurance for workers' compensation coverage in Missouri prior to the subcontractor performing any work under the contract. If required by the State Director of Revenue or the State Director of the Division of Worker's Compensation, the contractor will withhold all or any part of payment to the subcontractor to satisfy State law.
- D. The contractor agrees to comply in all respects with the requirements of law relating to furnishing reports and statements, or as may be reasonably required by the City.
- E. It shall be the responsibility of the contractor to examine the site of the work to determine the amount of work to be done in connection with the construction herein specified, the quantities of material required, and the construction equipment and labor necessary for the performance of the contract. By submission of a bid for this work, the contractor represents that he or she has investigated the character of the work and conditions which may be encountered, and the quantities and types of related work not covered by unit prices, and agrees that the data furnished herein is merely informative and represents the best information available at the time of advertising for bids. The contractor understands that such information or data is furnished to the bidder without guarantee of its accuracy and variations from the indicated amounts or types of work, other than that covered by contract unit prices, required to complete the contract will not entitle the City to any credits or the contractor to any extra payment.

#### **19. APPLICABLE CODES AND STANDARDS**

- A. Reference to standard specifications of any technical society, organization or association, or to codes of local or state authorities, shall mean the latest such standard, code, specification or tentative specification adopted and published at the date of taking of bids, unless specifically otherwise stated. Applicable codes and standards referred to in these specifications shall establish minimum requirements for equipment, materials and construction and shall be superseded by more stringent requirements of drawings and specifications when and where they occur.
- B. All construction methods and tools shall meet all State of Missouri safety requirements and comply with commonly accepted standards for safety and health of personnel engaged in construction work.

#### **20. COMPLIANCE WITH LAWS, PERMITS, LICENSES AND TAXES**

- A. The contractor shall conform to and comply with all applicable laws, bylaws, regulations and ordinances with regard to all and every action and operation, and shall require conformity and compliance of all subcontractors and employees in such a manner as to save the City harmless. The contractor shall secure and be financially responsible for all permits, licenses, approvals, acceptances, etc., relative to the conduct of all work and shall give all notices necessary to the due and lawful prosecution of the work. Fees for required City permits for work within the construction limits will not be waived.
- B. The City is exempt from sales tax. This includes purchases by contractors for City projects. The City will provide a certificate to contractors for their use in obtaining the sales tax exemption. Contractors are to prepare their bids for City projects without including sales tax. It is the responsibility of the contractor to request a tax exempt certificate and a project tax exemption certificate before the project begins. Missouri state law prohibits issuance of project exemption certificates after the project is completed.

#### **21. FORCE MAJEURE**

Neither party shall be liable for delays, or defaults in the performance of a contract due to Acts of God or the public enemy, riots, strikes, fires, explosions, accidents, governmental action of any kind or any other causes of a similar character beyond its control and without its fault or negligence. Neither party shall penalize or add any additional fees, surcharges, or any other financial requirements due to force majeure.

#### **22. PATENTS**

The bidder warrants that the articles described herein and the sale or use of them will not infringe upon any U.S. or foreign patent or copyright and bidder covenants they will at their own expense, defend every suit that may be brought against the City, or those selling or using City's product (provided winning bidder is promptly notified of such suit and all documentation delivered) for any alleged infringement of any patent or copyright by reason of the sale or use of such articles; and contractor agrees they will pay all costs, damages, and profits recoverable in any such suit. All fees or royalties for any patented article or operation of work or any part thereof, or any materials, tools, implements, machinery, fixtures, or anything used shall be included in the price stipulated in the bid, and the contractor shall protect and hold harmless the City against all demands for such fees, royalties, and claims.

### **23. SUPERVISION AND INSPECTION**

- A. The work herein considered is to be constructed in accordance with the contract documents. Wherever the words "directed, permitted, approved, acceptable, satisfactory," or words or phrases of similar import occur in the contract documents, they shall be understood to be functions of the City and to be exercised at the City's discretion.
- B. Methods of construction and procedure shall be of the contractor's own selection, provided no requirement of the contract documents is violated and the work is completed within the time allowed. Approval of the City of any construction device or method, or absence of disapproval, shall not relieve the Contractor of full responsibility for any failure thereof and shall not connote and is not intended to connote that the City will direct the manner in which the work is to be performed under the contract.
- C. All materials and every process of manufacture and construction shall be subject to inspection at all times and the City or any representative shall have free access to all operations. The Contractor shall provide necessary facilities for inspecting workmanship and testing of materials, and the City shall have the right to select suitable samples of materials for testing and examination, which the contractor shall supply without charge. In case such samples must be shipped to some other point for inspection or testing, the contractor shall box or crate samples as necessary and shall deliver them at points designated for shipment, without charge. Omission of inspection shall not relieve the contractor of any obligation to produce the work required by plans and specifications.
- D. Rejected materials shall be removed promptly from the vicinity of the work and the contractor shall promptly remove, reconstruct, replace and make good as may be directed, without charge, any defective work. If in the judgment of the City, the defective work would perform within an allowable tolerance, the contractor may be given the choice of receiving reduced payment for the work or removing and replacing the defective work. Oversight or error of judgment of inspectors, or previous acceptance, shall not relieve the Contractor from the obligation to make good defects whenever discovered. If the contractor does not make corrections of such condemned work and remove rejected materials within a reasonable time, as fixed by written notice, the City may make removals and corrections and charge the expense to the contractor.
- E. The contractor shall furnish to the City any information concerning the nature or source of any material or equipment or part thereof which the contractor proposes to use. Tests may be conducted where, in the opinion of the City, such are necessary. Where the contractor desires to propose for use in the work any material or product as an alternative or equivalent to a material or product specified herein, the contractor will be required to submit samples to a testing bureau designated by the City, and shall pay the cost of such testing and analysis as may be required to determine the suitability of such materials and products.

### **24. PERSONAL LIABILITIES**

In carrying out any of the provisions of a contract or in exercising any power or authority granted to them thereby, there shall be no personal liability upon any member, agent or representative of the City. No act or failure to act on the part of the City or any agent of the City, payment for the work in whole or in part, extension of time or possession taken of the work, shall operate as a waiver of any right to damages therein provided for; nor shall waiver or breach of contract be held to be a waiver of any other or subsequent breach.

### **25. SUBLETTING OR ASSIGNING CONTRACT**

- A. The contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of the contractor's right, title or interest therein, without written consent of the City. Request for permission to sublet, assign or otherwise dispose of any portion of the contract shall be in writing and shall be accompanied by evidence that the organization which will perform the work is particularly experienced and equipped for such work.
  - (1) In case such consent is given, the contractor will be permitted to sublet a portion thereof, but the contractor shall perform work amounting to not less than 50% of the total contract cost, except that any items designated by the City as specialty items so performed by subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the contractor.

The value of the work sublet will be determined by multiplying the number of units of any contract item sublet by the unit price as set forth in the original contract, or by a price agreed to by the City where no unit price is included in the contract for the work sublet. Approval of the subcontract is in no way approval of the unit prices in the subcontract. The subcontractor shall perform the work described in the subcontract agreement. The contractor shall furnish the City a signed copy of the subcontract on request.

- B. No subcontracts or transfer of contract shall in any case release the contractor of his or her liability under the contract and bonds.

### **26. COOPERATION WITH OTHERS**

The contractor and subcontractors will be expected to cooperate with forces of the City, utility companies or other contractors who may be working in the area. No delay of this contract work due to avoidable conflicts will be allowed. The contractor shall, as far as possible, arrange work schedules and dispose of materials so as not to interfere with the operations of other contractors or others engaged upon the project or nearby. The contractor shall also join his or her work to that of others in a proper manner, in accordance with the spirit and intent of the contract documents and perform his or her work in proper sequence in relation to that of other contracts.

### **27. PLANS (CONTRACT DRAWINGS)**

- A. Certain plans prepared on behalf of the City, and elsewhere described and named to accompany and supplement these provisions, constitute a part of the contract documents. Such plans are agreed to be constructively attached to the contract documents, although convenience may preclude physical attachment.
- B. The City shall have the right to modify details of these plans to provide final, or checked, plans in lieu of any preliminary or unchecked plans, as the work proceeds, all of which shall be considered as plans accompanying the contract documents. The contractor shall not take advantage of any errors or discrepancies discovered in the plans, but shall report same, and the City will make or approve the necessary corrections.

- C. The contractor will be provided, at no cost, a maximum of ten sets of contract documents. Additional sets of these documents will be supplied at the cost of printing, materials and delivery.

**28. NOTICE TO PROCEED**

- A. Upon receipt of contract documents fully executed by the City, the contractor shall immediately proceed with activities pertaining to the work, such as specified coordination submittals and required conferences. The contractor shall not move onto the site until the City has issued a written Notice to Proceed.
- B. The Notice to Proceed will be issued upon completion of (a) receipt of acceptable copies of insurance policies and certificates, (b) acceptance of specified coordination submittals, i.e., Program of Construction, Schedule of Values, etc., and (c) the conclusion of initial coordination conferences. The date of Notice to Proceed shall be that on which the contractor may move onto the site, unless otherwise set forth in the said notice, which date will not be more than thirty days after the date of contract, unless City and contractor agree upon a longer time. The completion time of contract shall be the number of calendar days stated in the contract beginning with the date of Notice to Proceed or date stated therein.

**29. GENERAL PROVISIONS CONCERNING TIME**

- A. The construction herein provided for is to be completed within certain times as set forth in the contract documents. No payment shall be made to the contractor on account of any delays whatsoever, no matter by what or by whom caused, even by other contractors on the same work, or by reason of the City's acts in giving directions, in rejecting materials, methods or workmanship, or by seasons, weather or stream fluctuations. The amount provided in the contract for payment for the work items is understood and agreed to include and cover all expenses due to delays. Extensions of time for completion will be granted under the following conditions:
  - (1) If the City should, in writing, direct deferment of the beginning of work beyond the official date to begin work, or if the City should order the work closed down or temporarily discontinued, corresponding extensions of time would be granted with due consideration for changed working conditions incident to seasons and weather.
  - (2) If the final contract price, as increased by duly executed change order(s), exceeds the total contract price based on the estimated quantities as given in the bid, the time of completion will be set forward a number of working days in the proportion that such excess cost bears to the cost based on estimated quantities.
  - (3) The contractor is requested to bring to the attention of the City, in writing and during the progress of the work, the occurrence of events that the contractor may warrant extension of time under the conditions of the contract. If the contract is not completed within the time stipulated, the contractor shall, at the conclusion of the work, present a written statement to the City concerning all matters of time extensions.
  - (4) The amount of all extensions of time, for whatever reason drafted, shall be determined by the City with due consideration of working seasons and working conditions. In general, only actual and not constructive or hypothetical days of delay will be considered. The City shall have authority to draft additional extensions of time as the City may deem advisable and justifiable.
  - (5) If the contractor fails to complete the work within the time fixed by the contract or extensions thereof, and if the City shall nevertheless permit the contractor to continue and complete the same, such permission shall neither modify nor waive any liability of the contractor for damages arising from non-compliance of the work within the said time, but all liabilities shall continue in full force against the contractor.
- B. With only the exceptions outlined herein, all work under any contract shall be completed and ready for operation within the time listed in the bid after the issuance of Notice to Proceed.

**30. LIQUIDATED DAMAGES**

- A. If the contractor shall neglect, refuse, or fail to complete the work within the time set forth above, or any proper extension thereof granted by the City, the contractor shall pay to the City the amount specified in the bid documents for each day the entire work is incomplete. Said obligation of the contractor is not a penalty but is liquidated damages for loss to the City and the public, after the expiration of the time stipulated in the contract, as adjusted by duly executed change orders, and will be deducted from any money due the contractor under the contract. The contractor and the surety of record shall be liable for any and all liquidated damages.

**31. PREVAILING WAGE**

If a contract is issued from this ITB that is valued at \$75,000 or above, the contract shall be based upon payment by the contractor or contractor's subcontractors of wage rates not less than prevailing hourly wage rate for each craft or classification of workers engaged to perform the work as determined by the Industrial Commission of Missouri on behalf of the Department of Labor and industrial Relations. The prevailing wage law does not prohibit payment of more than the prevailing rate of wages nor does it limit the hours of work, which may be performed by any worker in any particular period of time. The contractor shall submit certified payrolls to the City's project manager. Prevailing wage requirements include:

- A. State of Missouri prevailing wage rates per current wage order for Jackson County, Missouri that is named in the specifications section of this solicitation. Prevailing wages must be paid by the successful contractor in accordance with labor involved for this project (Section 290.250, RSMo).
- B. The contractor will forfeit a penalty to the City of \$100 per day (or portion of a day) for each worker that is paid less than the prevailing wage rate for any work done under the contract the by contractor or by any subcontractor (Section 290.250, RSMo).
- C. The contractor and all subcontractors to the contract must require all onsite employees to complete the ten-hour construction safety training program required under Section 292.675, RSMo, unless they have previously completed the program and have documentation of having done so.
- D. The contract will forfeit a penalty to the contracting public body of \$2,500 plus an additional \$100 for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training (Section 292.675, RSMo).

- E. The City's Procurement Division will file a Prevailing Wage Project Notification form (PW-2) to the Division of Labor Standards upon issuance of the contract and retain copy in City files.
- F. While the contract work is being performed, a legible list of all prevailing wage rates must remain posted in a prominent and easily accessible place at the worksite by each contractor and subcontractor on the project (Section 290.265, RSMo).
- G. Before final payment can be made, the general contractor and all subcontractors must file an Affidavit of Compliance form PW-4 with the City of Independence. The affidavit must state the contractor has fully complied with Missouri Prevailing Wage Law, and the City must verify that the correct wages were paid. No payment can be legally made by the City to the contractor(s) until the affidavit is filed in proper form and order with the City.
- H. The City's Project Manager shall retain a copy of certified payroll in City files.

**32. BOND AND MAINTENANCE GUARANTEE**

The contractor shall provide, as stipulated in this ITB, a payment, performance, and maintenance bond for faithful performance of the contract and for persons performing labor or furnishing materials in connection therewith, with sureties satisfactory to the City and in the form provided. This bond shall be in the full amount of the contract and shall have as surety thereon a company authorized to do business in the State of Missouri, qualified as acceptable surety for United States government deposits, and acceptable to the City.

The contractor will guarantee that the equipment, materials and workmanship furnished under the contract will be as specified and will be free from defect for a period of two years from the date of final City acceptance. In addition, the equipment or materials furnished by the contractor shall, upon receipt of notice from the City, be repaired or replaced without expense to the City, and the contractor shall save the City harmless from any damage from faulty workmanship or materials installed under the contract.

**33. TAKING OVER WORK AND WITHHOLDING PAYMENTS**

- A. If the contractor shall become insolvent or be declared bankrupt, or commit any act of bankruptcy or insolvency, or if it should become evident to the City that the contractor is not making proper progress to ensure completion within the specified time, or is prosecuting the work with insufficient, inadequate, or unsuitable plant and equipment, or has failed to make good rejected work or materials, the City shall have the right, without violation of contract, after giving the contractor seven days' notice in writing, to undertake itself either by administration or by letting contract(s) to other parties, the completion of the said work which is being thus neglected, or to supplement the contractor's work and operations by supplying additional plant, equipment, materials or labor.
- B. Should the City's work cost less than the contractor would have been paid, the difference shall be paid to the contractor. However, should it cost more, the difference shall be payable by the contractor and the contractor shall, on demand, pay the amount of excess to the City. Under these circumstances and for these purposes, the City shall have the right to enter upon and take temporary possession of the plant, tools, and supplies of said contractor, or any part thereof.

In addition to the percentage of payments to be temporarily retained by the City, pending completion of the work, the City shall have the right to withhold sufficient amounts of any payment otherwise due the contractor to cover failure of the contractor to make proper payment on amounts past due and payable for just claims for labor, materials and services applied to the work of the contract, and for defective work not remedied. The City shall have the right to act as agent for the contractor in disbursing such withheld funds to the party or parties entitled thereto, and in case of such disbursements shall render the Contractor a full accounting for all such funds.

- C. The City shall not be obligated to take any such action and the failure of the City to act under this and similar clauses of the specifications shall not relieve the contractor from any responsibilities, obligations, or liabilities resulting from failure to complete the contract within the times prescribed.

**34. USE OF COMPLETED WORK**

The City may, prior to the completion of all the work performed by the contractor or acceptance thereof by the City, enter upon and use any portion of said work without any compensation or payment whatever to the contractor for any delay in the work caused by such use. Such taking possession and use shall not be deemed as acceptance of the work so taken and used, or any part thereof.

**35. SAFETY PRACTICES AND ACCIDENT PREVENTION**

- A. In the performance of the contract, the contractor and subcontractors shall comply with and observe all of the requirements of the Federal Occupational Safety and Health Act (OSHA), and all rules and regulations published in connection therewith. The contractor shall provide equipment and medical facilities as are necessary to supply first aid to anyone who may be injured in connection with the project. Provisions must also be made for the immediate removal and hospitalization in case of emergency. Anyone acting in a supervisory capacity should have authority to order such emergency action.
- B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes and the like shall be observed. Machinery and equipment and other hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are consistent with applicable law or regulation.
- C. The contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient red or yellow lights, danger signals, warning and closure signs, and shall provide watchers and take all necessary precautions for the protection of the work and the safety of the public.

**36. LIABILITIES, DAMAGES, AND ACCIDENTS**

- A. The contractor shall assume and be responsible for and shall indemnify, protect and save harmless the City against any and all claims, demands or causes of action by any party or parties whatsoever for loss, injury or damage of any kind or character, either to persons or to

property, directly or indirectly arising out of his/her operations or the acts or omissions of the contractor, any agents or workers. The contractor shall pay all judgments obtained by reason of accidents, injuries or damages in any suit or suits against the City, including all legal costs, court expenses and other like expenses; the contractor shall have the option of assuming the sole defense of such suits.

- B. The contractor shall assume all risks of loss and damage to the contractor's property and to property in his/her custody and to the property of any employees, agents, and servants, howsoever caused; all risks of damage resulting from the death of or injury to himself/herself, any agents and servants, while engaged in said work and while traveling to and from the same; and he/she agrees to hold the City free and harmless from all loss, cost and expense on account thereof, and agrees to indemnify and save harmless the City from all loss, cost and expense arising or growing out of any injury to any employee of the City caused by the negligence of the contractor or any employees; also from all loss, cost and expense arising or growing out of any injury to any person while upon the premises of the City caused by the negligence of the contractor, or any employee; also from all loss, cost and expense arising or growing out of any damage to any property, whether belonging to the City or not.
- C. All delivered materials and portions of completed work shall be deemed to have become the property of the City, but the contractor shall store materials and shall be responsible for and shall maintain partly or wholly finished work during the continuance of the contract, and until final acceptance of the work covered by the contract. If any materials or parts of the work be lost, damaged or destroyed by any means whatsoever, the contractor shall satisfactorily repair and replace the same at his or her own cost.

### 37. INSURANCE REQUIREMENTS

#### Construction

- A. Contractor shall procure, and maintain as required, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the Scope of Services/Project. The cost of such insurance shall be included in the Contractor's bid.
- B. Contractor shall maintain the following coverages and minimum limits:
  - 1. Commercial General Liability: [ISO "occurrence" form or its equivalent]
    - a. \$2,000,000 General Aggregate
    - b. \$1,000,000 per occurrence limit Bodily injury/Property damage
    - c. \$1,000,000 Personal/Advertising injury
    - d. \$1,000,000 Products & Completed operations aggregate limit.
  - 2. Business Auto Coverage: (Applicable to any *Owned, hired, and non-owned autos*) \$1,000,000 property damage / bodily injury, combined single per Accident limit – Any Auto. If no autos are owned by the proposing Contractor, a non-owned auto liability endorsement on the Commercial General Liability program is acceptable.
  - 3. Workers Compensation and Employers Liability: Workers compensation limits as required by the statutes of the state of Missouri and employers' liability limits of \$100,000/\$500,000/\$100,000. When workers compensation insurance policy is applicable "other states" coverage is required. Regardless of any minimum number of employees to trigger statutory responsibility, the City requires evidence of Workers' Compensation insurance should the Contractor have any employees.
  - 4. Umbrella Liability: minimum limit of \$1,000,000 excess of Commercial General Liability.

Exposure Limits: The above are minimum acceptable coverage limits and do not infer or place a limit on the liability of the Contractor nor has the City assessed the risk that may be applicable to Contractor. Contractor shall assess its own risks and if it deems appropriate and/or prudent maintain higher limits and/or broader coverages. The Contractor's insurance shall be primary and any insurance or self-insurance maintained by the City shall be excess for the City and not contribute with the coverage maintained by Contractor.

Coverage Limits: Coverage limits for General and Auto Liability exposures may be met by a combination of primary and umbrella policy limits.

- C. Additional Insured. The City shall be listed by ISO endorsement or its equivalent as additional insureds for the service/project as the City's interest may appear on the General Liability and any applicable Umbrella Liability. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- D. Verification of Coverage.
  - 1. A certificate of insurance accompanied by an additional insured ISO form endorsement (CG 20 10; and CG 20 37) or equivalent effecting the coverage required by the City which includes products and completed operations.
  - 2. The insurance coverages are to be provided by Missouri admitted insurance companies with a Best's rating of at least A-:VII. Those not admitted must be approved by City.
  - 3. Any self-insurance or self-insured retentions must be specified on the certificate of insurance if \$50,000 or higher per claim/loss. In addition, when self-insured the name, address, and telephone number of the claims office must be indicated on the certificate or separate attached document. Any and all deductibles or self-insurance in the above describes coverages shall be the responsibility and at the sole risk of the Contractor.
  - 4. When any of the foregoing insurance coverages are required to remain in force after final payment, additional certificates with appropriate endorsements evidencing continuation of such coverage shall be submitted along with the application for final payment.
  - 5. Any coverage provided by a Claims-Made form policy must contain a three-year tail option, extended reporting period, or must be maintained for three years post contract.
  - 6. Any deviation from the requirements set forth in this Insurance section may be allowed by the City Risk Manager subject to the City Legal Department's review and approval.

- E. Cancellation. Each insurance policy required shall not be suspended, voided, or canceled; except after thirty (30) days' advance written notice has been given to the City.
- F. Subcontractors. The Contractor may include all subcontractors as additional insured under its insurance policies or shall furnish to the City separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.
- G. Indemnity
  1. Loss: For purposes of indemnification requirements, the term "Loss" means any and all loss, damage, liability or expense, of any nature whatsoever, whether incurred as a judgment, settlement, penalty, fine or otherwise (including reasonable attorney's fees and the cost of defense), in connection with any action, proceeding, demand or claim for injury, including death, to any person or persons or damages to or loss of, or loss of the use of, property of any person, firm or corporation, including the parties hereto, which arise out of or are connected with the performance of this Agreement.
  2. Indemnification and Hold Harmless: For purposes of this Agreement, Consultant agrees to indemnify, defend and hold harmless City and its agents from any and all Loss where Loss is caused or incurred as a result of the intentional misconduct, recklessness, negligence, or other actionable fault of Consultant or its subcontractors.
  3. Comparative Fault & Contributory Negligence: It is a specific element of consideration of this Agreement that the indemnity in Section V.E.2 will apply notwithstanding the joint, concurring or contributory or comparative fault or negligence of City or any Third Party and, further notwithstanding any theory of law including, but not limited to, a characterization of City's or any Third Party's joint, concurring or contributory or comparative fault or negligence as either passive or active in nature; provided, however, that Consultant's obligation hereunder will not include amounts attributable to the fault or negligence of City or any Third Party for whom Consultant is not responsible.
  4. Damage Limitations: The indemnification obligation contained in this Agreement will not be limited by any limitation on amount or type of damages, compensation or benefits payable by or for Consultant or its subcontractors, by the minimum insurance required by this Agreement, nor under workers' compensation acts, disability benefit acts, or other employee benefit acts.
  5. Negligence by the City: Consultant is not required hereunder to defend City or its agents from assertions that they were negligent, nor to indemnify and hold them harmless from liability based on City's negligence.

Comply:\_\_\_\_\_ Exception:\_\_\_\_\_

**ACKNOWLEDGEMENT OF INSURANCE REQUIREMENTS**

By signing its proposal, respondent acknowledges that is has read and understand the insurance requirements for the proposal. Respondent also understand that the certificate of required insurance must be submitted within fifteen (15) days following the notification of award. No final contract will be signed by the City until all Certificate of Insurance are received and meet the minimums noted herein.

The contractor shall not commence work under this contract until he or she has obtained all insurance required under this section and elsewhere in the contract documents, such as exceptional insurance requirements outlined in the contract special provisions, and such insurance has been approved by the City.

**38. CHANGES IN AMOUNTS OF WORK**

The City shall have the right to increase or diminish the quantity, to change the order, or to dispense with portions of the work at any time without impairing the contract and without changing the unit prices to be paid.

In case of increase in amount of work, payment for such increase at the unit price bid for the work or the classes so increased shall be full compensation for the work done. When changes to work occur that are not covered in the contract documents and involving added cost, they will be performed only on a written change order signed by the contractor and duly processed by the City. All costs and indirect costs, including overhead, bond, and profit shall be submitted as a maximum cost figure on this change order. The Contractor shall not proceed with any work under a change order requiring additional materials or costs until written approval is given by the City.

The City may at or prior to contract award appropriate up to ten percent more than the contract value to be reserved for change orders to the project. Administrative change orders may be processed for the contract up to appropriation amounts. Administrative change orders may be for unit price extensions, cost plus additions, or negotiated prices and are to be in written form approved by the City. Change orders that exceed 10% of the total contact price require approval by the City Council, unless otherwise specified in the ITB.

**39. NEW ITEMS**

- A. The City shall have the right to require the contractor to perform work or supply materials essential to the completion of the work, of a class or type not provided for in the contract documents, or not included and covered under classifications for which price payments are provided in the contract. This work shall be added as a new line item.
- B. When a new item is ordered, it shall be paid for as the City may elect, either by a lump sum or by unit prices mutually agreed upon by the City and the contractor in writing, or, if such agreement cannot be made or the City so elects, on the basis of estimated cost to the contractor of constituent unfabricated materials, including fuel, or applied labor, and of liability insurance for labor, plus 20% thereof to cover and include contractor's profit, superintendence, overhead, and indirect expense, including interest on borrowed money and premiums on bonds, and for the use of plant, equipment, tools, and appliances. Where manufactured or fabricated materials or articles are to be purchased for installation or some of the work is done by subcontract the contractor shall estimate 5% over and above the



contractor's costs of such items instead of 20%. For such work, plant and tools shall be provided of the same general character as employed for similar kinds of operations on the project.

- C. The contractor shall not begin any work for which new items are provided in the contract without written approval from the City.

#### 40. NOTICE OF CLAIMS FOR EXTRA COMPENSATION

Should any conditions arise which in the contractor's opinion will require any claims or demands for extra or additional compensation above that fixed by the contract, or on which he or she contemplates bringing claims for such extra compensation, the contractor shall promptly and before incurring any expenses, notify the City in writing of the conditions and circumstances and that such claims are anticipated. The contractor agrees that any claims made without such advance notice, and not presented in such a way as to enable the City to observe conditions as they occur and to verify expenses as they occur and to determine with certainty the correctness of such claims and of the expenses involved, are waived and shall be null and void. The contractor shall not proceed with any work requiring added compensation until written approval is given by the City.

#### 41. ACCEPTANCE OF WORK

No part of the construction will be finally accepted until the all construction is completed in its entirety. Upon final completion of the work, the City will make final inspection and when it is found that the contractor has completed the entire contract in accordance with the contract documents, the City will thereupon issue a written order of acceptance and the final pay estimate will be rendered.

#### 42. METHODS OF PAYMENT

- A. Lump Sum Payment: When so indicated in the ITB, payment will be made for the entire contract upon completion, final inspection, approval of as-built record plans and acceptance of the work.
- B. Partial (Progress) Payments: Payments will be made at unit prices shown in the bid with work in place as described in the contract documents as a basis for making monthly pay estimates. Before the first application for payment, the contractor shall submit to the City a schedule of values of the various portions of the work, including quantities, if required by the City, aggregating the total contract sum, divided according to subcontractors and prepared in such form as the City and the contractor may agree upon, and supported by such data to substantiate its correctness as the City may require. Each item in the schedule of values shall include its proper share of overhead and profit and this schedule, when approved, shall be used only as a basis for the contractor's application for payment.

At least 15 calendar days before each payment will fall due, the contractor shall submit to the City an itemized application for payment, supported to the extent required by the City by receipts or vouchers showing payments for materials and labor, payments to subcontractors, and such other evidence of the right to payment as the City may direct. On or about the first day of the month, the City will make an estimate of the value of the total work done and shall pay to the contractor, within 15 days, 90% of the amount of such estimated sum, less the sum of all previous payments. No payments will be made on account of materials not to be incorporated in the work. Progress payments will be made to the contractor based on 90% of the value of the work satisfactorily completed and for the unused material on hand at the time of the progress estimate. After the contract is 50% completed, payments may be increased by the full value of the additional work satisfactorily completed. The retained percentage will be withheld by the City until final payment is authorized, except that when the work is stated as substantially complete in writing, the City may reduce the retained percentage to an amount equal to two hundred percent of the remaining minor items to be completed.

As directed in writing by the City, adjustments may be made in the estimates for quantities shown under each bid item at the unit prices named in the bid, so long as these adjustments do not result in an excess of the total contract amount.

It is agreed by the Contractor that any payments or advancements of funds to be made to the contractor under provisions of this agreement shall not be assigned or pledged by contractor unless consent in writing is first obtained from the City.

- C. Force Account may be applied under the following conditions:
- (1) Force Account work will be measured and paid for on a contractor's cost plus a percentage basis.
  - (2) The contractor's cost is hereby defined and shall include the amounts required to pay subcontractors plus the costs of contractor's as follows:
    - a. Labor Costs
      - (i) The payroll cost for all workers such as foremen, mechanics, craftsmen, and laborers.
      - (ii) All incidental labor expenses incurred as a direct result of the performance of the work, including payroll taxes, worker's compensation, pension, and retirement allowances and social security insurance or other regular payroll charges on same.
    - b. Material and Equipment Costs
      - (i) The cost of all materials and equipment required, delivered to the construction site that are not furnished by City or others.
      - (ii) Sales and use taxes applicable to such materials and equipment.
    - c. Supplemental Costs
      - (i) Rental for all power-driven equipment at agreed-upon rates shall be charged against Force Account work only for the actual time which the equipment is used specifically therefore.
      - (ii) Transportation charges necessarily incurred in connection with such equipment, which is not already on the site.
      - (iii) Cost of power, fuel, lubricants, and water required for such equipment (may be included in agreed-upon rate).
      - (iv) Additional cost for surety bonds, liability and property damage, and other insurance required, where cost is necessarily increased by coverage of the Force Account Work.
    - d. The above definitions and requirements apply equally to work done by subcontractors, suppliers and manufacturers.
    - e. The percentages, which shall be added to the several items of contractor's cost, are as follows:
      - (i) Amounts paid to subcontractors - 5%

- (ii) Labor costs - 10%
- (iii) Material and equipment costs - 10%
- (iv) Supplemental costs - 0%

- (3) The above percentages shall be understood to include all other costs and full compensation for profit, overhead, superintendence, field office expense and all other elements of cost not included in the "contractor's cost," as herein defined.
- (4) The contractor shall keep and present in an acceptable form an accurate account with vouchers of the several items of cost, including those of subcontractors performing Force Account work.

D. Late Payment Clause: If the City fails to make a monthly pay estimate thirty (30) days after approval, in addition to other remedies available to the contractor, then interest shall be added to each payment at the maximum legal rate, commencing on the first day after said payment is due and continuing until the payment is received by the contractor. The legal rate of interest shall be as specified in R.S.Mo 34.057.

**43. ACCEPTANCE AND FINAL PAYMENT**

Upon determination by the City that all work has been completed in accordance with the contract, and approval of as-built plans submitted for record, the City will accept the project as such by an approved Letter of Acceptance. When the work has been so completed and certified by the City, a final estimate will be executed and submitted which will provide payment to the contractor for the entire sum due as set forth in the contract documents, including all amounts previously retained by the City. All prior partial estimates and payments shall be subject to correction by the City in this final estimate and payment. Payments for the work will be made by the City's credit card, which is the preferred method of payment with no added fees; or check by the City of Independence, Missouri, as herein specified.

**44. MISSOURI SUNSHINE LAW**

The bidder acknowledges and agrees that the City is bound by the Missouri Open Records Law (Sunshine Law) and cannot protect information for the sole reason that it is marked "confidential" or "proprietary". All information submitted in response to this ITB shall be available for public review in accordance with all federal, state and local laws after: 1) posting of the Notice of Intent to Award; 2) a contract has been executed; or 3) all bids have been rejected. Requests must be submitted in writing to the Procurement Manager, City of Independence.

**45. FIRM PRICES**

The bidder warrants that prices quoted in their bid will be firm for acceptance for a period of not less than 120 days from the bid opening date unless otherwise specified in the bid document. Such prices will remain firm for the period of time specified in the purchase order or contract. The City shall not be responsible to pay surcharges or any other fees not disclosed in the bid and agreed upon between the parties.

**46. GENERAL GUARANTY AND WARRANTY**

The contractor warrants that all materials, fixtures, and equipment furnished by the contractor and his subcontractors shall be new, of good quality, and of good title, and that the work will be done in a neat and workmanlike manner. The contractor also guarantees the workmanship and materials for a minimum period of one year from the date of final acceptance of all the work required by the contract. Furthermore, the contractor shall furnish the City with all manufacturers' and suppliers' written guarantees and warranties covering materials and equipment furnished under the contract.

**47. TERMINATION**

City may terminate or suspend performance of a contract for City's convenience upon written notice to contractor. City shall pay contractor for all the services performed till the date of the termination by the City or suspension expenses.

A contract may be terminated by either party upon written notice in the event of substantial failure by the other party to perform in accordance with the terms of the contract. The nonperforming party shall have ten (10) calendar days from the date of the termination notice to cure or to submit a plan for cure acceptable to the other party. Risk to persons or property shall result in immediate termination of the contract.

**48. AVAILABILITY OF FUNDING**

Any resulting contract or purchase order is contingent upon the availability of funding and allocation of City funds. The City may cancel any contract or purchase order immediately by giving written notice to the contractor, in the case of a reduction or elimination of funds or funding for any project, commodity, or service.

**49. CHOICE OF LAW**

Any dispute related to a contract resulting from this ITB shall be governed by the laws of the State of Missouri. The City and the contractor agree that the performance of a contract will be deemed to have occurred in the State of Missouri and that contractor's performance under a contract will be deemed the transaction of business in Missouri. Jurisdiction and venue for any claim or cause of action arising under a contract shall be exclusively in the Sixteenth Judicial Circuit of Missouri and the contractor submits to personal jurisdiction of and waives any personal jurisdiction or inconvenient forum objection to that court.

**50. PRECEDENCE OF DOCUMENTS**

The ITB including the terms and conditions, the successful bidder's (contractor) response and written quote, and purchase order shall constitute the entire contract for each project. If these General Terms & Conditions be in conflict with any attached Special Conditions, the Special Conditions will supersede the General Terms & Conditions. In case of a discrepancy, the purchase order shall take precedence over the ITB and the ITB shall take precedence over the contractor's response and written quote for each project.

A. ANTICIPATED SCHEDULE

The outage window is anticipated to be September 1, 2022 – May 31, 2023. Bidder must provide an estimated schedule for construction in the outage window with bid.

B. QUALIFICATIONS OF BIDDERS

1. Bidders shall submit information as follows:
  - a. Bidder must complete the entire bid form and the bid summary sheet.
  - b. Bidder shall supply a project schedule.
  - c. Bidder shall provide an electronic copy of their Safety Program.
  - d. Bidders shall submit with their proposal a minimum of five (5) references. Reference list shall include contacts and phone numbers where previous work scopes required similar services to be provided.
  - e. Bidder shall have an Experience Modification Rating (EMR) of 1.0 or less and provide supporting documentation from their underwriter.
  - f. Bidder shall provide qualifications of the firm, subcontractors, and list key personnel to be assigned to the project to demonstrate its capability to complete the project in accordance with the plans and specifications and the contract timeline.
  - g. Bidder shall complete the Affidavit of Compliance with Immigration Law, Affidavit of Non Collusion, Affidavit of Completion of OSHA Construction Safety Program.
  - i. The payment, performance and maintenance bond must be provided after award of the contract.
  - h. Bidder shall submit in writing any exceptions to the scope of work/specifications, terms & conditions or contract. Exceptions must be submitted as a separate page that clearly describes each exception.

C. LIQUIDATED DAMAGES

For each and every day that the work and services and any specified portions thereof are not completed after the time or times fixed for completion in the Contract Documents, the Contractor shall pay the City, not as a penalty, but as liquidated damages, \$500 (Five Hundred Dollars) for each and every day during which the completion of the work and services and any specified portions thereof are delayed.

Because of the difficulty in computing the actual damages which will result from failure to complete the work and services and any specified portions thereof on time, the said amount or amounts of liquidated damages are hereby estimated, agreed upon, and determined in advance by the parties hereto as a reasonable evaluation of the actual damages which the City will suffer for each and every day during which the completion of the work and services and any specified portions thereof are delayed beyond the time or times herein fixed.

Such monies due to the Contractor or to become due to the Contractor, at or after the time or times fixed in the Contract Documents for the work and services and any portion thereof, may be retained by the City, as may be necessary to pay said liquidated damages; the Contractor shall immediately pay the deficiency to the City. Such deductions or amounts retained by the City shall not in any degree release the Contractor from further obligation and liability with respect to fulfilling the entire Contract.

Nothing contained herein shall preclude claims by the City for damages caused by Contractor errors, omissions, or negligence unrelated to delay in completing the construction within the construction time or construction times fixed for completion in the Contract Documents.

D. MISCELLANEOUS

1. The method of payment is Partial (Progress) Payments as described in Section 41 of the General Terms & Conditions and Response Instructions Construction. Additional clarifications are made in the detailed specifications.
2. Please list a contact person for questions regarding the bid response, if different than the listed authorized agent on the cover sheet.

**SUBSTATION A CONSTRUCTION**

Contractor to fill in all line-item columns for items left blank.  
 For line-item descriptions requesting a "price adjustment" only insert unit prices; do not include the "extended bid price".

Item No.	Description	Qty.	Unit	Unit Price Labor	Unit Price Materials	Labor & Materials	Extended Bid Price Labor & Materials
A1-1	Mobilization (Setting Up Facilities, Utilities and Controls), Site Office and Security	1	Lot	\$ 28,718.86	\$ 0.00	28,718.86	28,718.86
A1-2	Removal of existing transformers "T1" and "T1A" and associated control cabling	1	Lot	\$ 254,035.76	\$ 0.00	254,035.76	254,035.76
A1-3	Removal of existing transformer deluge system	1	Lot	\$ 20,086.01	\$ 0.00	20,086.01	20,086.01
A1-4	Removal of transformer deluge system foundations	1	Lot	\$ 58,349.58	\$ 0.00	58,349.58	58,349.58
A1-5	Removal of medium-voltage bus duct associated with transformers "T1" and "T1A"	1	Lot	\$ 6,695.34	\$ 0.00	6,695.34	6,695.34
A1-6	Covering and weather-sealing of bus duct entrance at the exterior wall of the Blue Valley Power Plant	1	Lot	\$ 3,347.67	\$ 0.00	3,347.67	3,347.67
A1-7	69kV 20MVAR Capacitors Bank Installation	1	Lot	\$ 46,867.35	By Others	46,867.35	46,867.35
A1-8	Capacitors Bank Protection Panel Installation	1	Lot	\$ 20,524.90	By Others	20,524.90	20,524.90
A1-9	69kV 20MVAR Capacitors Bank Foundation Installation	1	Lot	\$ 16,881.56	\$ 0.00	16,881.56	16,881.56
A1-10	Below Grade Conduits, Fittings and Stub-ups	1	Lot	\$ 14,647.08	\$ 2,658.40	17,305.48	17,305.48
A1-11	Overhead Conductor, Fittings, and Connectors	1	Lot	\$ 13,390.67	\$ 0.00	13,390.67	13,390.67
A1-12	Control and power cable	1	Lot	19,108.02	6,953.96	26,061.98	26,061.98
A1-13	Ground Grid Conductor, Fittings, and Connectors	1	Lot	\$ 11,145.89	\$ 3,485.29	14,631.18	14,631.18
A1-14	Indoor Cable Tray Installation	1	Lot	7,696.35	2,800.92	10,497.27	10,497.27
A1-15	AC Lighting Panel Installation		Lot	11,206.15	4,078.26	15,284.41	15,284.41
A1-16	Identification Tags	1	Lot	\$ 3,347.67	\$ 0.00	3,347.67	3,347.67
A1-17	Testing	1	Lot	\$ 27,795.73	\$ 0.00	27,795.73	27,795.73

TOTAL THIS PAGE 583,821.42

Item No.	Description	Qty.	Unit	Unit Price Labor	Unit Price Materials	Labor & Materials	Extended Bid Price Labor & Materials
BLANK LINE ITEMS BELOW FOR OTHER ITEMS ASSIGNED BY CONTRACTOR							

	TOTAL THIS PAGE	0.00
	TOTAL SUBSTATION A EXTENDED LABOR & MATERIALS	583,821.42

**PRICE ADJUSTMENTS SUBSTAITON A - ADDITIONS**

<b>Item No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Price Labor</b>	<b>Unit Price Materials</b>	<b>Labor &amp; Materials</b>	<b>Extended Bid Price Labor &amp; Materials</b>
PA-1	Price Per Cubic Yard of Earthwork Excavation, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 246.63	\$ 0.00	246.63	246.63
PA-2	Price Per Cubic Yard of Earthwork Backfill, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 301.43	\$ 0.00	301.43	301.43
PA-3	Price per Cubic Yard of Crushed Rock Surface Regrading In Accordance With These Construction Documents, If Price Per Ton Please Specify	1	Cu. yd	\$ 301.43	\$ 0.00	301.43	301.43
PA-4	Price Per Yard of Reinforced Concrete, Supplied And Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 2,466.28	\$ 0.00	2,466.28	2,466.28
PA-5	4/0 Copper Ground Wire Price Adjustment	10	ft	\$ 27.54	\$ 6.09	33.63	336.30
PA-6	Cadweld Connection: Cable to Riser	1	Ea	\$ 171.17	\$ 30.47	201.64	201.64
PA-7	Cadweld Connection: Cable to Ground Rod	1	Ea	\$ 171.17	\$ 30.47	201.64	201.64
PA-8	Control Cable 2/C #10	100	Ft.	\$ 4.29	\$ 1.56	5.85	585.00
PA-9	Terminations Control Cable 2/C #10	2	Term.	\$ 21.00	\$ 6.70	27.70	55.40
PA-10	Control Cable 4/C #10	100	Ft.	\$ 5.87	\$ 2.13	8.00	800.00
PA-11	Terminations Control Cable 4/C #10	8	Term.	\$ 21.00	\$ 6.70	27.70	221.60
PA-12	Control Cable 12/C #12	100	Ft.	\$ 9.66	\$ 3.52	13.18	1,318.00
PA-13	Terminations Control Cable 12/C #12	24	Term.	\$ 21.00	\$ 6.70	27.70	664.80
PA-14	Control Cable 1/C 4/0	10	Ft.	\$ 10.15	\$ 3.69	13.84	138.40
PA-15	Terminations Control Cable 1/C 4/0	2	Term.	\$ 83.99	\$ 26.81	110.80	221.60
PA-16	Control Cable 2 pair #18	1	Ft.	\$ 7.66	\$ 2.79	10.45	10.45
PA-17	Terminations Control Cable 2 pair #18	1	Term.	\$ 21.00	\$ 6.70	27.70	27.70
PA-18	Control Cable 8 pair #18	1	Ft.	\$ 8.80	\$ 5.42	14.22	14.22
PA-19	Terminations Control Cable 8 pair #18	1	Term.	\$ 21.00	\$ 6.70	27.70	27.70
PA-20	Communications COAX Cable	1	Ft.	\$ 8.80	\$ 5.42	14.22	14.22
PA-21	Terminations COAX Cable	1	Term.	\$ 21.00	\$ 6.70	27.70	27.70
PA-22	2" PVC Sch. 40 Conduit	10	Ft.	\$ 169.66	\$ 18.28	187.94	1,879.40
PA-23	2" RGS Conduit	1	Ft	\$ 149.50	\$ 42.98	192.48	192.48
PA-24	Installation of Bolted Fitting	1	Ea	\$ 205.52	\$ 0.00	205.52	205.52
PA-25	Installation of Welded Fitting	1	Ea	\$ 274.03	\$ 0.00	274.03	274.03

**PRICE ADJUSTMENTS SUBSTAITON A - DEDUCTIONS**

<b>Item No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Price Labor</b>	<b>Unit Price Materials</b>	<b>Labor &amp; Materials</b>	<b>Extended Bid Price Labor &amp; Materials</b>
PD-1	Price Per Cubic Yard of Earthwork Excavation, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 246.63	\$ 0.00	246.63	246.63
PD-2	Price Per Cubic Yard of Earthwork Backfill, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 301.43	\$ 0.00	301.43	301.43
PD-3	Price per Cubic Yard of Crushed Rock Surface Regrading In Accordance With These Construction Documents, If Price Per Ton Please Specify	1	Cu. yd	\$ 301.43	\$ 0.00	301.43	301.43
PD-4	Price Per Yard of Reinforced Concrete, Supplied And Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 2,466.28	\$ 0.00	2,466.28	2,466.28
PD-5	4/0 Copper Ground Wire Price Adjustment	10	ft	\$ 27.54	\$ 6.09	33.63	336.30
PD-6	Cadweld Connection: Cable to Riser	1	Ea	\$ 171.17	\$ 30.47	201.64	201.64
PD-7	Cadweld Connection: Cable to Ground Rod	1	Ea	\$ 171.17	\$ 30.47	201.64	201.64
PD-8	Control Cable 2/C #10	100	Ft.	\$ 4.29	\$ 1.56	5.85	585.00
PD-9	Terminations Control Cable 2/C #10	2	Term.	\$ 21.00	\$ 6.70	27.70	55.40
PD-10	Control Cable 4/C #10	100	Ft.	\$ 5.87	\$ 2.13	8.00	800.00
PD-11	Terminations Control Cable 4/C #10	8	Term.	\$ 21.00	\$ 6.70	27.70	221.60
PD-12	Control Cable 12/C #12	100	Ft.	\$ 9.66	\$ 3.52	13.18	1,318.00
PD-13	Terminations Control Cable 12/C #12	24	Term.	\$ 21.00	\$ 6.70	27.70	664.80
PD-14	Control Cable 1/C 4/0	10	Ft.	\$ 10.15	\$ 3.69	13.84	138.40
PD-15	Terminations Control Cable 1/C 4/0	2	Term.	\$ 83.99	\$ 26.81	110.80	221.60
PD-16	Control Cable 2 pair #18	1	Ft.	\$ 7.66	\$ 2.79	10.45	10.45
PD-17	Terminations Control Cable 2 pair #18	1	Term.	\$ 21.00	\$ 6.70	27.70	27.70
PD-18	Control Cable 8 pair #18	1	Ft.	\$ 8.80	\$ 5.42	14.22	14.22
PD-19	Terminations Control Cable 8 pair #18	1	Term.	\$ 21.00	\$ 6.70	27.70	27.70
PD-20	Communications COAX Cable	1	Ft.	\$ 8.80	\$ 5.42	14.22	14.22
PD-21	Terminations COAX Cable	1	Term.	\$ 21.00	\$ 6.70	27.70	27.70
PD-22	2" PVC Sch. 40 Conduit	10	Ft.	\$ 169.66	\$ 18.28	187.94	1,879.40
PD-23	2" RGS Conduit	1	Ft	\$ 149.50	\$ 42.98	192.48	192.48
PD-24	Installation of Bolted Fitting	1	Ea	\$ 205.52	\$ 0.00	205.52	205.52
PD-25	Installation of Welded Fitting	1	Ea	\$ 274.03	\$ 0.00	274.03	274.03

## BID SUMMARY SHEET

All bid pricing shall be stated as a maximum not-to-exceed price which includes all mobilization, demobilization, transportation, labor, technical expertise, equipment, materials and all other expenses, including administrative costs, by bidder and any necessary subcontractors needed for completion of each particular portion of the work. Pricing will not include any owner supplied labor or materials set out in the specifications.

Vendor: Black & McDonald

Project: Bid ITB#21110 - Substation A Capacitor Bank (REV 3-8-22)

1. Base Bid	\$ <u>583,821.42</u>
a. Equipment Cost	\$ <u>69,533.13</u>
b. Labor Cost	\$ <u>275,155.04</u>
c. Sub-Contractor Cost	\$ <u>239,133.25</u>
i. Percentage of Project	<u>41%</u>
d. Mobilization Cost	\$ <u>28,661.18</u>
i. Lead Time	<u>Dependent on material availability.</u>
e. Performance Bond Cost	\$ <u>2,977.49</u>
2. Force Account Allowance (Total Cost * 10%)	\$ <u>58,382.14</u>
3. Total Not-To-Exceed Cost	\$ <u>642,203.56</u>



Black McDonald  
Tentative Project Schedule  
IPL Sub A Capacitor Bank Project

Work Description	Dates ->	09/01/2022	09/08/2022	09/15/2022	09/22/2022	09/29/2022	10/06/2022	10/13/2022	10/20/2022	10/27/2022	11/03/2022	11/10/2022	11/17/2022	11/24/2022	12/01/2022	12/08/2022
Tentative Completion of Sub K																
Mobilization																
Construction																
General Cleanup																
Demobilization																

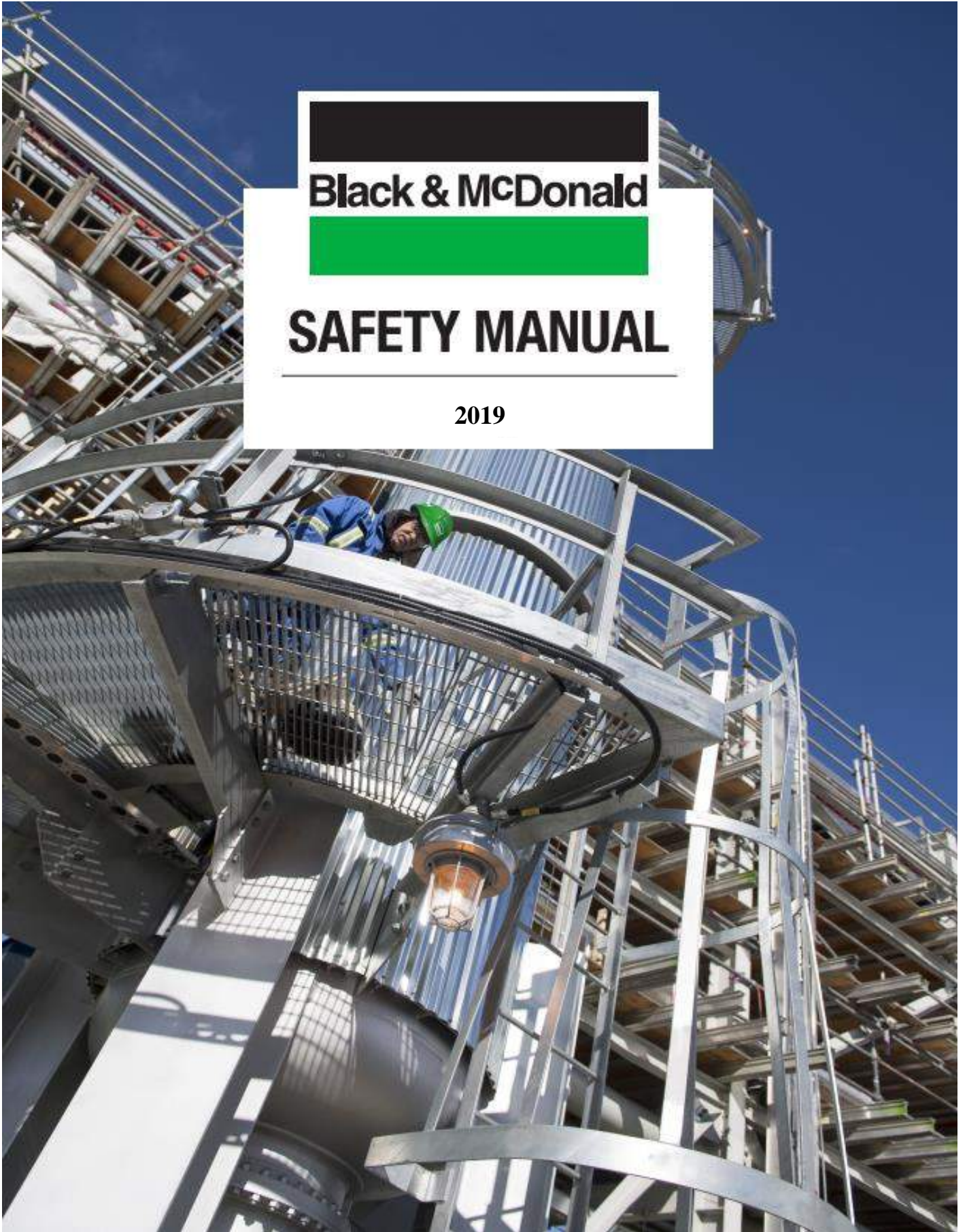




**Black & McDonald**

**SAFETY MANUAL**

2019



	<b>HEALTH, SAFETY &amp; ENVIRONMENTAL MANAGEMENT MANUAL</b>	<b>Rev. 5</b>	Page 1 of 163
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This manual is intended for use by all Black & McDonald Limited employees, affiliates and subcontractors

The information presented is intended to provide guidance and direction in the implementation of Black & McDonald Limited policies and standards. This manual is also a resource for the development and implementation of Black & McDonald Limited's Health, Safety & Environmental Management System.

This manual is not a definitive guide to government acts, codes, regulations, standards or policies. The appropriate acts, codes, regulations, standards and policies should be consulted.

Please contact your HSE Professional for further guidance, direction and assistance.

***Ray Pleasance***  
***Director, Corporate Safety***

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**Health, Safety & Environmental Management Manual**

**Black & McDonald Limited**  
**2 Bloor St E., Suite 2100**  
**Toronto, ON**  
**M4W 1A8**

Rev.#	Date	Prepared by:	Reviewed by:
5	01/31/19	<u>Dan Ransom</u> <u>01/31/2014</u> <span style="float: right;"><b>Date</b></span>	<u>Ray Pleasance</u> <u>01/31/2014</u> <span style="float: right;"><b>Date</b></span>
		Approved by:	
		<u>Ray Pleasance</u> <u>01/31/2014</u> <span style="float: right;"><b>Date</b></span>	<u>Ian McDonald</u> <u>01/31/2014</u> <span style="float: right;"><b>Date</b></span>

**Confidentiality**

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**HEALTH, SAFETY &  
ENVIRONMENTAL MANAGEMENT  
MANUAL**

**Rev. 5**

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**REVISION LIST**

<b>REV #</b>	<b>DESCRIPTION OF CHANGE</b>	<b>REVISION PREPARED BY</b>	<b>AMENDMENT DATE</b>
0	Initial Issue	Dan Ransom	01/31/2014
1	1.5 HSE Goals	Dan Ransom	06/18/2015
2	2016 Updates	NASC	10/20/2015
2	Health, Safety and Environmental Record Retention Guideline- NASC Guideline	NASC	6/22/2016
3	2017 Updates	NASC	01/31/2017
4	2018 Updates	NASC	10/24/2018
5	2019 Updates	CSC	01/31/2019



## ACRONYMS

AIAOD	Act respecting Industrial Accident and Occupational Diseases
AOHS	Act respecting Occupational Health and Safety
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CEPA	Canadian Environmental Protection Act
CSA	Canadian Standards Association
CNSA	Canadian Nuclear Safety Association
COR	Certificate of Recognition
CPR	Cardio Pulmonary Resuscitation
CSST	Commission de la santé et de la sécurité du travail
EMS	Emergency Management System
EPEA	Environmental Protection & Enhancement Act
EPOG	Environmental Practices & Operating Guidelines
FA	First Aid
FAF	Functional Abilities Form
PJHA	Pre-Job Hazard Assessment
FLRA	Field Level Risk Assessment
HEPA	High-Efficiency Particulate Air Filter
HIERAC	Hazard Identification Elimination, Risk Assessment & Control
HSE	Health, Safety & Environmental
IH	Industrial Hygiene
IRS	Internal Responsibility System
JDE	JD Edwards Enterprise One Oracle Software/Database
JHA	Job Hazard Assessment
JSA	Job Safety Analysis
JHSC	Joint Health & Safety Committee
KRA	Key Result Areas
LTIF	Lost-Time Injury Frequency
MA	Medical Aids
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Health & Safety
NASC	National Safety Committee
OH&S Act	Ontario Health and Safety Act
OSHA	Occupational Safety & Health Association (USA)
PDA	Physical Demands Analysis
PPE	Personal Protective Equipment
PSP	Project Safety Plan
SMT	Senior Management Team
SOP	Standard Operating Procedures
SWP	Safe Work Practices
TDG	Transportation of Dangerous Goods
TOC	Table of Contents
TRIR	Total Recordable Injury Rate
TSSA	Technical Standards & Safety Authority
TTT	Train-the-Trainer
VPP	Voluntary Protection Program
WCB	Worker's Compensation Board
WHMIS	Workplace Hazardous Materials Information System
WHSCC	Workplace Health, Safety & Compensation Commission
WSIB	Workplace Safety & Insurance Board (Ontario)

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## DEFINITIONS

**Hazard**— a source, situation, or act with the potential for harm in terms of human injury or ill health, damage to property or equipment, environment or a combination of these.

**Hazard Identification** - the process of finding, listing, and characterizing hazards.

**Risk**— the combination of the likelihood of an occurrence of a hazardous event or exposure(s) and the severity of injury, ill health, property, equipment, and/or environmental damage that can be caused by the event or exposure(s).

**Note:** These two components of risk are of equal importance; and either or both may play a role in the subsequent risk control/mitigation measures to be adopted.

**Likelihood**— the chance of something happening.

**Note:** *In risk assessment terminology, the word “likelihood” is used to refer to the chance of something happening, whether defined, measured, or determined objectively or subjectively, qualitatively or quantitatively, and described using general terms or mathematically (e.g., a probability or a frequency over a given time period). Degrees of belief about likelihood can be chosen as classes or ranks:*

- a) rare/unlikely/moderate/likely/almost certain; or
- b) Incredible/improbable/remote/occasional/probable/frequent.

**Risk Assessment**— the overall process of hazard identification, risk analysis, and risk evaluation.

**Risk Analysis**— a process for comprehending the nature of hazards and estimating the level of risk.

**Note:**

1. Risk analysis provides a basis for risk evaluation and decisions about risk control.
2. Information can include current and historical data, theoretical analysis, informed opinions, and the concerns of stakeholders.
3. Risk analysis includes risk estimation.

**Risk Criteria**— the terms of reference against which the significance of risk is evaluated.

**Note:**

1. Risk criteria are based on organizational objectives and external and internal contexts.
2. Risk criteria can be derived from standards, legal requirements, policies, and other requirements.

**Risk Estimation**— a process used to assign values to the likelihood and consequences of a risk.

**Note:** *Risk estimation can consider costs, benefits, the concerns of stakeholders, and other variables, as appropriate for risk evaluation.*

**Risk Evaluation**— the process of determining the significance of the risk and making decisions concerning the allocation of resources to control the risk.

**Risk Reduction**— actions (i.e., use of preventive and protective measures) taken to lessen the likelihood of harm, the severity of harm, or both.

**Risk Control**— protective or preventive actions implemented to reduce risk.

**Note:** *Risk control also involves monitoring, re-evaluation, and compliance with decisions.*



**Risk Transfer**— the action of passing on risk associated with a product, process, or service from one party to another.

**Acceptable Risk**— a risk reduced to a level that can be tolerated by the organization having regard to its legal obligations and its own HSE policy.

**Intolerable Risk**— a risk the organization feels carries such a high probability of serious or catastrophic consequences that the activity should not be carried out in its current manner until controls can be implemented to reduce the risk to a tolerable level.

**Reasonably Practicable**— the degree of risk in a particular situation must be balanced against the time, trouble, cost and physical difficulty of taking measure to avoid the risk. The greater the risk, the more likely it is that it is reasonable to go to very substantial expense, trouble, and intervention to reduce it. But, if the consequences and extent of risk are small, insistence on great expense would not be considered reasonable.

**Residual Risk**— the risk remaining after a hierarchy of controls has been implemented

**Personal Protective Equipment (PPE)**— anything designed to be worn, held, or carried by an individual for protection against one or more hazards.

**Lifecycle**— human interaction during the entire lifecycle of the product, process, or service with respect to the following:

- Design;
- Construction or development of a process;
- Transport, assembly, and installation;
- Commissioning or setting to work;
- Intended use of the product, process, or service; and
- Decommissioning, dismantling and, as far as safety is concerned, disposal.

**Legal Requirements**— in any country the requirements of applicable federal, provincial/territorial/state, and municipal HSE laws, regulations, and bylaws; and, where applicable, an organization's collective agreements that relate to HSE.

**Code of Practice**— a document that recommends practices or procedures for the design, manufacture, installation, maintenance, or utilization of equipment, structures, or products.

***Note:** A code of practice can be a Standard, a part of a Standard, or other document.*

**Record**— a document that states results achieved or provides evidence of activities performed

***Note:** Under some circumstances electronic documentation can meet documentation requirements.*

**Stakeholders**— persons or organizations that can affect, be affected by, or perceive themselves to be affected by decisions or activities related to HSE hazards and risks.

**Worker representative**— a non-managerial worker who is

- a) A member of the workplace health and safety committee;
- b) A representative of other workers according to the requirements of law or collective agreements; or
- c) Selected by non-managerial workers for other reasons.

	<b>HEALTH, SAFETY &amp; ENVIRONMENTAL MANAGEMENT MANUAL</b>	<b>Rev. 5</b>	<b>Page 7 of 163</b>
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**Electric Transmission And Distribution Construction Minimum Requirements**

**Section: B**

**Project Experience**

**161kV Transmission Construction (De-Energized)**

Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
City of Gardner, KS	John Krievins 913-207-2024	161kV Structure Replacement	<b>Replace</b> (1) 161kV Structure (Located Between Sub 1 & Sub 2)	2018	Chris Saban
City of Gardner, KS	John Krievins 913-207-2024	161kV T-Line Maintenance - Sub 1 to Sub 2	<b>Maintenance</b> QA/QC Existing 161kV Transmission Line From Sub 1 To Sub 2 - Check/Tighten Hardware, Add Pole Caps, etc.	2018	Chris Saban
Kansas City Power & Light	Craig Rice 816-214-3963	Troost 161kV Cut-In	<b>Install</b> (5) Steel Structures, Cut In 1192 ACSR Conductor To New Substation	2013	Chris Saban
Kansas City Power & Light	Craig Rice 816-214-3963	Bank of America 161kV Cut-In	<b>Install</b> (7) Steel Structures, (4) Foundations, Cut In 1192 ACSR Conductor To New Substation	2013	Chris Saban

**69kV Transmission Construction (De-Energized)**

Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Northwest Electric COOP	John Kaiser 816-262-4838	Pittsville to Odessa Transmission Line Maintenance & OPGW Replacement (15 Miles)	<b>Install</b> (80) X-Braces on Existing 69kV Structures <b>Remove</b> Old 3/8" Static Wire	2016	Mike Lies
Kansas City Power & Light	Mark Rothmier 816-325-7446	Sub "F" 69kV Rebuild (1.5 Miles) - Double Circuit	<b>Install</b> Rebuild 1.5 miles of double circuit 69kV with new steel mono-poles and 4 foundations	2013	Chris Saban
Kansas City Power & Light	Mark Rothmier 816-325-7446	Shrank Rd 69kV (2 Miles) - Double Circuit	<b>Install</b> (26) Steel Structures, (4) Concrete Foundations, (20,925') 556 ACSR Conductor <b>Transfer</b> (43,500') 556 ACSR Conductor, All 12kV Underbuild <b>Remove</b> (26) Wood Poles, (20,300') 556 ACSR Conductor	2012	Mark Haus

**13.2kV 600 Amp Underground Construction**

Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Kansas City Power & Light	Tom Cree 816-245-4076	Nieman Rd - Shawnee Mission Pkwy to 55th St - OH to UG Conversion	<b>Install</b> (3) Three Phase 600A Enclosure, (20) 15kV Padmount Switchgears, (6,900LF) Three Phase 1000MCM Cable, (48) Splices, (138) T-Bodies, (12) OH Riser Terminations	2019	Matt Arne
Kansas City Power & Light	Tom Cree 816-245-4076	NUCOR - Sedalia Substation Feeder	<b>Install</b> (2,250') Three Phase 1500MCM Cable, (3) T-Body Terminations, (18) Splices, (18) OH Riser Terminations, (63) Switchgear High Bay Terminations	2019	Andy Franke
Kansas City Power & Light	Tom Cree 816-245-4076	Lake Winnebago - Feeder Extension	<b>Install</b> (2,000') Three Phase 1000MCM Cable, (15) Splices, (13) OH Riser Terminations, (3) Switchgear High Bay Terminations	2018	Andy Franke
Kansas City Power & Light	Alex Berkovich 816-245-3916	AG Spanos - 115th & Lamar - OH to UG Conversion	<b>Install</b> (2,888') Three Phase 1000MCM Cable, (24) T-Body Terminations, (30) Splices, (6) OH Riser Terminations, (2) Padmount Switchgears, (1) Padmount Capacitor Bank <b>Remove</b> (2,888') Three Phase 1000MCM Cable	2018	Andy Franke
Kansas City Power & Light	Tom Cree 816-245-4076	KCMO Round Grove Pump Station - Feeder Cable Replacement	<b>Install</b> (1,372') Three Phase 1000MCM Cable, (2) Splices <b>Remove</b> (1,172') Three Phase 1000MCM Cable	2018	Andy Franke
Kansas City Power & Light	Verdis Green 816-830-5372	Shawnee Medical Building - Feeder Project	<b>Install</b> (3,861') Three Phase 1000MCM Cable, (21) T-Body Terminations, (24) EPR to EPR Splice, (18) EPR to Lead Splice (Trifurcating Splice), (9) OH Riser Terminations, (1) Padmount Switchgear, (2) Three Phase Enclosure <b>Remove</b> (2,380') Three Phase 1000MCM Cable, (5) Three Phase Enclosures	2018	Andy Franke

**13.2kV 200 Amp Underground Construction**

Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Kansas City Power & Light	Tom Cree 816-245-4076	Nieman Rd - Shawnee Mission Pkwy to 55th St - OH to UG Conversion	<b>Install</b> (3) Three Phase Padmount TX, (1) Single Phase 200A Enclosure, (1) Three Phase 200A Enclosure, (5) Secondary Pedestals, (3,600LF) Three Phase 1/0 Cable, (1,924LF) Single Phase 1/0 Cable	2019	Matt Arne
Kansas City Power & Light	Tom Cree 816-245-4076	Hawksbury 5th Plat Subdivision - UG Cable Project - NW Skyview Ave & NW 108th St, KCMO	<b>Install</b> (965') Three Phase Primary Cable, (6,436') Single Phase Primary Cable, (2,249') Secondary Cable, (3) Three Phase Enclosures, (15) Single Phase Transformers, (20) Secondary Pedestals	2019	Andy Franke
Kansas City Power & Light	Jon Mooneyham 816-585-3268	Lake Winnebago - Circuit Addition & Upgrades	<b>Install</b> (1,175LF) Three Phase 1/0 AL Cable (1,205') Single Phase 1/0 AL Cable	2018	Andy Twyman
Kansas City Power & Light	Tom Cree 816-245-4076	159th St - Metcalf to Nall - Road Widening Project	<b>Install</b> (504') Three Phase Primary Cable, (1,490') Single Phase Primary Cable, (1,515') Secondary Cable, (2) Three Phase Enclosures, (5) Single Phase Enclosures, (6) Secondary Pedestals	2016	Bryan Davis
Kansas City Power & Light	Tom Cree 816-245-4076	Raintree Subdivision - UG Replacement Project - 163rd St & Ward Rd, LSMO	<b>Install</b> (8,289') Three Phase Primary Cable, (1,913') Single Phase Primary Cable, (21) Three Phase Enclosures, (3) Single Phase Enclosures <b>Remove</b> (20) Three Phase Enclosures, Cutting Off Old Direct Buried Cable Below Grade	2016	Bryan Davis
Kansas City Power & Light	Dave Black 816-214-2688	Underground Residential Distribution Maintenance Contract	<b>2015</b> (133,650') Install Cable (Three Phase-Single Phase-Secondary), (19) Install Single Phase Enclosure, (7) Replace Three Phase Enclosure, (11) Install Three Phase Enclosure, (31) Replace Single Phase TX, (62) Install Single Phase TX, (2) Install Three Phase TX, (23) Install Secondary Pedestal, (64) Riser Conduits, (71) Riser Cutouts, (71) Riser Arrestors <b>2016</b> (170,420') Install Cable (Three Phase-Single Phase-Secondary), (5) Replace Single Phase Enclosure, (54) Install Single Phase Enclosure, (6) Replace Three Phase Enclosure, (33) Install Three Phase Enclosure, (60) Replace Single Phase TX, (20) Install Single Phase TX, (8) Install Three Phase TX, (40) Install Secondary Pedestal, (135) Riser Conduits, (154) Riser Cutouts, (154) Riser Arrestors <b>2017</b> (140,400') Install Cable (Three Phase-Single Phase-Secondary), (9) Replace Single Phase Enclosure, (42) Install Single Phase Enclosure, (3) Replace Three Phase Enclosure, (34) Install Three Phase Enclosure, (30) Replace Single Phase TX, (13) Install Single Phase TX, (2) Install Three Phase TX, (20) Install Secondary Pedestal, (71) Riser Conduits, (77) Riser Cutouts, (77) Riser Arrestors <b>2018</b> (91,470') Install Cable (Three Phase-Single Phase-Secondary), (2) Replace Single Phase Enclosure, (37) Install Single Phase Enclosure, (2) Replace Three Phase Enclosure, (25) Install Three Phase Enclosure, (16) Replace Single Phase TX, (19) Install Single Phase TX, (3) Install Three Phase TX, (21) Install Secondary Pedestal, (50) Riser Conduits, (71) Riser Cutouts, (71) Riser Arrestors	2008-Present	Bryan Davis Andy Franke Andy Twyman Matt Arne

13.2kV Overhead Distribution Construction					
Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Kansas City Power & Light	Tom Cree 816-245-4076	Nieman Rd - Shawnee Mission Pkwy to 55th St - OH to UG Conversion	<b>Install</b> (25) Wood Poles, (3) Steel Poles, (2) Single Phase OH TX, (5) Three Phase OH TX Banks, (3) Single Phase Padmount TX, Misc. OH Secondary & Service Wire Work. <b>Remove</b> (75) Wood Poles, (12) Single Phase OH TX, (7) Three Phase OH TX Banks, (2) OH Cap Banks, (26,907) Single Phase & Three Phase OH Primary Wire	2019	Matt Arne
Westar Energy	Troy Rebel	Church St - Road Move Project	<b>Replace</b> (22) Wood Poles, (550) Three Phase 1/0 ACSR Primary Conductor From Horizontal To Vertical Construction, (750) Single Phase #2 ACSR Primary Vertical Construction, (1,500) Three #2 ATP Secondary Conductor, (8) Single Phase TX.	2019	Corey Williams
Kansas City Power & Light	Jon Mooneyham 816-585-3268	Lake Winnebago - Circuit Addition & Upgrades	<b>Install</b> (7) Wood Poles, (3) 546A Voltage Regulators & Platform <b>Replace</b> (50) Wood Poles, (93) Crossarms, (18) Underslung Disconnect Switches, (8,000) 3/0 ACSR Shield Neutral, (49,000) 477 AAC Three Phase Double Circuit Primary Conductor <b>Remove</b> (16) Wood Poles, (600) Three Phase #2 ACSR Primary Conductor, (2,700) Three Phase 477 ACSR	2018	Jason Richardson
Kansas City Power & Light	Jon Mooneyham 816-585-3268	KDOT 169 Hwy Road Project - Garnett to Welda, KS	<b>Install</b> (1) Steel Pole, (105) Wood Poles, (90) Crossarms, (38,254) #2 ACSR, (31,891) 3/0 ACSR, (6) Spans of Secondary Conductor <b>Remove</b> (105) Wood Poles, (90) Crossarms, (70,145) #4 ACSR, (16) Spans of Open Wire Secondary Conductor	2018	Jason Richardson
Kansas City Power & Light	Alex Berkovich 816-245-3916	AG Spanos - 115th & Lamar - OH to UG Conversion	<b>Install</b> (2) Wood Poles <b>Remove</b> (2) Steel Poles, (6) Wood Poles, (7,116) 477 ACSR Conductor, (1186) 3/0 ACSR Conductor	2018	Andy Franke
Kansas City Power & Light	Verdis Green 816-830-5372	Shawnee Medical Building - Feeder Project	<b>Install</b> (2) Wood Poles With 600A Switches <b>Remove</b> (3) Wood Poles, (1) Three Phase 900A Sectionalizing Switch, (2) Three Phase 600A Switch, (1) Single Phase TX, (2,980) 477 ACSR Conductor	2018	Andy Franke

600 Volt and Below Construction					
Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Independence Power & Light	Mitch Krysa 816-423-0360	Substation I (69kV/13.2kV) - Upgrade Existing Substation	<b>Install</b> New Control Cable & Control Room Panels/Equipment	2018	Dominic Soto
Kansas City Board of Public Utilities	Darrin McNew 913-645-1620	Muncie Substation (161kV/13.2kV) - Construct New Substation	<b>Install</b> New Control Cable & Control Room Panels/Equipment	2018	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations J (69kV/13.2kV) - Upgrade Existing Substation	<b>Install</b> New Control Cable & Control Room Panels/Equipment	2016	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations F (69kV/13.2kV) - Demo Existing Substation & Construct New Substation	<b>Install</b> New Control Cable & Control Room Panels/Equipment	2014	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations E (69kV/13.2kV) - Upgrade Existing Substation	<b>Replace</b> Relay Panels & Control Cable in Control Building	2014	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations C (69kV/13.2kV) - Capacitor Bank Addition	<b>Install</b> New Control Cable & Control Room Panels/Equipment	2013	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations K (69kV/13.2kV) - Capacitor Bank Addition	<b>Install</b> New Control Cable & Control Room Panels/Equipment	2013	Dominic Soto
Kansas City Board of Public Utilities	Lanny Uden 913-573-9524	Fiberglass Substations (161kV/13.2kV) - Above Grade Construction of New Substation	<b>Install</b> Control Cables For Temp. Power	2013	Dominic Soto

Conduit, Trench, and Underground Structures					
Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Kansas City Power & Light	Tom Cree 816-245-4076	Nieman Rd - Shawnee Mission Pkwy to 55th St - OH to UG Conversion	<b>Install</b> (8) 10x10' Precast Manholes, (1,260LF) Trench 4-Way Concrete Encased Duct Bank 6" Conduit	2019	Matt Arne
Kansas City Power & Light	Tom Cree 816-245-4076	Navy Substation Duct Bank Extension to Oak St	<b>Install</b> (4) 12x12' Cast-In-Place Manholes, (1) 16x10' Cast-In-Place Manhole, (900') Trench 12-Way Concrete Encased Duct Bank 6" Conduit <b>Remove</b> (1) 12x12' Concrete Manhole	2019	Andy Franke
Kansas City Power & Light	Tom Cree 816-245-4076	Lake Winnebago - Feeder Extension	<b>Install</b> (4) 10x10' Precast Manholes, (1,500) Trench 4-Way Concrete Encased Duct Bank 6" Conduit	2018	Matt Arne
Kansas City Power & Light	Alex Berkovich 816-245-3916	AG Spanos - 115th & Lamar - OH to UG Conversion	<b>Install</b> (4) 10x10' Precast Manholes, (1,200) Trench 4-Way Concrete Encased Duct Bank 6" Conduit, (250) Trench 2-Way Concrete Encased Duct Bank 6" Conduit, (150) Single 6" Conduit	2018	Andy Franke
Kansas City Power & Light	Verdis Green 816-830-5372	Shawnee Medical Building - Feeder Project	<b>Install</b> (1) 12x12' Precast Manhole, (1) 10x10' Precast Manholes, (1) Add Flare To Existing 12x12' Manhole, (310') Trench 8-Way Concrete Encased Duct Bank 6" Conduit, (513') Trench 6-Way Concrete Encased Duct Bank 6" Conduit, (212') Trench 2-Way Concrete Encased Duct Bank 6" Conduit (210') Trench Single 6" Conduit	2018	Andy Franke

Conduit, Directional Drill/Bore, and Underground Structures					
Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Kansas City Power & Light	Tom Cree 816-245-4076	Nieman Rd - Shawnee Mission Pkwy to 55th St - OH to UG Conversion	<b>Install</b> (5,400) Bore/Trench 6" Conduit, (3,564) Bore/Trench 4" Conduit, (902) Bore/Trench 3" Conduit, (1,924) Bore/Trench 2" Conduit	2019	Matt Arne
Kansas City Power & Light	Dave Black 816-214-2688	Underground Residential Distribution Maintenance Contract	<b>2015</b> (140,275) Bore/Trench Conduit (6" - 4" - 3" - 2") (16,953) Rock Boring/Trenching <b>2016</b> (183,943) Bore/Trench Conduit (6" - 4" - 3" - 2") (16,547) Rock Boring/Trenching <b>2017</b> (155,092) Bore/Trench Conduit (6" - 4" - 3" - 2") (10,078) Rock Boring/Trenching <b>2018</b> (94,966) Bore/Trench Conduit (6" - 4" - 3" - 2") (12,641) Rock Boring/Trenching	2008-Present	Andy Franke Andy Twyman Matt Arne
Kansas City Power & Light	Jon Mooneyham 816-585-3268	Lake Winnebago - Circuit Addition & Upgrades	<b>Install</b> (510) Bore/Trench 4" Conduit, (1,205) Bore/Trench 2" Conduit	2018	Andy Twyman
Kansas City Power & Light	Tom Cree 816-245-4076	159th St - Metcalf to Nall - Road Widening Project	<b>Install</b> (525) Bore/Trench 6" Conduit, (504) Bore/Trench 4" Conduit, (1,515) Bore/Trench 3" Conduit, (1,490) Bore/Trench 2" Conduit, (1) Switchgear Base, (3) Single Phase TX Bases	2016	Bryan Davis
Kansas City Power & Light	Tom Cree 816-245-4076	Raintree Subdivision - UG Replacement Project - 163rd St & Ward Rd, LSMO	<b>Install</b> (7,710) Bore/Trench 4" Conduit, (1,913) Bore/Trench 2" Conduit	2016	Bryan Davis

Fiber Optic Installation					
Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
KDOT	Shari Hillard 785-296-6356	I-70 Rest Stop Statewide ITS	<u>Install</u> ITS Signs, Cameras, Cabinets, Conduit System, Pull Boxes, and Fiber Optic Cable System.	2019	Don Bundy
MoDOT	Chad Baldwin 816-347-4143	Route 50 @ Hwy 291 DDI	<u>Install</u> Traffic Signals, Highway & Street Lighting, ITS Components (Including Conduit and Fiber Optic Cable)	2018	Don Bundy
KDOT	Kevin Kellerman 913-721-2754	I-35 / I-435 / K10 - Gateway Interchange	<u>Install</u> Traffic Signals, Highway & Street Lighting, ITS Components (Including Conduit, Fiber, DMS Signs, IP Cameras), and CenturyLink Conduit System	2017	Don Bundy
Northwest Electric COOP	John Kaiser 816-262-4838	Pittsville to Odessa Transmission Line Maintenance & OPGW Replacement (15 Miles)	<u>Install</u> 48ct OPGF & Splicing, 80 New X-Braces on Existing 69kV Structures, Removal of Old 3/8" Static Wire	2016	Mike Lies

Substation Construction					
Customer	Contact Information	Project Name	Scope of Work	Completion Date	General Foreman
Independence Power & Light	Mitch Krysa 816-423-0360	Substation I (69kV/13.2kV) - Upgrade Existing Substation	<u>Install</u> PTs, Concrete Foundations, Feeder Cable Conduits <u>Replace</u> Switchgear Building, Power Transformers, Disconnect Switches, Aluminum Bus, Wire Bus, Bus Duct, Concrete Foundations, Control Cable Conduits, Ground Grid and Install New	2018	Dominic Soto
Kansas City Board of Public Utilities	Darrin McNew 913-645-1620	Muncie Substation (161kV/13.2kV) - Construct New Substation	<u>Install</u> Grading, Concrete Foundations, Water Line, Sewer Line, Storm Sewer, Retaining Wall, Cable Trench, Control Cable Conduit, Feeder Cable Duct Banks, Ground Grid, Steel Structures, Equipment, Aluminum Bus, Wire Jumpers, Control Building, Switchgear Buildings, Power Transformers, 1000MCM Cable, Perimeter Fence, Lighting, Concrete Driveways, Concrete Curbs, Rock Surfacing	2018	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations L & A (69kV/13.2kV) - Upgrade Existing Substation	<u>Replace</u> PTs, Aluminum Bus, Wire Jumpers, Circuit Breaker and Install New Concrete Foundations, Control Cable Conduits, Feeder Cable Conduits, Ground Grid, Cable Trench, Switchgear Building, Fabric Oil Containment Pit	2017	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations J (69kV/13.2kV) - Upgrade Existing Substation	<u>Install</u> Concrete Foundations, Control Cable Conduits, Feeder Cable Conduits, Ground Grid, Cable Bus, Rock Surfacing <u>Replace</u> Disconnect Switches, PTs, Surge Arrestors, Power Transformer, Switchgear Buildings, Aluminum Bus, Wire Jumpers,	2016	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations F (69kV/13.2kV) - Demo Existing Substation & Construct New Substation	<u>Install</u> Grading, Concrete Foundations, Storm Sewer, Control Cable Conduits, Feeder Cable Conduits, Ground Grid, Cable Trench, Steel Structures, Equipment, Wire Jumpers, Aluminum Bus, Power Transformer, Bus Duct, Control/Switchgear Building, Substation Fence, Rock Surfacing, Testing/Commissioning	2014	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations C (69kV/13.2kV) - Capacitor Bank Addition	<u>Install</u> Concrete Foundations, Control Cable Conduits, Ground Grid, Disconnect Switch, Circuit Breaker, Cap Banks, Aluminum Bus, Wire Jumpers, Rock Surfacing, Testing/Commissioning <u>Replace</u> PTs	2013	Dominic Soto
Independence Power & Light	Mark Rothmier 816-325-7446	Substations K (69kV/13.2kV) - Capacitor Bank Addition	<u>Install</u> Concrete Foundations, Control Cable Conduits, Ground Grid, Disconnect Switch, Circuit Breaker, Cap Banks, Aluminum Bus, Wire Jumpers, Rock Surfacing, Testing/Commissioning <u>Replace</u> PTs	2013	Dominic Soto
Kansas City Board of Public Utilities	Lanny Uden 913-573-9524	Fiberglass Substations (161kV/13.2kV) - Above Grade Constuction of New Substation	<u>Install</u> Steel Structures, Equipment, Aluminum Bus, Wire Jumpers, Grounding, Conduits	2013	Dominic Soto



October 30, 2019

Black & McDonald  
Attn: Anthony Renfro  
6001 E. Front St.  
Kansas City, MO 64120

Re: Workers Compensation  
2019 Experience Modification Factor

Dear Anthony:

In accordance with your request, we are pleased to outline your experience modification factor:

EFFECTIVE DATE	MODIFICATION FACTOR
11/01/19	.50

If you should have any questions, please feel free to call our office.

Thank you.

LOCKTON COMPANIES, LLC

*Katrina Appelquist*

Katrina Appelquist  
Account Manager



LOCKTON COMPANIES  
444 W 47th Street, Suite 900 / Kansas City, MO 64112-1906  
816.960.9000 / FAX: 816.783.9000  
[www.lockton.com](http://www.lockton.com)

# Eric S. Vogel Jr.

Mobile: 816-215-3283 / Email: esvogel@blackandmcdonald.com

## Education

BS, Civil Engineering  
University of Kansas

## Training

ET&D OSHA 30 hour

NUITF – Distribution  
System Fundamentals

EUCI – Introduction To  
Substation Design

IMSA – Work Zone  
Temporary Traffic  
Control Technician

Rigging Training

Adult First  
Aid/CPR/AED Certified

Mr. Vogel Jr has worked in the electrical industry for 16 years in both the field operations and management. In management, he has represented Black & McDonald as a project manager, department manager, and division manager. His proven ability to not only estimate/manage/deliver projects but also develop/mentor/manage operational teams makes him exceptionally qualified as division manager.

## Management History

- **Black & McDonald – Division Manager – KC Operations – (June 2020 – Present)**
  - Serving as division manager over our KC Operations managing a team of department managers, assisting with the developing/mentoring/managing multiple teams of project managers responsible for the successful delivery of all outside and inside electrical operations run out of our KC Office.
- **Black & McDonald – Department Manager – KC Utility Operations – (June 2017 – June 2020)**
  - Served as a department manager over our KC Utility Operations developing/mentoring/managing a team of project managers responsible for the successful delivery of all distribution, transmission, and substation projects for electric utilities, private developers, and municipalities.
- **Black & McDonald – Project Manager – KC Utility Operations – (June 2011 – June 2017)**
  - Served as a project manager in our KC Utility Operations successfully estimating/managing/delivering distribution, transmission, and substation projects for electric utilities, private developers, and municipalities.
- **Black & McDonald – Material Runner / Laborer – KC Operations – (June 2004 – June 2011)**
  - Served in the field as a material runner / laborer in our KC Operations during Christmas and summer breaks while studying Civil Engineering in school.



# Michael Bishop

## Superintendent

### Affiliations

IBEW Local 53

Mr. Bishop serves Black & McDonald as Superintendent. He is responsible for distribution, street lighting and traffic signal construction and maintenance projects for state, municipalities and electric utilities. He has successfully completed numerous state and municipality projects over his 30 year career.

### Selected Project History

- **City of Kansas City, MO Street Lights (2000-Present)**

As Superintendent, Mr. Bishop has coordinated the entire field repair and maintenance services for the City of Kansas City, MO street light system for over 11 years. He has been instrumental in developing and delivering all of the field work processes that meet and exceed the stringent performance criteria of the City contract. He has directed the street light program for all routine maintenance, special maintenance, bridge and decorative lighting maintenance and large design/build construction projects.

Mr. Bishop's working knowledge of the City street light system is unsurpassed and has contributed to the development of innovative and cost effective solutions for the City including:

- Development of underground construction procedures to deter cable theft
- Work methods to safely and effectively repair lights on bridges
- Solutions for repairing special Foyer and decorative lighting
- Repair of Downtown underground network of street light circuits

- **Capital Electric (1995-2000)**

As General Foreman had responsibility for construction of overhead and underground electric distribution as well as street light and traffic signal system installations. Also, has extensive experience in storm restoration efforts.

- **Kansas Power & Light (1979-1995)**

As General Foreman had responsibility for construction, maintenance, and operation of the overhead and underground electric and underground gas distribution systems. Also has experience with electric transmission system and substation switching operations.

# Nick Ziegler

## Manager of Utility Services

### Education

BS, Mechanical  
Engineering  
University of Missouri –  
Kansas City

### Training

ET&D OSHA 10 hour

ET&D OSHA 30 hour

NUITF – Distribution  
System Fundamentals

NECA – Project  
Management for Line  
Contractors

CPR / AED / First Aid

Mr. Ziegler serves Black & McDonald as a Manager in the Utility Services Division. This division is responsible for all transmission, distribution and substation projects with electric utilities, private developers, and municipalities. Mr. Ziegler's construction background and experience qualify him to successfully manage projects from bidding to completion make him exceptionally qualified to deliver various T&D projects on time and on budget. He has successfully completed and assisted in completion of electric utility and municipal projects during his career. Mr. Ziegler's engineering design background also gives him a unique knowledge of conception to delivery of final plans to the customer.

### Selected Project History

- **Black & McDonald (2006 –Present):** Mr. Ziegler serves as a Manager of Utility Services responsible for the successful development and delivery of all transmission, distribution and substation projects performed.
- Distribution Circuit Upgrades – City of Kirkwood, MO
- Various locations of distribution lateral rebuilds, KS/MO – KCPL
- Pittsville-Odessa 69kV Fiber Installation, Lafayette Co, MO – NW Electric COOP
- W 247<sup>th</sup> St OH Rebuild, Wellsville, KS – KCPL
- Douglas County OH Relocation Project, Baldwin City, KS – KCPL
- Jefferson St OH & UG Improvements, Lee's Summit, MO – KCPL
- City of Ulrich Lagoon & Pump Field OH Projects - KCPL
- Sabetha Industrial Feeder Circuit Construction – City of Sabetha, KS
- BNSF Argentine Yard Fast Tracks – Electric Relocation – Subcontractor to Clarkson Construction for BNSF
- Bank of American 161kV Transmission Line Addition – KCPL
- Troost Substation 161kV Transmission Line Addition – KCPL
- Harrisonville Hwy 291 Electric Relocation – City of Harrisonville, MO
- URD Cable Fault Repairs Annual Contract - KCPL
- URD Cable Replacement Annual Contract – KCPL
- Joint Use Make Ready Annual Contract – KCPL
- Meter Based Surge Protection Annual Contract – KCPL
- Platte City 25kV OH to UG Conversion – KCPL
- Kansas City, MO N Bennington Ave OH to UG Conversion - KCPL
- Blue Springs South Duct Bank Project – KCPL
- Ward Parkway (GSA & USDA) Duct Bank Projects – KCPL
- Cerner Data Center Duct Bank Project - KCPL
- Pad Mount Transformer Replacement & Maintenance Project – KCPL
- 69kV Shrank Rd Rebuild – IPL
- Storm Response – Westar, KCPL, & other utilities as required
- OH Distribution Maintenance Annual Contract – KCPL
- OH Distribution Maintenance Annual Contract – Phillips 66 Refinery
- First Solar Silver State North 230kV Substation & Transmission Line – Burns & McDonnell
- Joint Use Pole Load Analysis & Survey Services - Westar

AFFIDAVIT OF COMPLIANCE  
WITH IMMIGRATION LAW

STATE OF MISSOURI )  
 )  
COUNTY OF JACKSON )

THE UNDERSIGNED NICK ZIEGLER, of lawful age and being  
first duly sworn, states upon oath that (s)he is the

MANAGER OF UTILITY SERVICES  
Title  
of BLACK + McDONALD, the Contractor  
Name of Company

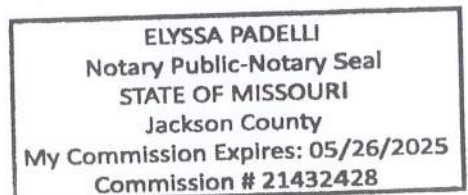
submitting the attached bid/proposal and that the Contractor is enrolled and  
participates in a federal work authorization program with respect to the  
employees who will perform work under the contract and that the Contractor  
does not knowingly employ to perform work under this contract any person who  
is an unauthorized alien.

Nick Ziegler  
Signature

Subscribed and sworn to before me, a Notary Public, in and for the County and  
State aforesaid, this 20 day of JANUARY, 2022.

Elyssa Padelli  
Notary Public

My Commission Expires: 05-26-2025



AFFIDAVIT OF COMPLETION OF OSHA CONSTRUCTION SAFETY PROGRAM

STATE OF MISSOURI )  
 ) ss.  
COUNTY OF JACKSON )

I, NICK ZIEGLER, do hereby authenticate that I am a duly authorized agent of BLACK + McDONALD and I have all requisite power and authority to execute and deliver this Affidavit and am competent to testify to the matters stated herein on behalf of BLACK + McDONALD.

BLACK + McDONALD has provided a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Missouri Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program for employees that have not previously completed the required program and, and will require all employees who have not previously completed the required program to complete the program within sixty days (60) of beginning work on any construction project for the City of Independence, Missouri.

Any employee found on a work site subject to this section without documentation of the successful completion of the course required under Missouri Revised Statute 292.675 shall be afforded twenty days to produce such documentation before being subject to removal from the project.

The contractor shall forfeit as a penalty to the City of Independence two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training. The City of Independence shall withhold and retain therefrom all sums and amounts due and owing as a result of any violation of this section when making payments to the contractor under the contract.

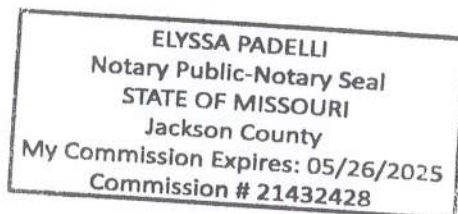
By: Nick Ziegler  
NICK ZIEGLER  
Printed Name  
BLACK + McDONALD  
Company

Subscribed and sworn to before me this 20 day of JANUARY, 20 22.

Elyssa Padelli  
Notary Public

My Commission Expires:

05-26-2025





**DIVISION OF  
LABOR  
STANDARDS**

MISSOURI DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
**AFFIDAVIT  
COMPLIANCE WITH THE PREVAILING WAGE LAW**

I, NICK ZIEGLER, upon being duly sworn upon my oath state that: (1) I am the MANAGER OF UTILITY SERVICES of BLACK + McDONALD; (2) all requirements of §§ 290.210 to 290.340, RSMo, pertaining to the payment of wages to workers employed on public works projects have been fully satisfied with regard to this company's work on ITB 2110 - SUB A CAPACITOR BANK; (3) I have reviewed and am familiar with the prevailing wage rules in 8 CSR 30-3.010 to 8 CSR 30-3.060; (4) based upon my knowledge of these rules, including the occupational titles set out in 8 CSR 30-3.060, I have completed full and accurate records clearly indicating (a) the names, occupations, and crafts of every worker employed by this company in connection with this project together with an accurate record of the number of hours worked by each worker and the actual wages paid for each class or type of work performed, (b) the payroll deductions that have been made for each worker, and (c) the amounts paid to provide fringe benefits, if any, for each worker; (5) the amounts paid to provide fringe benefits, if any, were irrevocably made to a fund, plan, or program on behalf of the workers; (6) these payroll records are kept and have been provided for inspection to the authorized representative of the contracting public body and will be available, as often as may be necessary, to such body and the Missouri Department of Labor and Industrial Relations; (7) such records shall not be destroyed or removed from the state for one year following the completion of this company's work on this project; and (8) there has been no exception to the full and complete compliance with the provisions and requirements of Annual Wage Order No. \_\_\_\_\_ Section \_\_\_\_\_ issued by the Missouri Division of Labor Standards and applicable to this project located in JACKSON County, Missouri, and completed on the 20 day of JANUARY, 2022.

The matters stated herein are true to the best of my information, knowledge, and belief. I acknowledge that the falsification of any information set out above may subject me to criminal prosecution pursuant to §§290.340, 570.090, 575.040, 575.050, or 575.060, RSMo.

[Signature]  
Signature

Subscribed and sworn to me this 20 day of JANUARY, 2022.

My commission expires 05-26-2025.

[Signature]  
Notary Public

ELYSSA PADELLI  
Notary Public-Notary Seal  
STATE OF MISSOURI  
Jackson County  
My Commission Expires: 05/26/2025  
Commission # 21432428

\_\_\_\_\_  
Receipt by Authorized Public Representative

*Missouri Department of Labor and Industrial Relations is an equal opportunity employer/program.*

AFFIDAVIT

STATE OF MISSOURI )  
 )  
COUNTY OF JACKSON )

SS.

NICK ZIEGLER of the City of ODESSA  
\_\_\_\_\_, County of LAFAYETTE, State of MISSOURI,

being duly sworn on her or his oath, deposes and says:

1. That I am the MANAGER OF UTILITY SERVICES (Title of Affiant) of BLACK + McDONALD (Name of Bidder) and have been authorized by said bidder to make this affidavit on the bidder's behalf;
2. No Councilmember, City Manager, Director of Finance and Administration, City Procurement Manager, or any City employee is financially interested in what the bidder is offering to sell to the City pursuant to this invitation, nor is the bidder a City employee or board member whose bid creates a conflict of interest. A conflict of interest would arise if any person named in this section is in a position to affect either the decision to solicit bids or the selection of the successful bidder;
3. Bidder has not participated in collusion or committed any act in restraint of trade, directly or indirectly, which bears upon anyone's response or lack of response to this Invitation; and
4. Bidder is responsible for submitting with his or her bid a record of any discussion with a Councilmember, City Manager, Director of Finance and Administration, City Procurement Manager, or any other City employee regarding this invitation; and
5. The authorized signer of this document certifies that the organization and each of its principals are not suspended or debarred by the City of Independence, State of Missouri or Federal government.

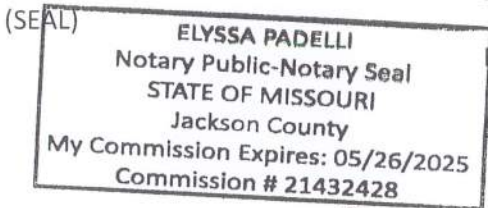
BLACK + McDONALD (Name of Bidder)

By: Nick Ziegler NICK ZIEGLER (Signature of Affiant)

MANAGER OF UTILITY SERVICES (Title of Affiant)

Subscribed and sworn to before me this 20 day of JANUARY, 2022.

Elyssa Padelli



NOTARY PUBLIC in and for the County of Jackson  
State of Missouri

My commission expires: 05-26-2025



January 10, 2022

Re: Custom Lighting Services, LLC dba Black & McDonald  
ITB #21110 - Substation A Capacitor Bank

To Whom It May Concern:

It is our pleasure to provide this reference letter to you on behalf of our client, Custom Lighting Services, LLC dba Black & McDonald, and will confirm their bondability.

Travelers Casualty and Surety Company of America provides bonds for Custom Lighting Services, LLC dba Black & McDonald. Travelers is rated "A++" by the A.M. Best Company, and is listed in the Department of the Treasury's Listing of Approved Sureties (Department Circular 570), with Treasury Limits of \$209,103,000.

Travelers is willing to provide bonding support on behalf of Custom Lighting Services, LLC dba Black & McDonald, with an aggregate program of up to \$250,000,000. At the request of our client, we would look favorably on supporting performance and payment bonds. However, our support is conditioned upon completion of the underwriting process, including satisfactory review of contract documents, confirmation of financing and our ongoing review of the operational and financial capacity of Custom Lighting Services, LLC dba Black & McDonald.

This letter is not an assumption of liability and is issued only as a prequalification reference request from our client. It should be understood that any arrangement for bonds is strictly a matter between Custom Lighting Services, LLC dba Black & McDonald and Travelers.

We highly recommend Custom Lighting Services, LLC dba Black & McDonald to you. They are well managed, financed, and truly capable of meeting your requirements. If you have any questions, please do not hesitate to contact me.

Sincerely,

TRAVELERS CASUALTY AND SURETY COMPANY OF AMERICA

Veronica Lawver  
Attorney-in-Fact





**Travelers Casualty and Surety Company of America**  
**Travelers Casualty and Surety Company**  
**St. Paul Fire and Marine Insurance Company**

**POWER OF ATTORNEY**

**KNOW ALL MEN BY THESE PRESENTS:** That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Veronica Lawver** of **KANSAS CITY**, Missouri, their true and lawful Attorney(s)-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

**IN WITNESS WHEREOF**, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this 21st day of April, 2021.



State of Connecticut

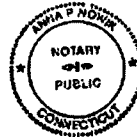
City of Hartford ss.

By:   
 Robert L. Raney, Senior Vice President

On this the 21st day of April, 2021, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of each of the Companies, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of said Companies by himself as a duly authorized officer.

**IN WITNESS WHEREOF**, I hereunto set my hand and official seal.

My Commission expires the 30th day of June, 2026



Anna P. Nowik, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of each of the Companies, which resolutions are now in full force and effect, reading as follows:

**RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

**FURTHER RESOLVED**, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

**FURTHER RESOLVED**, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

**FURTHER RESOLVED**, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of each of the Companies, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 10th day of January, 2022



Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.  
 Please refer to the above-named Attorney(s)-in-Fact and the details of the bond to which this Power of Attorney is attached.



## **Attachment C - EEC - Substation A Cap Bank Proposal**



Procurement Division  
111 E Maple, PO Box 1019  
Independence, MO 64051-0519

Invitation to Bid #22014  
Substation A Capacitor Bank Construction project  
Response Deadline Date and Time: 3/8/22, 2:00 p.m., Local Time

Bid opening: Microsoft Teams Meeting url:

[https://teams.microsoft.com/l/meetup-join/19%3ameeting\\_Yjc1OGZhZWYtYzgyMS00MzdKLFmZTAAtNGMzMDg0N2Vknzc0%40thread.v2/0?context=%7b%22Tid%22%3a%22862de864-c0f2-4801-a187-836f98f56db0%22%2c%22Oid%22%3a%2278cd3938-af7a-4a7a-b818-48acfc62eaf5%22%7d](https://teams.microsoft.com/l/meetup-join/19%3ameeting_Yjc1OGZhZWYtYzgyMS00MzdKLFmZTAAtNGMzMDg0N2Vknzc0%40thread.v2/0?context=%7b%22Tid%22%3a%22862de864-c0f2-4801-a187-836f98f56db0%22%2c%22Oid%22%3a%2278cd3938-af7a-4a7a-b818-48acfc62eaf5%22%7d)

or call in (audio only)

[+1 660-631-8082](tel:+16606318082), [561141190#](tel:+1561141190) United States, Marshall  
Phone Conference ID: 561 141 190#

A non-mandatory pre-bid conference will be held at **10:00 a.m., Friday, February 18, 2022** at the Service Center at 21500 E Truman Rd, Independence MO, 54056

Deadline for questions is 5:00 p.m. local time on 3/4/22

Please submit all questions regarding this Invitation to Bid online via [www.publicpurchase.com](http://www.publicpurchase.com)

**ATTENTION BIDDER – COMPLETE AND RETURN WITH BID**

Bidding Firm Emerald Electrical Consultants, LLC Phone Number 423-305-3254  
(Please print or type)

Address 2575 Jason Industrial Pkwy Ste C City Winston State GA Zip 30187

Name of Authorized Agent Ryan Truitt Email rtruitt@emerald-power.com

The only authorized source for bid forms, addenda, and information regarding this bid is [www.publicpurchase.com](http://www.publicpurchase.com). Using bid forms, addenda, and bid information not obtained from [www.publicpurchase.com](http://www.publicpurchase.com) creates the risk of not receiving necessary bid information that may eliminate your bid from consideration. Bids must be submitted online via [www.publicpurchase.com](http://www.publicpurchase.com). Paper, fax, or email bids will NOT be accepted and will not be returned to sender.

Submitting a bid response is bidder’s response to adhere to all specifications, scopes, terms, and conditions of this ITB.

**General Terms & Conditions and Response Instructions**  
**Construction**

**Response Instructions to Bidder**

**1. ACCEPTANCE**

Each bid is received with the understanding that the acceptance in writing by the City of the offer to furnish any or all commodities or services described therein shall constitute a contract between the bidder and the City, which shall bind the bidder on his or her part to furnish and deliver the commodities and services quoted at the prices stated in accordance with the conditions of said accepted bid. The City, on its part, may order from the contractor, except for cause beyond reasonable control, and to pay for, at the agreed prices, all commodities and services specified and delivered.

Upon receipt of an Invitation to Bid (ITB) package containing a City of Independence "sample contract" as part of the requirements, it is understood that the bidder has reviewed the documents with the understanding that the City requires all contracts between the parties be entered into via this document. If any exceptions are taken to any part, each must be stated in detail and submitted as part of the bid. If no exceptions are stated, it is assumed that the bidder fully agrees to the provisions contained in the "sample contract" in its entirety. No exceptions to the General Terms & Conditions of the ITB shall be accepted.

**2. DEFINITIONS**

- A. The term "City" means the City of Independence, Missouri.
- B. The term "contractor" means the person or organization that receives the award after the bid process.
- C. The term "Invitation to Bid" and acronym "ITB" means a solicitation for bids.
- D. The term "bidder" means the person or organization responding to an ITB with a bid.
- E. The term "bid" means the response submitted by the bidder in response to an ITB.

**3. ITB SOURCE**

Bidders may view and download bid documents from [www.publicpurchase.com](http://www.publicpurchase.com), via the City's website at [www.indepmo.org](http://www.indepmo.org). Bidders using ITB documents not obtained from [www.publicpurchase.com](http://www.publicpurchase.com) risk not receiving any necessary addenda, possibly eliminating their bids from consideration.

**4. QUESTIONS**

Questions regarding the bid process shall be submitted via [www.publicpurchase.com](http://www.publicpurchase.com). The City will respond to questions via [www.publicpurchase.com](http://www.publicpurchase.com), thus providing all questions and answers to all prospective bidders equally.

**5. PREPARATION OF BIDS**

- A. Bidders are responsible for conducting site visits (if applicable), attending pre-bid conferences (if applicable) and examining all drawings, specifications, schedules, etc., included in the ITB. Failure to do so will be at the bidder's risk.
- B. Each bidder shall furnish the information required in the ITB. The bidder shall complete all sections requiring information or a signature. An agent duly authorized to enter the firm into a legally binding, contractual agreement must sign the document. Electronic signature is acceptable.
- C. Unit price for each unit bid shall be shown and shall include packaging for shipment unless otherwise specified. A total shall be entered in the total column for each item bid. In case of discrepancy between a unit price and extended price, the unit price shall prevail.
- D. Freight, if applicable, shall be shown as a separate line item cost and not included in the cost of the goods.
- E. Prices quoted are to be firm and final.
- F. Bidders shall prepare their bids for City projects without including sales tax.
- G. Alternate bids for supplies or services other than those specified will not be considered unless authorized by the ITB.
- H. Bidder must state a definite date and time for delivery of supplies or services unless otherwise specified in the ITB.
- I. Number of days shall be calendar days, which includes Saturdays, Sundays, and holidays.
- J. If the item has a trade name, brand, or catalog number, such must be stated in the bid.
- K. Bidders shall submit online via [www.publicpurchase.com](http://www.publicpurchase.com) unless otherwise specified in the ITB.
- L. Bond requirements and liquidated damages, if applicable, will be set forth in the specifications.

**6. ADDENDUM**

The City reserves the right to officially modify or cancel an ITB after issuance. Modifications will be made only by written addendum. Bidders must acknowledge any addendum by opening and accepting on [www.publicpurchase.com](http://www.publicpurchase.com).

**7. BUY AMERICAN AND DOMESTIC PRODUCTS POLICY STATEMENT**

It is the policy of the City of Independence, Missouri, to buy materials, products, supplies, provisions, and other articles produced, manufactured, compounded, made or grown within the State of Missouri, when they are found in marketable quantities in the state, and are of a quality suited to the purpose intended and can be secured without additional cost over products of other states; provided however, that quality and fitness of articles shall be considered in purchasing or letting contracts for articles herein mentioned.

It is the policy of the City of Independence to buy goods or commodities that have been manufactured, assembled, or produced in the United States of America, unless:

- A. The purchase, lease, or contract involves an expenditure of less than \$5,000.
- B. Only one line of a particular good or product is manufactured, assembled, or produced in the United States.

- C. The specified products are not manufactured, assembled, or produced in the United States in sufficient quantities to meet the City's requirements or cannot be manufactured, assembled, or produced in the United States within the necessary time in sufficient quantities to meet the City's requirements; or
- D. Obtaining the specified products manufactured, assembled, or produced in the United States would increase the purchase price by more than 10%
- E. To qualify for the preference, bidder shall clearly state in its bid whether the materials quoted were manufactured, assembled, or produced in the United States of America. If multiple items are listed in the ITB, the bidder shall clearly state which items were manufactured, assembled, or produced in the United States of America.

**8. LOCAL PREFERENCE POLICY**

Licensed businesses operating from a physical address in the City of Independence for a minimum of six (6) months when quality, service and other terms of the purchases are equal to or better than the low bid. The local business shall be given a preference of ten percent (10%) over the low bid, provided that the difference between the low bid and the local bid does not exceed thirty thousand dollars (\$30,000.00) maximum.

**9. EQUAL EMPLOYMENT OPPORTUNITY**

During the performance of this contract or purchase order, the contractor agrees as follows:

- A. The contractor will not discriminate against any employee or applicant for employment because of race, age, color, religion, sex, national origin or any other legally protected category. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated fairly during employment, without regard to their race, age, color, religion, sex, or national origin. Such action shall include, but not be limited to: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- B. The contractor will state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, sex, or national origin in all solicitations or advertisements for employees placed by or on behalf of the contractor.
- C. The contractor will send a notice advising the said labor union or workers' representatives of the organization's commitment under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment to each labor union or representative of workers with which he or she has a collective bargaining agreement or other contract or understanding.
- D. The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- E. The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his or her books, records, and accounts by the Department and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- F. In the event of the contractor's noncompliance with the non-discrimination clauses of this contract or purchase order with any of the said rules, regulations, or orders, this contract or purchase order may be canceled, terminated, or suspended in whole or in part, and the contractor may be declared ineligible for any further government contracts, purchase orders, or federally assisted contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, or by rules, regulations, or order of the Secretary of Labor, or as otherwise provided by law.
- G. The contractor will include the entire text of this Equal Employment Opportunity section and its subsections in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the department may direct as a means of enforcing such provisions, including sanctions of noncompliance; provided, however, that in the event a contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the department, the contractor may request the United States to enter into such litigation to protect the interest of the United States.

**10. ANTI-DISCRIMINATION AGAINST ISRAEL ACT**

Contractors working on behalf of the City of Independence are to abide by Missouri Revised Statute 34.600, otherwise known as the Anti-Discrimination against Israel Act.

**11. CONFLICT OF INTEREST AND DEBARMENT**

By submission of its response, the contractor certifies that:

- A. No Councilmember, nor the City Manager, the Director of Finance or the City Procurement Manager is financially interested in what the bidder is offering to sell to the City pursuant to this invitation, nor is the bidder a City employee or board member whose bid creates a conflict of interest. A conflict of interest would arise if a City employee or board member were in a position to affect either the decision to solicit bids or the selection of the successful bidder.
- B. Bidder has not participated in collusion or committed any act in restraint of trade, directly or indirectly, which bears upon anyone's response or lack of response to this Invitation.
- C. The authorized signer of the bid document certifies that the contractor and each of its principals are not suspended or debarred by the City of Independence, State of Missouri or Federal government.
- D. All bidders shall complete, have notarized, and submit the attached non-conflict of interest and non-collusion form. Failure to submit the completed form shall be grounds for rejection of bid.

**12. SUBMISSION OF BIDS**

- A. Bids and any modifications (addendum) shall be submitted electronically through [www.publicpurchase.com](http://www.publicpurchase.com).

- B. Telephonic, emailed, paper, or faxed bids will not be considered, unless authorized in the ITB.
- C. Samples of items, when required, must be submitted within the time specified and unless otherwise specified by the City, at no expense to the City. If not consumed by testing, samples will be returned at bidders request and expense, unless otherwise specified in the ITB.
- D. Bids will be opened at the date and time indicated on the ITB cover page. An unofficial bid tabulation, with no indication of award or final numbers, will be made available upon request. Bidders must allow ample time for the City to create the tabulation (a minimum of five business days).
- E. A final bid tabulation and Notice of Intent to Award for bids over \$50,000 will be posted on the City's website and [www.publicpurchase.com](http://www.publicpurchase.com) at least five days prior to City Council approval.

**13. MODIFICATION OR WITHDRAWAL OF BIDS**

Modification or withdrawal of bids will be via [www.publicpurchase.com](http://www.publicpurchase.com). Click on "Edit" response and delete the desired item(s) previously entered. Delete any uploaded documents, and click "Save". This will remove the initial response. Follow the same procedure to withdraw a bid before the bid deadline and simply cancel the submittal.

**14. LATE BIDS**

It is the responsibility of the bidder to submit the bid on or before the date and time of the ITB submission deadline. Bids will NOT be accepted after the date and time of closing under any circumstances.

**15. QUALIFICATIONS OF BIDDERS**

The City shall exercise due diligence in determining the responsibility of bidders. The bidder shall furnish all information, within the time frame specified, if requested by the City. The City reserves the right to reject any bid if the information is not submitted in a timely manner or the information, or subsequent investigation, fails to satisfy the City that such bidder is properly qualified to carry out the obligations of the contract and to complete the work as specified in the ITB.

The City may consider the following factors in determining a bidder's responsibility:

- A. The ability, capacity, and skill of the bidder to perform the contract or provide the required materials, equipment, or supplies;
- B. Whether the bidder can perform the contract or provide the materials, equipment, or supplies promptly or within the time specified without delay or interference;
- C. The quality of performance in previous contracts;
- D. The previous and current compliance by the bidder with laws and ordinances related to the contract or service;
- E. The sufficiency of the bidder's financial resources to perform the contract or provide the commodities;
- F. The ability of the bidder to provide future maintenance and service.

**16. AWARD**

Award shall be made to the lowest priced most responsive and responsible bidder who submits the bid most advantageous to the City. Additional considerations will be given to prior contract history with the City, references, warranty information, delivery schedule, and other requirements as specified in the ITB. The City reserves the right to accept or reject any or all bids or portions of bids, make multiple awards, to waive irregularities and technicalities, and to request re-bids on the materials or services described in the bid documents. The City reserves the right to award the contract on such materials or services as the City deems will best serve its interests. The City reserves the right to award the contract on a partial-order basis, lump-sum or individual-item basis, or such combination as shall best serve the interest of the City unless otherwise specified. Conditional bids, including bids in are subject to rejection in whole or in part at the sole discretion of the City. Bids that take exception to the City's General Terms and Conditions will be rejected.

**17. RIGHT OF PROTEST**

The Procurement Manager, or appointed designee, will accept written protests regarding the solicitation of any goods, services or commodities with a dollar value of \$50,000 or less within five (5) business days of a bid opening. For purchases over \$50,000, a Notice of Intent to Award will be posted on the Internet at [www.publicpurchase.com](http://www.publicpurchase.com). Any bid protest must be filed within five (5) business days of the date of posting of the Notice. Neither the City nor Public Purchase shall be responsible for directly notifying bidders of the Notice of Intent to Award.

Protests must be received in the office of the Procurement Manager and must contain the following information:

- A. Company name, address, phone number and signature of the authorized representative;
- B. Solicitation number;
- C. Detailed statement describing the grounds for the protest; and
- D. Supporting evidence or documents to substantiate the claim.

The Director of Finance and Administration will review the information provided and issue a written decision within five (5) business days of receipt of the protest. This decision shall be final.

**GENERAL TERMS & CONDITIONS FOR CONSTRUCTION**

**18. CONTRACTOR'S RESPONSIBILITY**

- A. The contractor explicitly understands and agrees that the City is in no way responsible for the cost to the contractor of the work, nor for the cost of the risks involved in executing the work, and that the payments herein provided include compensation for all risks as well as for all completed construction. It is expressly understood that the contractor is in all respects an independent contractor for this work and is in no

respect an agent, servant or employee of the City. The contractor specifically represents that in performing work covered by this agreement he or she is the sole employer of all labor to be furnished in the performance of this work and that, within the meaning of all federal and state unemployment compensation, insurance or other laws and all State Worker's Compensation Acts, the contractor's employees and the employees of all subcontractors are not employees of the City for any purpose whatsoever; also that the contractor accepts exclusive liability for all contributions, taxes, interest and penalties necessarily paid by the City under unemployment compensation, insurance or other laws on account of all persons employed by the contractor or any subcontractors hereunder, and the contractor hereby agrees to reimburse the City for all contributions, taxes, interest, penalties, if any, necessarily paid by the City under unemployment compensation, insurance or other laws covering employees of the contractor or any subcontractors.

- B. The contractor agrees to pay in full for all furnished materials and for all employed labor for the work or any part thereof, and to save the City free and harmless from any lien for work or labor performed, or materials or supplies furnished in the performance of the work under this contract, and from every claim, demand, or lien arising from or growing out of any act or thing done or suffered by the contractor or any agent, servants or subcontractors, and any employees in, about or connected with the construction of the work aforesaid. The contractor agrees to pay and discharge all bills and claims against the contractor in any way incurred in connection with the work herein provided for; it being intended hereby to cover the payment of all items, whatsoever their nature, in addition to items which entitle the claimant to a lien upon any property of said City by virtue of the laws of the State of Missouri.
- C. The contractor shall require any subcontractors deemed a transient employer as defined by State law to show proof of having filed a financial assurance instrument with the State Director of Revenue and to show proof that the subcontractor holds a current valid certificate of insurance for workers' compensation coverage in Missouri prior to the subcontractor performing any work under the contract. If required by the State Director of Revenue or the State Director of the Division of Worker's Compensation, the contractor will withhold all or any part of payment to the subcontractor to satisfy State law.
- D. The contractor agrees to comply in all respects with the requirements of law relating to furnishing reports and statements, or as may be reasonably required by the City.
- E. It shall be the responsibility of the contractor to examine the site of the work to determine the amount of work to be done in connection with the construction herein specified, the quantities of material required, and the construction equipment and labor necessary for the performance of the contract. By submission of a bid for this work, the contractor represents that he or she has investigated the character of the work and conditions which may be encountered, and the quantities and types of related work not covered by unit prices, and agrees that the data furnished herein is merely informative and represents the best information available at the time of advertising for bids. The contractor understands that such information or data is furnished to the bidder without guarantee of its accuracy and variations from the indicated amounts or types of work, other than that covered by contract unit prices, required to complete the contract will not entitle the City to any credits or the contractor to any extra payment.

#### **19. APPLICABLE CODES AND STANDARDS**

- A. Reference to standard specifications of any technical society, organization or association, or to codes of local or state authorities, shall mean the latest such standard, code, specification or tentative specification adopted and published at the date of taking of bids, unless specifically otherwise stated. Applicable codes and standards referred to in these specifications shall establish minimum requirements for equipment, materials and construction and shall be superseded by more stringent requirements of drawings and specifications when and where they occur.
- B. All construction methods and tools shall meet all State of Missouri safety requirements and comply with commonly accepted standards for safety and health of personnel engaged in construction work.

#### **20. COMPLIANCE WITH LAWS, PERMITS, LICENSES AND TAXES**

- A. The contractor shall conform to and comply with all applicable laws, bylaws, regulations and ordinances with regard to all and every action and operation, and shall require conformity and compliance of all subcontractors and employees in such a manner as to save the City harmless. The contractor shall secure and be financially responsible for all permits, licenses, approvals, acceptances, etc., relative to the conduct of all work and shall give all notices necessary to the due and lawful prosecution of the work. Fees for required City permits for work within the construction limits will not be waived.
- B. The City is exempt from sales tax. This includes purchases by contractors for City projects. The City will provide a certificate to contractors for their use in obtaining the sales tax exemption. Contractors are to prepare their bids for City projects without including sales tax. It is the responsibility of the contractor to request a tax exempt certificate and a project tax exemption certificate before the project begins. Missouri state law prohibits issuance of project exemption certificates after the project is completed.

#### **21. FORCE MAJEURE**

Neither party shall be liable for delays, or defaults in the performance of a contract due to Acts of God or the public enemy, riots, strikes, fires, explosions, accidents, governmental action of any kind or any other causes of a similar character beyond its control and without its fault or negligence. Neither party shall penalize or add any additional fees, surcharges, or any other financial requirements due to force majeure.

#### **22. PATENTS**

The bidder warrants that the articles described herein and the sale or use of them will not infringe upon any U.S. or foreign patent or copyright and bidder covenants they will at their own expense, defend every suit that may be brought against the City, or those selling or using City's product (provided winning bidder is promptly notified of such suit and all documentation delivered) for any alleged infringement of any patent or copyright by reason of the sale or use of such articles; and contractor agrees they will pay all costs, damages, and profits recoverable in any such suit. All fees or royalties for any patented article or operation of work or any part thereof, or any materials, tools, implements, machinery, fixtures, or anything used shall be included in the price stipulated in the bid, and the contractor shall protect and hold harmless the City against all demands for such fees, royalties, and claims.

### **23. SUPERVISION AND INSPECTION**

- A. The work herein considered is to be constructed in accordance with the contract documents. Wherever the words "directed, permitted, approved, acceptable, satisfactory," or words or phrases of similar import occur in the contract documents, they shall be understood to be functions of the City and to be exercised at the City's discretion.
- B. Methods of construction and procedure shall be of the contractor's own selection, provided no requirement of the contract documents is violated and the work is completed within the time allowed. Approval of the City of any construction device or method, or absence of disapproval, shall not relieve the Contractor of full responsibility for any failure thereof and shall not connote and is not intended to connote that the City will direct the manner in which the work is to be performed under the contract.
- C. All materials and every process of manufacture and construction shall be subject to inspection at all times and the City or any representative shall have free access to all operations. The Contractor shall provide necessary facilities for inspecting workmanship and testing of materials, and the City shall have the right to select suitable samples of materials for testing and examination, which the contractor shall supply without charge. In case such samples must be shipped to some other point for inspection or testing, the contractor shall box or crate samples as necessary and shall deliver them at points designated for shipment, without charge. Omission of inspection shall not relieve the contractor of any obligation to produce the work required by plans and specifications.
- D. Rejected materials shall be removed promptly from the vicinity of the work and the contractor shall promptly remove, reconstruct, replace and make good as may be directed, without charge, any defective work. If in the judgment of the City, the defective work would perform within an allowable tolerance, the contractor may be given the choice of receiving reduced payment for the work or removing and replacing the defective work. Oversight or error of judgment of inspectors, or previous acceptance, shall not relieve the Contractor from the obligation to make good defects whenever discovered. If the contractor does not make corrections of such condemned work and remove rejected materials within a reasonable time, as fixed by written notice, the City may make removals and corrections and charge the expense to the contractor.
- E. The contractor shall furnish to the City any information concerning the nature or source of any material or equipment or part thereof which the contractor proposes to use. Tests may be conducted where, in the opinion of the City, such are necessary. Where the contractor desires to propose for use in the work any material or product as an alternative or equivalent to a material or product specified herein, the contractor will be required to submit samples to a testing bureau designated by the City, and shall pay the cost of such testing and analysis as may be required to determine the suitability of such materials and products.

### **24. PERSONAL LIABILITIES**

In carrying out any of the provisions of a contract or in exercising any power or authority granted to them thereby, there shall be no personal liability upon any member, agent or representative of the City. No act or failure to act on the part of the City or any agent of the City, payment for the work in whole or in part, extension of time or possession taken of the work, shall operate as a waiver of any right to damages therein provided for; nor shall waiver or breach of contract be held to be a waiver of any other or subsequent breach.

### **25. SUBLETTING OR ASSIGNING CONTRACT**

- A. The contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of the contractor's right, title or interest therein, without written consent of the City. Request for permission to sublet, assign or otherwise dispose of any portion of the contract shall be in writing and shall be accompanied by evidence that the organization which will perform the work is particularly experienced and equipped for such work.
  - (1) In case such consent is given, the contractor will be permitted to sublet a portion thereof, but the contractor shall perform work amounting to not less than 50% of the total contract cost, except that any items designated by the City as specialty items so performed by subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the contractor.

The value of the work sublet will be determined by multiplying the number of units of any contract item sublet by the unit price as set forth in the original contract, or by a price agreed to by the City where no unit price is included in the contract for the work sublet. Approval of the subcontract is in no way approval of the unit prices in the subcontract. The subcontractor shall perform the work described in the subcontract agreement. The contractor shall furnish the City a signed copy of the subcontract on request.

- B. No subcontracts or transfer of contract shall in any case release the contractor of his or her liability under the contract and bonds.

### **26. COOPERATION WITH OTHERS**

The contractor and subcontractors will be expected to cooperate with forces of the City, utility companies or other contractors who may be working in the area. No delay of this contract work due to avoidable conflicts will be allowed. The contractor shall, as far as possible, arrange work schedules and dispose of materials so as not to interfere with the operations of other contractors or others engaged upon the project or nearby. The contractor shall also join his or her work to that of others in a proper manner, in accordance with the spirit and intent of the contract documents and perform his or her work in proper sequence in relation to that of other contracts.

### **27. PLANS (CONTRACT DRAWINGS)**

- A. Certain plans prepared on behalf of the City, and elsewhere described and named to accompany and supplement these provisions, constitute a part of the contract documents. Such plans are agreed to be constructively attached to the contract documents, although convenience may preclude physical attachment.
- B. The City shall have the right to modify details of these plans to provide final, or checked, plans in lieu of any preliminary or unchecked plans, as the work proceeds, all of which shall be considered as plans accompanying the contract documents. The contractor shall not take

advantage of any errors or discrepancies discovered in the plans, but shall report same, and the City will make or approve the necessary corrections.

- C. The contractor will be provided, at no cost, a maximum of ten sets of contract documents. Additional sets of these documents will be supplied at the cost of printing, materials and delivery.

## **28. NOTICE TO PROCEED**

- A. Upon receipt of contract documents fully executed by the City, the contractor shall immediately proceed with activities pertaining to the work, such as specified coordination submittals and required conferences. The contractor shall not move onto the site until the City has issued a written Notice to Proceed.
- B. The Notice to Proceed will be issued upon completion of (a) receipt of acceptable copies of insurance policies and certificates, (b) acceptance of specified coordination submittals, i.e., Program of Construction, Schedule of Values, etc., and (c) the conclusion of initial coordination conferences. The date of Notice to Proceed shall be that on which the contractor may move onto the site, unless otherwise set forth in the said notice, which date will not be more than thirty days after the date of contract, unless City and contractor agree upon a longer time. The completion time of contract shall be the number of calendar days stated in the contract beginning with the date of Notice to Proceed or date stated therein.

## **29. GENERAL PROVISIONS CONCERNING TIME**

- A. The construction herein provided for is to be completed within certain times as set forth in the contract documents. No payment shall be made to the contractor on account of any delays whatsoever, no matter by what or by whom caused, even by other contractors on the same work, or by reason of the City's acts in giving directions, in rejecting materials, methods or workmanship, or by seasons, weather or stream fluctuations. The amount provided in the contract for payment for the work items is understood and agreed to include and cover all expenses due to delays. Extensions of time for completion will be granted under the following conditions:
  - (1) If the City should, in writing, direct deferment of the beginning of work beyond the official date to begin work, or if the City should order the work closed down or temporarily discontinued, corresponding extensions of time would be granted with due consideration for changed working conditions incident to seasons and weather.
  - (2) If the final contract price, as increased by duly executed change order(s), exceeds the total contract price based on the estimated quantities as given in the bid, the time of completion will be set forward a number of working days in the proportion that such excess cost bears to the cost based on estimated quantities.
  - (3) The contractor is requested to bring to the attention of the City, in writing and during the progress of the work, the occurrence of events that the contractor may warrant extension of time under the conditions of the contract. If the contract is not completed within the time stipulated, the contractor shall, at the conclusion of the work, present a written statement to the City concerning all matters of time extensions.
  - (4) The amount of all extensions of time, for whatever reason drafted, shall be determined by the City with due consideration of working seasons and working conditions. In general, only actual and not constructive or hypothetical days of delay will be considered. The City shall have authority to draft additional extensions of time as the City may deem advisable and justifiable.
  - (5) If the contractor fails to complete the work within the time fixed by the contract or extensions thereof, and if the City shall nevertheless permit the contractor to continue and complete the same, such permission shall neither modify nor waive any liability of the contractor for damages arising from non-compliance of the work within the said time, but all liabilities shall continue in full force against the contractor.
- B. With only the exceptions outlined herein, all work under any contract shall be completed and ready for operation within the time listed in the bid after the issuance of Notice to Proceed.

## **30. LIQUIDATED DAMAGES**

- A. If the contractor shall neglect, refuse, or fail to complete the work within the time set forth above, or any proper extension thereof granted by the City, the contractor shall pay to the City the amount specified in the bid documents for each day the entire work is incomplete. Said obligation of the contractor is not a penalty but is liquidated damages for loss to the City and the public, after the expiration of the time stipulated in the contract, as adjusted by duly executed change orders, and will be deducted from any money due the contractor under the contract. The contractor and the surety of record shall be liable for any and all liquidated damages.

## **31. PREVAILING WAGE**

If a contract is issued from this ITB that is valued at \$75,000 or above, the contract shall be based upon payment by the contractor or contractor's subcontractors of wage rates not less than prevailing hourly wage rate for each craft or classification of workers engaged to perform the work as determined by the Industrial Commission of Missouri on behalf of the Department of Labor and industrial Relations. The prevailing wage law does not prohibit payment of more than the prevailing rate of wages nor does it limit the hours of work, which may be performed by any worker in any particular period of time. The contractor shall submit certified payrolls to the City's project manager. Prevailing wage requirements include:

- A. State of Missouri prevailing wage rates per current wage order for Jackson County, Missouri that is named in the specifications section of this solicitation. Prevailing wages must be paid by the successful contractor in accordance with labor involved for this project (Section 290.250, RSMo).
- B. The contractor will forfeit a penalty to the City of \$100 per day (or portion of a day) for each worker that is paid less than the prevailing wage rate for any work done under the contract the by contractor or by any subcontractor (Section 290.250, RSMo).
- C. The contractor and all subcontractors to the contract must require all onsite employees to complete the ten-hour construction safety training program required under Section 292.675, RSMo, unless they have previously completed the program and have documentation of having done so.



- D. The contract will forfeit a penalty to the contracting public body of \$2,500 plus an additional \$100 for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training (Section 292.675, RSMo).
- E. The City's Procurement Division will file a Prevailing Wage Project Notification form (PW-2) to the Division of Labor Standards upon issuance of the contract and retain copy in City files.
- F. While the contract work is being performed, a legible list of all prevailing wage rates must remain posted in a prominent and easily accessible place at the worksite by each contractor and subcontractor on the project (Section 290.265, RSMo).
- G. Before final payment can be made, the general contractor and all subcontractors must file an Affidavit of Compliance form PW-4 with the City of Independence. The affidavit must state the contractor has fully complied with Missouri Prevailing Wage Law, and the City must verify that the correct wages were paid. No payment can be legally made by the City to the contractor(s) until the affidavit is filed in proper form and order with the City.
- H. The City's Project Manager shall retain a copy of certified payroll in City files.

**32. BOND AND MAINTENANCE GUARANTEE**

The contractor shall provide, as stipulated in this ITB, a payment, performance, and maintenance bond for faithful performance of the contract and for persons performing labor or furnishing materials in connection therewith, with sureties satisfactory to the City and in the form provided. This bond shall be in the full amount of the contract and shall have as surety thereon a company authorized to do business in the State of Missouri, qualified as acceptable surety for United States government deposits, and acceptable to the City.

The contractor will guarantee that the equipment, materials and workmanship furnished under the contract will be as specified and will be free from defect for a period of two years from the date of final City acceptance. In addition, the equipment or materials furnished by the contractor shall, upon receipt of notice from the City, be repaired or replaced without expense to the City, and the contractor shall save the City harmless from any damage from faulty workmanship or materials installed under the contract.

**33. TAKING OVER WORK AND WITHHOLDING PAYMENTS**

- A. If the contractor shall become insolvent or be declared bankrupt, or commit any act of bankruptcy or insolvency, or if it should become evident to the City that the contractor is not making proper progress to ensure completion within the specified time, or is prosecuting the work with insufficient, inadequate, or unsuitable plant and equipment, or has failed to make good rejected work or materials, the City shall have the right, without violation of contract, after giving the contractor seven days' notice in writing, to undertake itself either by administration or by letting contract(s) to other parties, the completion of the said work which is being thus neglected, or to supplement the contractor's work and operations by supplying additional plant, equipment, materials or labor.
- B. Should the City's work cost less than the contractor would have been paid, the difference shall be paid to the contractor. However, should it cost more, the difference shall be payable by the contractor and the contractor shall, on demand, pay the amount of excess to the City. Under these circumstances and for these purposes, the City shall have the right to enter upon and take temporary possession of the plant, tools, and supplies of said contractor, or any part thereof.

In addition to the percentage of payments to be temporarily retained by the City, pending completion of the work, the City shall have the right to withhold sufficient amounts of any payment otherwise due the contractor to cover failure of the contractor to make proper payment on amounts past due and payable for just claims for labor, materials and services applied to the work of the contract, and for defective work not remedied. The City shall have the right to act as agent for the contractor in disbursing such withheld funds to the party or parties entitled thereto, and in case of such disbursements shall render the Contractor a full accounting for all such funds.

- C. The City shall not be obligated to take any such action and the failure of the City to act under this and similar clauses of the specifications shall not relieve the contractor from any responsibilities, obligations, or liabilities resulting from failure to complete the contract within the times prescribed.

**34. USE OF COMPLETED WORK**

The City may, prior to the completion of all the work performed by the contractor or acceptance thereof by the City, enter upon and use any portion of said work without any compensation or payment whatever to the contractor for any delay in the work caused by such use. Such taking possession and use shall not be deemed as acceptance of the work so taken and used, or any part thereof.

**35. SAFETY PRACTICES AND ACCIDENT PREVENTION**

- A. In the performance of the contract, the contractor and subcontractors shall comply with and observe all of the requirements of the Federal Occupational Safety and Health Act (OSHA), and all rules and regulations published in connection therewith. The contractor shall provide equipment and medical facilities as are necessary to supply first aid to anyone who may be injured in connection with the project. Provisions must also be made for the immediate removal and hospitalization in case of emergency. Anyone acting in a supervisory capacity should have authority to order such emergency action.
- B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes and the like shall be observed. Machinery and equipment and other hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are consistent with applicable law or regulation.
- C. The contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient red or yellow lights, danger signals, warning and closure signs, and shall provide watchers and take all necessary precautions for the protection of the work and the safety of the public.

### 36. LIABILITIES, DAMAGES, AND ACCIDENTS

- A. The contractor shall assume and be responsible for and shall indemnify, protect and save harmless the City against any and all claims, demands or causes of action by any party or parties whatsoever for loss, injury or damage of any kind or character, either to persons or to property, directly or indirectly arising out of his/her operations or the acts or omissions of the contractor, any agents or workers. The contractor shall pay all judgments obtained by reason of accidents, injuries or damages in any suit or suits against the City, including all legal costs, court expenses and other like expenses; the contractor shall have the option of assuming the sole defense of such suits.
- B. The contractor shall assume all risks of loss and damage to the contractor's property and to property in his/her custody and to the property of any employees, agents, and servants, howsoever caused; all risks of damage resulting from the death of or injury to himself/herself, any agents and servants, while engaged in said work and while traveling to and from the same; and he/she agrees to hold the City free and harmless from all loss, cost and expense on account thereof, and agrees to indemnify and save harmless the City from all loss, cost and expense arising or growing out of any injury to any employee of the City caused by the negligence of the contractor or any employees; also from all loss, cost and expense arising or growing out of any injury to any person while upon the premises of the City caused by the negligence of the contractor, or any employee; also from all loss, cost and expense arising or growing out of any damage to any property, whether belonging to the City or not.
- C. All delivered materials and portions of completed work shall be deemed to have become the property of the City, but the contractor shall store materials and shall be responsible for and shall maintain partly or wholly finished work during the continuance of the contract, and until final acceptance of the work covered by the contract. If any materials or parts of the work be lost, damaged or destroyed by any means whatsoever, the contractor shall satisfactorily repair and replace the same at his or her own cost.

### 37. INSURANCE REQUIREMENTS

#### Construction

- A. Contractor shall procure, and maintain as required, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the Scope of Services/Project. The cost of such insurance shall be included in the Contractor's bid.
- B. Contractor shall maintain the following coverages and minimum limits:
  - 1. Commercial General Liability: [ISO "occurrence" form or its equivalent]
    - a. \$2,000,000 General Aggregate
    - b. \$1,000,000 per occurrence limit Bodily injury/Property damage
    - c. \$1,000,000 Personal/Advertising injury
    - d. \$1,000,000 Products & Completed operations aggregate limit.
  - 2. Business Auto Coverage: (Applicable to any *Owned, hired, and non-owned autos*) \$1,000,000 property damage / bodily injury, combined single per Accident limit – Any Auto. If no autos are owned by the proposing Contractor, a non-owned auto liability endorsement on the Commercial General Liability program is acceptable.
  - 3. Workers Compensation and Employers Liability: Workers compensation limits as required by the statutes of the state of Missouri and employers' liability limits of \$100,000/\$500,000/\$100,000. When workers compensation insurance policy is applicable "other states" coverage is required. Regardless of any minimum number of employees to trigger statutory responsibility, the City requires evidence of Workers' Compensation insurance should the Contractor have any employees.
  - 4. Umbrella Liability: minimum limit of \$1,000,000 excess of Commercial General Liability.

Exposure Limits: The above are minimum acceptable coverage limits and do not infer or place a limit on the liability of the Contractor nor has the City assessed the risk that may be applicable to Contractor. Contractor shall assess its own risks and if it deems appropriate and/or prudent maintain higher limits and/or broader coverages. The Contractor's insurance shall be primary and any insurance or self-insurance maintained by the City shall be excess for the City and not contribute with the coverage maintained by Contractor.

Coverage Limits: Coverage limits for General and Auto Liability exposures may be met by a combination of primary and umbrella policy limits.

- C. Additional Insured. The City shall be listed by ISO endorsement or its equivalent as additional insureds for the service/project as the City's interest may appear on the General Liability and any applicable Umbrella Liability. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- D. Verification of Coverage.
  - 1. A certificate of insurance accompanied by an additional insured ISO form endorsement (CG 20 10; and CG 20 37) or equivalent effecting the coverage required by the City which includes products and completed operations.
  - 2. The insurance coverages are to be provided by Missouri admitted insurance companies with a Best's rating of at least A:-VII. Those not admitted must be approved by City.
  - 3. Any self-insurance or self-insured retentions must be specified on the certificate of insurance if \$50,000 or higher per claim/loss. In addition, when self-insured the name, address, and telephone number of the claims office must be indicated on the certificate or separate attached document. Any and all deductibles or self-insurance in the above describes coverages shall be the responsibility and at the sole risk of the Contractor.
  - 4. When any of the foregoing insurance coverages are required to remain in force after final payment, additional certificates with appropriate endorsements evidencing continuation of such coverage shall be submitted along with the application for final payment.
  - 5. Any coverage provided by a Claims-Made form policy must contain a three-year tail option, extended reporting period, or must be

maintained for three years post contract.

6. Any deviation from the requirements set forth in this Insurance section may be allowed by the City Risk Manager subject to the City Legal Department's review and approval.
- E. Cancellation. Each insurance policy required shall not be suspended, voided, or canceled; except after thirty (30) days' advance written notice has been given to the City.
- F. Subcontractors. The Contractor may include all subcontractors as additional insured under its insurance policies or shall furnish to the City separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.
- G. Indemnity
  1. Loss: For purposes of indemnification requirements, the term "Loss" means any and all loss, damage, liability or expense, of any nature whatsoever, whether incurred as a judgment, settlement, penalty, fine or otherwise (including reasonable attorney's fees and the cost of defense), in connection with any action, proceeding, demand or claim for injury, including death, to any person or persons or damages to or loss of, or loss of the use of, property of any person, firm or corporation, including the parties hereto, which arise out of or are connected with the performance of this Agreement.
  2. Indemnification and Hold Harmless: For purposes of this Agreement, Consultant agrees to indemnify, defend and hold harmless City and its agents from any and all Loss where Loss is caused or incurred as a result of the intentional misconduct, recklessness, negligence, or other actionable fault of Consultant or its subcontractors.
  3. Comparative Fault & Contributory Negligence: It is a specific element of consideration of this Agreement that the indemnity in Section V.E.2 will apply notwithstanding the joint, concurring or contributory or comparative fault or negligence of City or any Third Party and, further notwithstanding any theory of law including, but not limited to, a characterization of City's or any Third Party's joint, concurring or contributory or comparative fault or negligence as either passive or active in nature; provided, however, that Consultant's obligation hereunder will not include amounts attributable to the fault or negligence of City or any Third Party for whom Consultant is not responsible.
  4. Damage Limitations: The indemnification obligation contained in this Agreement will not be limited by any limitation on amount or type of damages, compensation or benefits payable by or for Consultant or its subcontractors, by the minimum insurance required by this Agreement, nor under workers' compensation acts, disability benefit acts, or other employee benefit acts.
  5. Negligence by the City: Consultant is not required hereunder to defend City or its agents from assertions that they were negligent, nor to indemnify and hold them harmless from liability based on City's negligence.

Comply: \_\_\_\_\_ Exception: \_\_\_\_\_

#### **ACKNOWLEDGEMENT OF INSURANCE REQUIREMENTS**

By signing its proposal, respondent acknowledges that is has read and understand the insurance requirements for the proposal. Respondent also understand that the certificate of required insurance must be submitted within fifteen (15) days following the notification of award. No final contract will be signed by the City until all Certificate of Insurance are received and meet the minimums noted herein.

The contractor shall not commence work under this contract until he or she has obtained all insurance required under this section and elsewhere in the contract documents, such as exceptional insurance requirements outlined in the contract special provisions, and such insurance has been approved by the City.

#### **38. CHANGES IN AMOUNTS OF WORK**

The City shall have the right to increase or diminish the quantity, to change the order, or to dispense with portions of the work at any time without impairing the contract and without changing the unit prices to be paid.

In case of increase in amount of work, payment for such increase at the unit price bid for the work or the classes so increased shall be full compensation for the work done. When changes to work occur that are not covered in the contract documents and involving added cost, they will be performed only on a written change order signed by the contractor and duly processed by the City. All costs and indirect costs, including overhead, bond, and profit shall be submitted as a maximum cost figure on this change order. The Contractor shall not proceed with any work under a change order requiring additional materials or costs until written approval is given by the City.

The City may at or prior to contract award appropriate up to ten percent more than the contract value to be reserved for change orders to the project. Administrative change orders may be processed for the contract up to appropriation amounts. Administrative change orders may be for unit price extensions, cost plus additions, or negotiated prices and are to be in written form approved by the City. Change orders that exceed 10% of the total contact price require approval by the City Council, unless otherwise specified in the ITB.

#### **39. NEW ITEMS**

- A. The City shall have the right to require the contractor to perform work or supply materials essential to the completion of the work, of a class or type not provided for in the contract documents, or not included and covered under classifications for which price payments are provided in the contract. This work shall be added as a new line item.
- B. When a new item is ordered, it shall be paid for as the City may elect, either by a lump sum or by unit prices mutually agreed upon by the City and the contractor in writing, or, if such agreement cannot be made or the City so elects, on the basis of estimated cost to the

contractor of constituent unfabricated materials, including fuel, or applied labor, and of liability insurance for labor, plus 20% thereof to cover and include contractor's profit, superintendence, overhead, and indirect expense, including interest on borrowed money and premiums on bonds, and for the use of plant, equipment, tools, and appliances. Where manufactured or fabricated materials or articles are to be purchased for installation or some of the work is done by subcontract the contractor shall estimate 5% over and above the contractor's costs of such items instead of 20%. For such work, plant and tools shall be provided of the same general character as employed for similar kinds of operations on the project.

C. The contractor shall not begin any work for which new items are provided in the contract without written approval from the City.

#### **40. NOTICE OF CLAIMS FOR EXTRA COMPENSATION**

Should any conditions arise which in the contractor's opinion will require any claims or demands for extra or additional compensation above that fixed by the contract, or on which he or she contemplates bringing claims for such extra compensation, the contractor shall promptly and before incurring any expenses, notify the City in writing of the conditions and circumstances and that such claims are anticipated. The contractor agrees that any claims made without such advance notice, and not presented in such a way as to enable the City to observe conditions as they occur and to verify expenses as they occur and to determine with certainty the correctness of such claims and of the expenses involved, are waived and shall be null and void. The contractor shall not proceed with any work requiring added compensation until written approval is given by the City.

#### **41. ACCEPTANCE OF WORK**

No part of the construction will be finally accepted until the all construction is completed in its entirety. Upon final completion of the work, the City will make final inspection and when it is found that the contractor has completed the entire contract in accordance with the contract documents, the City will thereupon issue a written order of acceptance and the final pay estimate will be rendered.

#### **42. METHODS OF PAYMENT**

- A. Lump Sum Payment: When so indicated in the ITB, payment will be made for the entire contract upon completion, final inspection, approval of as-built record plans and acceptance of the work.
- B. Partial (Progress) Payments: Payments will be made at unit prices shown in the bid with work in place as described in the contract documents as a basis for making monthly pay estimates. Before the first application for payment, the contractor shall submit to the City a schedule of values of the various portions of the work, including quantities, if required by the City, aggregating the total contract sum, divided according to subcontractors and prepared in such form as the City and the contractor may agree upon, and supported by such data to substantiate its correctness as the City may require. Each item in the schedule of values shall include its proper share of overhead and profit and this schedule, when approved, shall be used only as a basis for the contractor's application for payment.

At least 15 calendar days before each payment will fall due, the contractor shall submit to the City an itemized application for payment, supported to the extent required by the City by receipts or vouchers showing payments for materials and labor, payments to subcontractors, and such other evidence of the right to payment as the City may direct. On or about the first day of the month, the City will make an estimate of the value of the total work done and shall pay to the contractor, within 15 days, 90% of the amount of such estimated sum, less the sum of all previous payments. No payments will be made on account of materials not to be incorporated in the work. Progress payments will be made to the contractor based on 90% of the value of the work satisfactorily completed and for the unused material on hand at the time of the progress estimate. After the contract is 50% completed, payments may be increased by the full value of the additional work satisfactorily completed. The retained percentage will be withheld by the City until final payment is authorized, except that when the work is stated as substantially complete in writing, the City may reduce the retained percentage to an amount equal to two hundred percent of the remaining minor items to be completed.

As directed in writing by the City, adjustments may be made in the estimates for quantities shown under each bid item at the unit prices named in the bid, so long as these adjustments do not result in an excess of the total contract amount.

It is agreed by the Contractor that any payments or advancements of funds to be made to the contractor under provisions of this agreement shall not be assigned or pledged by contractor unless consent in writing is first obtained from the City.

- C. Force Account may be applied under the following conditions:
  - (1) Force Account work will be measured and paid for on a contractor's cost plus a percentage basis.
  - (2) The contractor's cost is hereby defined and shall include the amounts required to pay subcontractors plus the costs of contractor's as follows:
    - a. Labor Costs
      - (i) The payroll cost for all workers such as foremen, mechanics, craftsmen, and laborers.
      - (ii) All incidental labor expenses incurred as a direct result of the performance of the work, including payroll taxes, worker's compensation, pension, and retirement allowances and social security insurance or other regular payroll charges on same.
    - b. Material and Equipment Costs
      - (i) The cost of all materials and equipment required, delivered to the construction site that are not furnished by City or others.
      - (ii) Sales and use taxes applicable to such materials and equipment.
    - c. Supplemental Costs
      - (i) Rental for all power-driven equipment at agreed-upon rates shall be charged against Force Account work only for the actual time which the equipment is used specifically therefore.
      - (ii) Transportation charges necessarily incurred in connection with such equipment, which is not already on the site.
      - (iii) Cost of power, fuel, lubricants, and water required for such equipment (may be included in agreed-upon rate).

- (iv) Additional cost for surety bonds, liability and property damage, and other insurance required, where cost is necessarily increased by coverage of the Force Account Work.
- d. The above definitions and requirements apply equally to work done by subcontractors, suppliers and manufacturers.
- e. The percentages, which shall be added to the several items of contractor's cost, are as follows:
  - (i) Amounts paid to subcontractors - 5%
  - (ii) Labor costs - 10%
  - (iii) Material and equipment costs - 10%
  - (iv) Supplemental costs - 0%
- (3) The above percentages shall be understood to include all other costs and full compensation for profit, overhead, superintendence, field office expense and all other elements of cost not included in the "contractor's cost," as herein defined.
- (4) The contractor shall keep and present in an acceptable form an accurate account with vouchers of the several items of cost, including those of subcontractors performing Force Account work.
- D. Late Payment Clause: If the City fails to make a monthly pay estimate thirty (30) days after approval, in addition to other remedies available to the contractor, then interest shall be added to each payment at the maximum legal rate, commencing on the first day after said payment is due and continuing until the payment is received by the contractor. The legal rate of interest shall be as specified in R.S.Mo 34.057.

**43. ACCEPTANCE AND FINAL PAYMENT**

Upon determination by the City that all work has been completed in accordance with the contract, and approval of as-built plans submitted for record, the City will accept the project as such by an approved Letter of Acceptance. When the work has been so completed and certified by the City, a final estimate will be executed and submitted which will provide payment to the contractor for the entire sum due as set forth in the contract documents, including all amounts previously retained by the City. All prior partial estimates and payments shall be subject to correction by the City in this final estimate and payment. Payments for the work will be made by the City's credit card, which is the preferred method of payment with no added fees; or check by the City of Independence, Missouri, as herein specified.

**44. MISSOURI SUNSHINE LAW**

The bidder acknowledges and agrees that the City is bound by the Missouri Open Records Law (Sunshine Law) and cannot protect information for the sole reason that it is marked "confidential" or "proprietary". All information submitted in response to this ITB shall be available for public review in accordance with all federal, state and local laws after: 1) posting of the Notice of Intent to Award; 2) a contract has been executed; or 3) all bids have been rejected. Requests must be submitted in writing to the Procurement Manager, City of Independence.

**45. FIRM PRICES**

The bidder warrants that prices quoted in their bid will be firm for acceptance for a period of not less than 120 days from the bid opening date unless otherwise specified in the bid document. Such prices will remain firm for the period of time specified in the purchase order or contract. The City shall not be responsible to pay surcharges or any other fees not disclosed in the bid and agreed upon between the parties.

**46. GENERAL GUARANTY AND WARRANTY**

The contractor warrants that all materials, fixtures, and equipment furnished by the contractor and his subcontractors shall be new, of good quality, and of good title, and that the work will be done in a neat and workmanlike manner. The contractor also guarantees the workmanship and materials for a minimum period of one year from the date of final acceptance of all the work required by the contract. Furthermore, the contractor shall furnish the City with all manufacturers' and suppliers' written guarantees and warranties covering materials and equipment furnished under the contract.

**47. TERMINATION**

City may terminate or suspend performance of a contract for City's convenience upon written notice to contractor. City shall pay contractor for all the services performed till the date of the termination by the City or suspension expenses.

A contract may be terminated by either party upon written notice in the event of substantial failure by the other party to perform in accordance with the terms of the contract. The nonperforming party shall have ten (10) calendar days from the date of the termination notice to cure or to submit a plan for cure acceptable to the other party. Risk to persons or property shall result in immediate termination of the contract.

**48. AVAILABILITY OF FUNDING**

Any resulting contract or purchase order is contingent upon the availability of funding and allocation of City funds. The City may cancel any contract or purchase order immediately by giving written notice to the contractor, in the case of a reduction or elimination of funds or funding for any project, commodity, or service.

**49. CHOICE OF LAW**

Any dispute related to a contract resulting from this ITB shall be governed by the laws of the State of Missouri. The City and the contractor agree that the performance of a contract will be deemed to have occurred in the State of Missouri and that contractor's performance under a contract will be deemed the transaction of business in Missouri. Jurisdiction and venue for any claim or cause of action arising under a contract shall be exclusively in the Sixteenth Judicial Circuit of Missouri and the contractor submits to personal jurisdiction of and waives any personal jurisdiction or inconvenient forum objection to that court.

**50. PRECEDENCE OF DOCUMENTS**

The ITB including the terms and conditions, the successful bidder's (contractor) response and written quote, and purchase order shall constitute the entire contract for each project. If these General Terms & Conditions be in conflict with any attached Special Conditions, the Special

Conditions will supersede the General Terms & Conditions. In case of a discrepancy, the purchase order shall take precedence over the ITB and the ITB shall take precedence over the contractor's response and written quote for each project.

## CONTRACT SPECIAL PROVISIONS (CONDITIONS)

### A. ANTICIPATED SCHEDULE

The outage window is anticipated to be September 1, 2022 – May 31, 2023. Bidder must provide an estimated schedule for construction in the outage window with bid.

### B. QUALIFICATIONS OF BIDDERS

1. Bidders shall submit information as follows:

- a. Bidder must complete the entire bid form and the bid summary sheet.
- b. Bidder shall supply a project schedule.
- c. Bidder shall provide an electronic copy of their Safety Program.
- d. Bidders shall submit with their proposal a minimum of five (5) references. Reference list shall include contacts and phone numbers where previous work scopes required similar services to be provided.
- e. Bidder shall have an Experience Modification Rating (EMR) of 1.0 or less and provide supporting documentation from their underwriter.
- f. Bidder shall provide qualifications of the firm, subcontractors, and list key personnel to be assigned to the project to demonstrate its capability to complete the project in accordance with the plans and specifications and the contract timeline.
- g. Bidder shall complete the Affidavit of Compliance with Immigration Law, Affidavit of Non Collusion, Affidavit of Completion of OSHA Construction Safety Program.
- i. The payment, performance and maintenance bond must be provided after award of the contract.
- h. Bidder shall submit in writing any exceptions to the scope of work/specifications, terms & conditions or contract. Exceptions must be submitted as a separate page that clearly describes each exception.

### C. LIQUIDATED DAMAGES

For each and every day that the work and services and any specified portions thereof are not completed after the time or times fixed for completion in the Contract Documents, the Contractor shall pay the City, not as a penalty, but as liquidated damages, \$500 (Five Hundred Dollars) for each and every day during which the completion of the work and services and any specified portions thereof are delayed.

Because of the difficulty in computing the actual damages which will result from failure to complete the work and services and any specified portions thereof on time, the said amount or amounts of liquidated damages are hereby estimated, agreed upon, and determined in advance by the parties hereto as a reasonable evaluation of the actual damages which the City will suffer for each and every day during which the completion of the work and services and any specified portions thereof are delayed beyond the time or times herein fixed.

Such monies due to the Contractor or to become due to the Contractor, at or after the time or times fixed in the Contract Documents for the work and services and any portion thereof, may be retained by the City, as may be necessary to pay said liquidated damages; the Contractor shall immediately pay the deficiency to the City. Such deductions or amounts retained by the City shall not in any degree release the Contractor from further obligation and liability with respect to fulfilling the entire Contract.

Nothing contained herein shall preclude claims by the City for damages caused by Contractor errors, omissions, or negligence unrelated to delay in completing the construction within the construction time or construction times fixed for completion in the Contract Documents.

### D. MISCELLANEOUS

1. The method of payment is Partial (Progress) Payments as described in Section 41 of the General Terms & Conditions and Response Instructions Construction. Additional clarifications are made in the detailed specifications.

2. Please list a contact person for questions regarding the bid response, if different than the listed authorized agent on the cover sheet.

**SUBSTATION A CONSTRUCTION**

Contractor to fill in all line-item columns for items left blank.  
 For line-item descriptions requesting a "price adjustment" only insert unit prices; do not include the "extended bid price".

Item No.	Description	Qty.	Unit	Unit Price Labor	Unit Price Materials	Labor & Materials	Extended Bid Price Labor & Materials
A1-1	Mobilization (Setting Up Facilities, Utilities and Controls), Site Office and Security	1	Lot	\$ 22,606.57	\$	\$22,606.57	\$22,606.57
A1-2	Removal of existing transformers "T1" and "T1A" and associated control cabling	1	Lot	\$ 28,241.48	\$	\$28,241.48	\$28,241.48
A1-3	Removal of existing transformer deluge system	1	Lot	\$ 4,791.61	\$	\$4,791.61	\$4,791.61
A1-4	Removal of transformer deluge system foundations	1	Lot	\$ 5,989.51	\$	\$5,989.51	\$5,989.51
A1-5	Removal of medium-voltage bus duct associated with transformers "T1" and "T1A"	1	Lot	\$ 7,986.01	\$	\$7,986.01	\$7,986.01
A1-6	Covering and weather-sealing of bus duct entrance at the exterior wall of the Blue Valley Power Plant	1	Lot	\$ 614.31	\$ 318.56	\$932.87	\$932.87
A1-7	69kV 20MVAR Capacitors Bank Installation	1	Lot	\$ 8,437.15	By Others	\$8,437.15	\$8,437.15
A1-8	Capacitors Bank Protection Panel Installation	1	Lot	\$ 1,612.56	By Others	\$1,612.56	\$1,612.56
A1-9	69kV 20MVAR Capacitors Bank Foundation Installation	1	Lot	\$ 7,980.57	\$ 3,591.89	\$11,572.46	\$11,572.46
A1-10	Below Grade Conduits, Fittings and Stub-ups	1	Lot	\$ 2,387.03	\$ 1,167.79	\$3,554.82	
A1-11	Overhead Conductor, Fittings, and Connectors	1	Lot	\$ 5,068.05	\$ 9,556.70	\$14,624.75	\$14,624.75
A1-12	Control and power cable	1	Lot	\$19,884.32	\$18,422.77	\$38,307.09	\$38,307.09
A1-13	Ground Grid Conductor, Fittings, and Connectors	1	Lot	\$1,228.62	\$ 5,256.19	\$6,484.80	\$6,484.80
A1-14	Indoor Cable Tray Installation	1	Lot	\$2,034.90	\$7,963.92	\$9,998.82	\$9,998.82
A1-15	AC Lighting Panel Installation		Lot	\$691.10	\$3,981.96	\$4,673.06	\$4,673.06
A1-16	Identification Tags	1	Lot	\$ 230.37	\$ 382.27	\$612.63	\$612.63
A1-17	Testing	1	Lot	\$ 62,118.56	\$	\$62,118.56	\$62,118.56
TOTAL THIS PAGE							\$232,544.74



Item No.	Description	Qty.	Unit	Unit Price Labor	Unit Price Materials	Labor & Materials	Extended Bid Price Labor & Materials
BLANK LINE ITEMS BELOW FOR OTHER ITEMS ASSIGNED BY CONTRACTOR							

TOTAL THIS PAGE

TOTAL SUBSTATION A EXTENDED LABOR & MATERIALS \$232,544.74

**PRICE ADJUSTMENTS SUBSTATION A - ADDITIONS**

<b>Item No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Price Labor</b>	<b>Unit Price Materials</b>	<b>Labor &amp; Materials</b>	<b>Extended Bid Price Labor &amp; Materials</b>
PA-1	Price Per Cubic Yard of Earthwork Excavation, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 38.39	\$	\$38.39	\$38.39
PA-2	Price Per Cubic Yard of Earthwork Backfill, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 38.39	\$ 44.60	\$82.99	\$82.99
PA-3	Price per Cubic Yard of Crushed Rock Surface Regrading In Accordance With These Construction Documents, If Price Per Ton Please Specify	1	Cu. yd	\$ 38.39	\$ 57.34	\$95.73	\$95.73
PA-4	Price Per Yard of Reinforced Concrete, Supplied And Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 2,472.00	\$	\$2,472.00	\$2,472.00
PA-5	4/0 Copper Ground Wire Price Adjustment	10	ft	\$ 10.24	\$ 38.23	\$48.47	\$484.70
PA-6	Cadweld Connection: Cable to Riser	1	Ea	\$ 51.19	\$ 127.42	\$178.62	\$178.62
PA-7	Cadweld Connection: Cable to Ground Rod	1	Ea	\$ 51.19	\$ 127.42	\$178.62	\$178.62
PA-8	Control Cable 2/C #10	100	Ft.	\$ 2.73	\$ 3.19	\$5.92	\$592.00
PA-9	Terminations Control Cable 2/C #10	2	Term.	\$ 25.60	\$ 1.27	\$26.87	\$53.74
PA-10	Control Cable 4/C #10	100	Ft.	\$ 3.07	\$ 3.19	\$6.26	\$626.00
PA-11	Terminations Control Cable 4/C #10	8	Term.	\$ 25.60	\$ 1.27	\$26.87	\$214.96
PA-12	Control Cable 12/C #12	100	Ft.	\$ 3.51	\$ 5.10	\$8.61	\$861.00
PA-13	Terminations Control Cable 12/C #12	24	Term.	\$ 25.60	\$ 1.27	\$26.87	\$644.89
PA-14	Control Cable 1/C 4/0	10	Ft.	\$ 3.51	\$ 15.29	\$18.80	\$1,880.00
PA-15	Terminations Control Cable 1/C 4/0	2	Term.	\$ 38.39	\$ 1.91	\$40.31	\$80.61
PA-16	Control Cable 2 pair #18	1	Ft.	\$ 0.65	\$ 2.55	\$3.20	\$3.20
PA-17	Terminations Control Cable 2 pair #18	1	Term.	\$ 102.38	\$ 5.10	\$107.48	\$107.48
PA-18	Control Cable 8 par #18	1	Ft.	\$ 0.77	\$ 5.10	\$5.86	\$5.86
PA-19	Terminations Control Cable 8 pair #18	1	Term.	\$ 409.54	\$ 20.39	\$429.93	\$429.93
PA-20	Communications COAX Cable	1	Ft.	\$ 3.07	\$ 5.10	\$8.17	\$8.17
PA-21	Terminations COAX Cable	1	Term.	\$ 51.19	\$ 5.10	\$56.29	\$56.29
PA-22	2" PVC Sch. 40 Conduit	10	Ft.	\$ 22.67	\$ 7.75	\$30.42	\$304.20
PA-23	2" RGS Conduit	1	Ft	\$ 15.36	\$ 14.12	\$29.48	\$29.48
PA-24	Installation of Bolted Fitting	1	Ea	\$ 153.58	\$		
PA-25	Installation of Welded Fitting	1	Ea	\$ 153.58	\$		

Material Price is dependent on actual fitting: Cost + 15%

**PRICE ADJUSTMENTS SUBSTATION A - DEDUCTIONS**

<b>Item No.</b>	<b>Description</b>	<b>Qty.</b>	<b>Unit</b>	<b>Unit Price Labor</b>	<b>Unit Price Materials</b>	<b>Labor &amp; Materials</b>	<b>Extended Bid Price Labor &amp; Materials</b>
PD-1	Price Per Cubic Yard of Earthwork Excavation, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 32.64	\$	\$32.64	\$32.64
PD-2	Price Per Cubic Yard of Earthwork Backfill, Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 32.64	\$ 37.91	\$70.54	\$70.54
PD-3	Price per Cubic Yard of Crushed Rock Surface Regrading In Accordance With These Construction Documents, If Price Per Ton Please Specify	1	Cu. yd	\$ 32.64	\$ 48.74	\$81.37	\$81.37
PD-4	Price Per Yard of Reinforced Concrete, Supplied And Installed In Accordance With These Construction Documents	1	Cu. yd	\$ 2,101.20	\$	\$2,101.20	\$2,101.20
PD-5	4/0 Copper Ground Wire Price Adjustment	10	ft	\$ 8.70	\$ 32.49	\$41.20	\$412.00
PD-6	Cadweld Connection: Cable to Riser	1	Ea	\$ 43.51	\$ 108.31	\$151.82	\$151.82
PD-7	Cadweld Connection: Cable to Ground Rod	1	Ea	\$ 43.51	\$ 108.31	\$151.82	\$151.82
PD-8	Control Cable 2/C #10	100	Ft.	\$ 2.32	\$ 2.71	\$5.03	\$503.00
PD-9	Terminations Control Cable 2/C #10	2	Term.	\$ 21.76	\$ 1.08	\$22.84	\$45.68
PD-10	Control Cable 4/C #10	100	Ft.	\$ 2.61	\$ 2.71	\$5.32	\$532.00
PD-11	Terminations Control Cable 4/C #10	8	Term.	\$ 21.76	\$ 1.08	\$22.84	\$182.72
PD-12	Control Cable 12/C #12	100	Ft.	\$ 2.98	\$ 4.33	\$7.32	\$732.00
PD-13	Terminations Control Cable 12/C #12	24	Term.	\$ 21.76	\$ 1.08	\$22.84	\$548.16
PD-14	Control Cable 1/C 4/0	10	Ft.	\$ 2.98	\$ 13.00	\$15.98	\$1,598.00
PD-15	Terminations Control Cable 1/C 4/0	2	Term.	\$ 32.64	\$ 1.62	\$34.26	\$68.52
PD-16	Control Cable 2 pair #18	1	Ft.	\$ 0.56	\$ 2.17	\$2.72	\$2.72
PD-17	Terminations Control Cable 2 pair #18	1	Term.	\$ 87.03	\$ 4.33	\$91.36	\$91.36
PD-18	Control Cable 8 par #18	1	Ft.	\$ 0.65	\$ 4.33	\$4.99	\$4.99
PD-19	Terminations Control Cable 8 pair #18	1	Term.	\$ 348.11	\$ 17.33	\$365.44	\$365.44
PD-20	Communications COAX Cable	1	Ft.	\$ 2.61	\$ 4.33	\$6.94	\$6.94
PD-21	Terminations COAX Cable	1	Term.	\$ 43.51	\$ 4.33	\$47.85	\$47.85
PD-22	2" PVC Sch. 40 Conduit	10	Ft.	\$ 19.27	\$ 6.59	\$25.86	\$258.60
PD-23	2" RGS Conduit	1	Ft	\$ 13.05	\$ 12.00	\$25.05	\$25.05
PD-24	Installation of Bolted Fitting	1	Ea	\$ 130.54	\$		
PD-25	Installation of Welded Fitting	1	Ea	\$ 130.54	\$		

Material Price is dependent on actual fitting: Cost pass through

## BID SUMMARY SHEET

All bid pricing shall be stated as a maximum not-to-exceed price which includes all mobilization, demobilization, transportation, labor, technical expertise, equipment, materials and all other expenses, including administrative costs, by bidder and any necessary subcontractors needed for completion of each particular portion of the work. Pricing will not include any owner supplied labor or materials set out in the specifications.

Vendor: Emerald Electrical Consultants, LLC

Project: Substation A Cap Bank

1. Base Bid	<u>\$ 232,544.74</u>
a. Equipment Cost	<u>\$ 36,666.43</u>
b. Labor Cost	<u>\$ 85,555.01</u>
c. Sub-Contractor Cost	<u>\$ 80,750.00</u>
i. Percentage of Project	<u>34.7%</u>
d. Mobilization Cost	<u>\$ 22,606.57</u>
i. Lead Time	<u>31 Weeks</u>
e. Performance Bond Cost	<u>\$ 6,966.73</u>
2. Force Account Allowance (Total Cost * 10%)	<u>\$ 23,254.47</u>
3. Total Not-To-Exceed Cost	<u>\$ 255,799.21</u>

Substation A Cap Bank

07-Mar-22 21:28

Activity ID	Activity Name	Original Duration	Start	Finish	Calendar	2022												2023	
						Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	
<b>22-019</b>	<b>Substation A Cap Bank</b>	224.0	08-Mar-22	13-Jan-23	5x10	[Gantt Chart showing project progress from Mar 2022 to Jan 2023]													
A1000	Bid Submission	0.0	08-Mar-22*		5x10	[Gantt bar for Bid Submission]													
A1010	City Council Review	30.0	08-Mar-22	18-Apr-22	5x10	[Gantt bar for City Council Review]													
A1020	Submittal Prep	30.0	19-Apr-22	30-May-22	5x10	[Gantt bar for Submittal Prep]													
A1030	Submittal Review	15.0	31-May-22	20-Jun-22	5x10	[Gantt bar for Submittal Review]													
A1040	Material Procurement	110.0	21-Jun-22	21-Nov-22	5x10	[Gantt bar for Material Procurement]													
A1050	Mobilize	3.0	22-Nov-22	24-Nov-22	5x10	[Gantt bar for Mobilize]													
A1060	Demo Existing Equipment	3.0	25-Nov-22	29-Nov-22	5x10	[Gantt bar for Demo Existing Equipment]													
A1070	Install Foundations	5.0	30-Nov-22	06-Dec-22	5x10	[Gantt bar for Install Foundations]													
A1075	Install Conduit/Grounding	2.0	07-Dec-22	08-Dec-22	5x10	[Gantt bar for Install Conduit/Grounding]													
A1080	Install Cap Banks	10.0	13-Dec-22	26-Dec-22	5x10	[Gantt bar for Install Cap Banks]													
A1090	Install Cable Tray	2.0	09-Dec-22	12-Dec-22	5x10	[Gantt bar for Install Cable Tray]													
A1100	Pull Cable	3.0	27-Dec-22	29-Dec-22	5x10	[Gantt bar for Pull Cable]													
A1110	Terminate	1.0	30-Dec-22	30-Dec-22	5x10	[Gantt bar for Terminate]													
A1120	Install Jumpers	1.0	27-Dec-22	27-Dec-22	5x10	[Gantt bar for Install Jumpers]													
A1130	Test	10.0	02-Jan-23	13-Jan-23	5x10	[Gantt bar for Test]													

- Actual Level of Effort
- Remaining Work
- Actual Work
- Critical Remainin...

**AFFIDAVIT OF COMPLIANCE  
WITH IMMIGRATION LAW**

STATE OF Georgia )  
 )  
COUNTY OF Fulton )

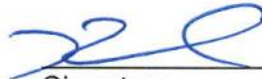
THE UNDERSIGNED Ryan Truitt, of lawful age and being  
first duly sworn, states upon oath that (s)he is the

Vice-President of Operations

Title

of Emerald Electrical Consultants, LLC, the Contractor  
Name of Company

submitting the attached bid/proposal and that the Contractor is enrolled and  
participates in a federal work authorization program with respect to the  
employees who will perform work under the contract and that the Contractor  
does not knowingly employ to perform work under this contract any person who  
is an unauthorized alien.

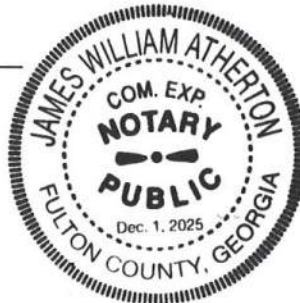


Signature

Subscribed and sworn to before me, a Notary Public, in and for the County and  
State aforesaid, this 8th day of March, 2022.

  
Notary Public

My Commission Expires: 12-1-25



AFFIDAVIT

STATE OF Georgia )  
 ) SS.  
COUNTY OF Fulton )

Ryan Truitt \_\_\_\_\_ of the City of Roswell \_\_\_\_\_  
\_\_\_\_\_, County of Fulton \_\_\_\_\_, State of Georgia \_\_\_\_\_,

being duly sworn on her or his oath, deposes and says:

1. That I am the Vice-President of Operations (Title of Affiant) of Emerald Electrical Consultants, LLC (Name of Bidder) and have been authorized by said bidder to make this affidavit on the bidder's behalf;
2. No Councilmember, City Manager, Director of Finance and Administration, City Procurement Manager, or any City employee is financially interested in what the bidder is offering to sell to the City pursuant to this invitation, nor is the bidder a City employee or board member whose bid creates a conflict of interest. A conflict of interest would arise if any person named in this section is in a position to affect either the decision to solicit bids or the selection of the successful bidder;
3. Bidder has not participated in collusion or committed any act in restraint of trade, directly or indirectly, which bears upon anyone's response or lack of response to this Invitation; and
4. Bidder is responsible for submitting with his or her bid a record of any discussion with a Councilmember, City Manager, Director of Finance and Administration, City Procurement Manager, or any other City employee regarding this invitation; and
5. The authorized signer of this document certifies that the organization and each of its principals are not suspended or debarred by the City of Independence, State of Missouri or Federal government.

Emerald Electrical Consultants, LLC (Name of Bidder)

By: [Signature] (Signature of Affiant)

Vice-President of Operations (Title of Affiant)

Subscribed and sworn to before me this 8th day of March, 2022.

(SEAL) [Signature]

NOTARY PUBLIC in and for the County of Fulton

State of Georgia

My commission expires: 12-1-25



**AFFIDAVIT  
ACCEPTANCE OF TERMS AND CONDITIONS**

STATE OF Georgia )  
 ) SS.  
COUNTY OF Fulton )

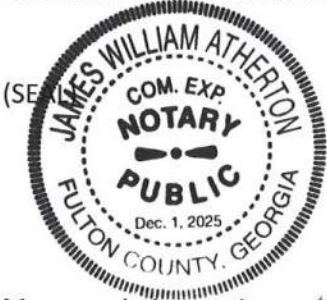
Ryan Truitt of the City of Roswell  
\_\_\_\_\_, County of Fulton, State of Georgia,

being duly sworn on her or his oath deposes and says:

1. That I am the Vice-President of Operations (Title of Affiant) of Emerald Electrical Consultants, LLC (Name of Bidder) and have been authorized by said bidder to make this affidavit on the bidder's behalf;
2. Bidder understands and acknowledges that acceptance of the City of Independence Terms and Conditions is required in order to be considered for award of this solicitation; and
3. Bidder accepts the City of Independence Terms and Conditions without any exceptions.

Emerald Electrical Consultants, LLC (Name of Bidder)  
By: [Signature] (Signature of Affiant)  
Vice-President of Operations (Title of Affiant)

Subscribed and sworn to before me this 8th day of March, 2022



James William Atherton

NOTARY PUBLIC in and for the County of Fulton

State of Georgia

My commission expires: 12-1-25



AFFIDAVIT OF COMPLETION OF OSHA CONSTRUCTION SAFETY PROGRAM

STATE OF Georgia )  
COUNTY OF Fulton ) ss.

I, Ryan Truitt, do hereby authenticate that I am a duly authorized agent of Emerald Electrical Consultants, LLC and I have all requisite power and authority to execute and deliver this Affidavit and am competent to testify to the matters stated herein on behalf of Emerald Electrical Consultants, LLC.

Emerald Electrical Consultants, LLC has provided a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Missouri Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program for employees that have not previously completed the required program and, and will require all employees who have not previously completed the required program to complete the program within sixty days (60) of beginning work on any construction project for the City of Independence, Missouri.

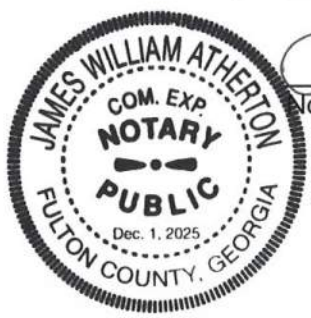
Any employee found on a work site subject to this section without documentation of the successful completion of the course required under Missouri Revised Statute 292.675 shall be afforded twenty days to produce such documentation before being subject to removal from the project.

The contractor shall forfeit as a penalty to the City of Independence two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training. The City of Independence shall withhold and retain therefrom all sums and amounts due and owing as a result of any violation of this section when making payments to the contractor under the contract.

By:   
Ryan Truitt  
Printed Name  
Emerald Electrical Consultants, LLC  
Company

Subscribed and sworn to before me this 8<sup>th</sup> day of March, 2022.

My Commission Expires:  
12-1-25



  
Notary Public



AIA Document A310

# Bid Bond

**KNOW ALL MEN BY THESE PRESENTS**, that **Emerald Electrical Consultants, LLC**  
**2575 Jason Industrial Parkway, Suite C, Winston, GA 30187**

as Principal, hereinafter called the Principal, and **The Gray Casualty & Surety Company**

a corporation duly organized under the laws of the State of **Louisiana**

as Surety, hereinafter called the Surety, are held and firmly bound unto **The City of Independence**

as Obligee, hereinafter called the Obligee, in the sum of **Five Percent of Amount Bid**


Dollars(\$5%),

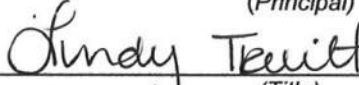
for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.


WHEREAS, the Principal has submitted a bid for **Substation A Capacitor Bank Construction**


NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

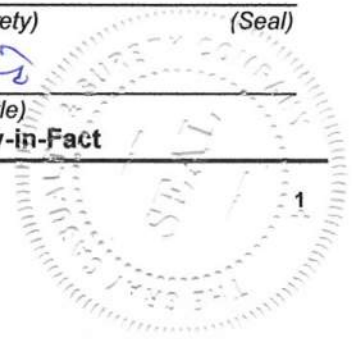
Signed and sealed this **8th** day of **March**, **2022**.

  
\_\_\_\_\_  
*(Witness)*  
**RYAN TRUITT**

**Emerald Electrical Consultants, LLC**  
\_\_\_\_\_  
*(Principal)* *(Seal)*  
  
\_\_\_\_\_  
*(Title)*  
**President / CEO**

  
\_\_\_\_\_  
*(Witness)*  
**Nicole Lovett**

**The Gray Casualty & Surety Company**  
\_\_\_\_\_  
*(Surety)* *(Seal)*  
  
\_\_\_\_\_  
*(Title)*  
**Mark E. Harris, Attorney-in-Fact**



**THE GRAY INSURANCE COMPANY  
THE GRAY CASUALTY & SURETY COMPANY**

**GENERAL POWER OF ATTORNEY**

**Bond Number:** Bid Bond                      **Principal:** Emerald Electrical Consultants, LLC

**Project:** Substation A Capacitor Bank Construction

KNOW ALL BY THESE PRESENTS, THAT The Gray Insurance Company and The Gray Casualty & Surety Company, corporations duly organized and existing under the laws of Louisiana, and having their principal offices in Metairie, Louisiana, do hereby make, constitute, and appoint: **Joseph Madden III, Richard L. Powell, Richard L. Powell Jr., Mark E. Harris, Keith W. Brown, W.W. Jones II, Tona Jo Hunter, Cooper W. Permenter, Daniel B. Dickens, and Ric Stallings of Memphis, Tennessee jointly and severally** on behalf of each of the Companies named above its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its deed, bonds, or other writings obligatory in the nature of a bond, as surety, contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract of suretyship executed under this authority shall exceed the amount of \$15,000,000.00.

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both The Gray Insurance Company and The Gray Casualty & Surety Company at meetings duly called and held on the 26<sup>th</sup> day of June, 2003.

“RESOLVED, that the President, Executive Vice President, any Vice President, or the Secretary be and each or any of them hereby is authorized to execute a power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Company bonds, undertakings, and all contracts of surety, and that each or any of them is hereby authorized to attest to the execution of such Power of Attorney, and to attach the seal of the Company; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Company may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be binding upon the Company now and in the future when so affixed with regard to any bond, undertaking or contract of surety to which it is attached.

IN WITNESS WHEREOF, The Gray Insurance Company and The Gray Casualty & Surety Company have caused their official seals to be hereinto affixed, and these presents to be signed by their authorized officers this 28<sup>th</sup> day of October, 2021.



By:

Michael T. Gray  
President  
The Gray Insurance Company

Cullen S. Piske  
President  
The Gray Casualty & Surety Company



State of Louisiana

ss:

Parish of Jefferson

On this 28<sup>th</sup> day of October, 2021, before me, a Notary Public, personally appeared Michael T. Gray, President of The Gray Insurance Company, and Cullen S. Piske, President of The Gray Casualty & Surety Company, personally known to me, being duly sworn, acknowledged that they signed the above Power of Attorney and affixed the seals of the companies as officers of, and acknowledged said instrument to be the voluntary act and deed, of their companies.



Leigh Anne Henican  
Notary Public  
Notary ID No. 92653  
Orleans Parish, Louisiana

Leigh Anne Henican  
Notary Public, Parish of Orleans State of Louisiana  
My Commission is for Life

I, Mark S. Manguno, Secretary of The Gray Insurance Company, do hereby certify that the above and forgoing is a true and correct copy of a Power of Attorney given by the companies, which is still in full force and effect. IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Company this 8<sup>th</sup> day of March, 2022.

I, Leigh Anne Henican, Secretary of The Gray Casualty & Surety Company, do hereby certify that the above and forgoing is a true and correct copy of a Power of Attorney given by the companies, which is still in full force and effect. IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Company this 8<sup>th</sup> day of March, 2022.



## Project Experience

- **Brandy Branch T2 Project –**

- Client: Jacksonville Electric Authority
- Location: Jacksonville, FL
- Value: \$547,972.62
- Description: Extend the 230kV breaker and a half bus and install two new 230kV terminals. Install new 230/26kV 50 MVA transformer including new low side breaker, three feeders and bus tie breaker
- Scope: Installation scope includes all concrete foundation work (spread footers, drilled piers, breaker pads, and Xfmr pad), cable trench, ground grid, new oil containment system, 5-230kV switches, 2-230kV 50kA breakers, welded 4" aluminum bus. Pull all control cable to new equipment and perform all wiring/termination work in the equipment and relay panels.



- **Steelbald T3 Project –**

- Client: Jacksonville Electric Authority
- Location: Jacksonville, FL
- Value: \$716,080.61
- Description: Remove existing 230/26kV transformer and lowside structure including all concrete foundations. Install new 230/26kV 50 MVA transformer and new lowside switchyard with three 26kV feeders.
- Scope: Installation scope includes all concrete work, new oil containment system, ground grid, conduit, steel, switches and aluminum bus. Pull and terminate control cable to new equipment and relay panels.



- **Dent Rd SS –**

- Client: City of Garland
- Location: Greenville, TX
- Value: \$506,733.47
- Description: Construction of new 5 terminal 138kV ring bus, new 138/69kV transformer and 69kV lowside breaker.
- Scope: Installation scope includes all cable trench, below grade conduit, and below grade grounding. Install all steel, 6" aluminum bus (swage connected), insulators, switches, and jumpers. Install all above grade conduit, above grade grounding, and junction boxes. Pull all new control cable and terminate.



- **Boomer Lake SS –**

- Client: Stillwater Utility Commission
- Location: Stillwater, OK
- Value: \$342,448.16
- Description: 69/13kV transformer replacement and split the lowside bus.
- Scope: Remove existing 69/13kV transformer and underground power cable connected to decommissioned power plant. Install new 69/13kV 22 MVA LTC transformer, new lowside breaker and bus tie breaker. Installation scope includes new oil containment system, all concrete foundation work, ground grid, conduit and control cable. Modify the protection and

control scheme to facilitate the lowside bus being split. Test and commission newly installed equipment and protection scheme.

- **Nocatee SS –**

- Client: Jacksonville Electric Authority
- Location: Jacksonville, FL
- Value: \$1,285,612.77
- Description: Construction of a new 230/26kV substation. 4 element 230kV ring bus, new 230/26kV 50 MVA LTC transformer and 3 – 26kV feeders.
- Scope: Installation scope includes all concrete foundation work (spread footers, piers, breaker pads, and Xfmr pad). Install oil containment. Install cable trench, below grade conduit, and below grade grounding. Install all steel, bus, insulators, switches, and jumpers. Install all above grade conduit, above grade grounding, and junction boxes. Pull all cable and terminate. Install Relay Panels, cable tray, and wall panels. Install 6" duct bank system (including man holes) from the highway to substation (approximately 2000 ft.).





- **Brookston SS –**

- Client: Lamar County Electric Coop
- Location: Paris, TX
- Value: \$262,622.74
- Description: Expand the existing substation and add a third 138/25kV transformer with one 25kV feeder.
- Scope: Install all below grade conduit and below grade grounding. Install above grade conduit and above grounding. Install steel, bus, insulators, and switches. Install switcher and breaker. Pull cable and terminate.



- **Field Street Cap Bank –**

- Client: City of New Smyrna

- Location: New Smyrna Beach, FL
- Value: \$184,717.34
- Description: Install a new 30 MVAR 115kV Cap static capacitor bank.
- Scope: Modify existing bus and tap to new 115kV switch and 145kV breaker with SCU (Independent pole operated). Scope includes all concrete foundation work, conduit, instrument transformers, control cable and wiring.
- **Hamilton Street Breakers –**
  - Client: Jacksonville Electric Authority
  - Location: Jacksonville, FL
  - Value: \$65,804.15
  - Description: Replace 5 - 26kV feeder breakers
  - Scope: Remove existing feeders, above grade conduit and control cable. Install new 26kV breakers on existing foundations. Install new jumpers, new control cable and perform all wiring.
- **Wauchula Xfmr Addition –**
  - Client: City of Wauchula
  - Location: Wauchula, FL
  - Value: \$195,510.29
  - Description: Install new 69/23kV transformer with 69kV Circuit Switcher. Install new 23kV bus system to incorporate the existing lowside bus. Remove the existing single phase 69/23kV transformers and 69kV OCB.
  - Scope: Install transformer concrete foundation and oil containment. Install pier foundations. Install all steel, bus, insulators, and switches. Install circuit switcher. Install below grade conduit and above grade conduit. Install below grade grounding and above grade grounding. Remove existing 69kV steel, strain bus, and jumpers. Pull Cable and terminate. Re-wire existing relay panel and SCADA panel.
- **Hord Xfmr Addition –**
  - Client: Kissimmee Utility Authority
  - Location: Kissimmee, FL
  - Value: \$241,875.85
  - Description: Add third 69/13kV transformer.
  - Scope: Install xfmr concrete foundation and oil containment system. Install foundations for the new 11 position switchgear and enclosed 13kV capacitor bank. Install concrete piers and breaker pads. Install below grade conduit and above grade conduit. Install steel, bus, insulators, and switches. Install 2 new 69kV breakers. Install 6" duct bank system from Switchgear to associated equipment. Install 2000 mcm 15kV cable and terminate. Pull control cable and terminate.





- **Golden Pass GIS –**

- Client: Siemens Energy
- Location: Houston, TX
- Value: \$1,247,710.59
- Description: Install new 12 breaker ring and 6 breaker ring configuration GIS. Installation includes all load center cabinets and wiring. GIS rated for 145kV.
- Scope: Install all GIS equipment and load center cabinets. Ground all equipment. Pull all cable and terminate. Provide testing support throughout all phases.



- **Seabrook Generators –**

- Client: Seabrook Utility Commission
- Location: Seabrook Island, SC
- Value: \$123,892.87
- Description: Install (3) new Generators at Pump Stations. All Generators are on Concrete pads. Install new ATS and re-wire existing system to incorporate Generators.

- Scope: Install concrete pads for generators. Install steel and panels/ATS. Install all conduit and grounding. Pull Cable and Terminate.
- **Reservoir SS –**
  - Client: FPL West
  - Location: Labelle, FL
  - Value: \$962,316.53
  - Description: Construction of greenfield substation. Install (2) XFMR's with oil containment systems. Install 230kV steel, aluminum bus, and (5) 230kV switches. Install 23kV steel and associated bus, switches, and insulators. Install (5) 23kV breakers. Install (3) 23kV Regulator Sets. Install ground grid system. Install Cable Trench and conduit system.
  - Scope: Install all concrete foundation work (spread footers, piers, breaker pads, and Xfmr pad). Install oil containment systems. Install cable trench, below grade conduit, and below grade grounding. Install all steel, bus, insulators, switches, and jumpers. Install all above grade conduit, above grade grounding, and junction boxes. Pull all cable and terminate.
- **Gulf Power Wireman T&E –**
  - Client: Gulf Power
  - Location: Destin, FL
  - Value: \$100,000.00
  - Description: Perform ongoing Wireman activities on a T&E basis for Gulf Power. This includes pulling new cable, terminate cable, wiring relay panels and electrical equipment.
  - Scope: Pull cable and terminate
- **FPL Palm County Maintenance –**
  - Client: FPL Palm County
  - Location: West Palm Beach, FL
  - Value (to Date): \$900,415.42
  - Description: Perform ongoing maintenance & construction activities for FPL Palm Beach. Most projects are install new distribution feeder bays in existing substations. Some projects also include adding new XFMR bays. We have performed over 15 feeder bay projects and 2 XFMR addition projects in Palm Beach county. We have also performed numerous breaker replacements and switch replacements.
  - Scope: Install all above grade conduit and grounding. Install steel, bus, insulators, and switches. Install breakers and regulators. Install ACLC and Dymec Boxes. Pull cable and terminate



## Client Reference

- **FPL**
  - Bryan Potazcek (Construction Lead Palm County)
    - Email: Bryan.Potazcek@fpl.com
    - Phone #: 561-722-1359
  - Kevin (Construction Lead PC Gulf)
    - Email: kevin.dutton@fpl.com
    - Phone #: 850-832-7994
- **Jacksonville Electric Authority**
  - Kory Blue
    - Email: blueks@jea.com
    - Phone #: 904-719-3010
  - Brandy Smith
    - Email: smitbl2@jea.com
    - Phone #: 904-665-7987
- **Siemens Energy**
  - Antonio Loo (Inspector)
    - Email: antonioloo\_vazques@siemens.com
    - Phone #: 919-397-0383
- **Patterson & Dewar**
  - Anthony Hanson
    - Email: Ahanson@pdengineers.com
    - Phone #: 615-838-4197
- **City of Wauchula**
  - Chris Collier
    - Email: ccollier@cityofwauchula.com
    - Phone #: 863-781-5584
- **Seabrook Utility Commission**
  - Walt Fletcher
    - Email: wfletcher@wkdickson.com
    - Phone #: 843-628-5864
- **City of Edmond**
  - Jerry Cockrell
    - Email: jerry.cockrell@edmondok.com
    - Phone #: 405-517-2910
- **Burns & MacDonald**
  - John McCleery



- Email: [jsmccleery@burnsmcd.com](mailto:jsmccleery@burnsmcd.com)
- Phone #: 817-840-1224
- **Jingoli Power**
  - Matthew Keiper
    - Email: [mkeiper@jingolipower.com](mailto:mkeiper@jingolipower.com)
    - Phone #: 717-446-1134
  - John Trainor
    - Email: [jtrainor@jingolipower.com](mailto:jtrainor@jingolipower.com)
    - Phone #: 302-258-4173

# WBENC

WOMEN'S BUSINESS ENTERPRISE  
NATIONAL COUNCIL

JOIN FORCES. SUCCEED TOGETHER.

hereby grants

# National Women's Business Enterprise Certification

to

Emerald Electrical Consultants LLC

who has successfully met WBENC's standards as a Women's Business Enterprise (WBE).  
This certification affirms the business is woman-owned, operated and controlled and is valid through the date herein.

WBENC National WBE Certification was processed and validated by Greater Women's Business Council, a WBENC Regional Partner Organization.

Certification Granted: September 11, 2020  
Expiration Date: September 30, 2022  
WBENC National Certification Number: WBE2002260



Authorized by Roz Lewis, President & CEO  
Women's Business Center



NAICS: 237130  
UNSPSC: 72141126, 72151502, 72152710



# MATTHEW RYAN GARNER

9110 Par Dr Douglasville, Ga ● (404) 638-4671 ● mgarner@emerald-power.com

www.linkedin.com/in/mrgarner

## PROFESSIONAL EXPERIENCE:

Emerald Electrical Consultants, LLC

Winston, GA

### ***Vice President of Construction***

January 2019–Present

- Executes business development activities for new prospective clients.
- Management of labor force which includes hiring, firing, review of performance, and coordination of location.
- Management of fleet/tooling assets
- Plays an integral role in all financial decisions made for the company.
- Testing engineer for all testing the company does.

Henkels & McCoy

Chattanooga, TN

### ***Regional Manager***

July 2017–January 2019

- Lead efforts to manage \$60 million worth of substation, transmission line, and distribution line construction services.
- Responsible for profit and loss across a 14-state region.
- Build rapport with electric utilities across the region to sustain and grow revenue.
- Manage efforts to bid and successfully win new contracts.
- Lead a skilled construction labor force of approximately 300 employees including substation and line construction personnel.

### **Accomplishments**

- Annual revenue increased by 78% (\$32 million to \$57 million) from FY 2017 to FY 2018

Ampirical Solutions, LLC

Madisonville, LA

### ***Manager, System Protection & Control***

June 2016 – July 2017

- Successfully led team of 35 engineers and 12 drafters in executing \$10+ million in engineering service work for electric utilities across the United States.
- Provided leadership and oversight for substation construction activities on all EPC projects (Engineer, Procure, Construct).
- Managed all bidding of substation engineering and construction work.
- Executed business development activities resulting in revenue growth for top 3 clients.

### **Accomplishments**

- Grew margin for engineering design team by 2% (\$200k) over a one-year period by implementing a technical training curriculum for engineers with 1-2 years of design experience.

Black Hills Energy

Pueblo, CO

### ***Director of Electric Operations***

March 2015 – June 2016

- Responsible for all substation, transmission line, distribution line and fleet work across the Black Hills Energy service area in southern Colorado which includes over 100,000 meters, and organization of 250 employees and a \$60 million annual budget.
- Led efforts in negotiating contracts with the local union and settling all disputes.
- Managed all contract work including the bidding, awarding/execution, and administration contract services to construction substations and powerlines.

### **Accomplishments**

- Led efforts to develop and implement an availability plan for linemen on-call resulting in a 22% improvement in system reliability (SAIDI & SAIFI) in less than one year.

Gulf Power

Pensacola, FL

### ***Construction Manager***

March 2011 – March 2015

- Managed all aspects of a \$100+ million annual substation and line construction budget.
- Led efforts to improve the OSHA recordable incident rate from 7.12 to 2.02 while working 250,000 man-hours annually.
- Responsible for managing the performance of 12 direct reports and an organization with over 200 employees.
- Led all contracting activities for the construction of substations, power lines, and inspections.

## **Accomplishments**

- Successfully built the construction organization from scratch by strategically developing the organization structure and effectively recruiting and placing key people in roles where they could deliver top results.
- Developed contract structure to have all contract inspection work to be bid and awarded to one supplier on a three-year cycle reducing spend by \$240k annually.
- Led efforts in the development and implementation of a contract administration process resulting in improved adherence to executed contracts and increased accuracy in financial reporting.

Georgia Power

Atlanta, GA

***Supervisor / Electrical Engineer***

December 2001 – March 2011

- Led all substation construction and maintenance activities for the West Metro Atlanta area.
- Tested, commissioned, and maintained AC & DC protective power systems.
- Inspected, tested and repaired substation power equipment for an area that had over 300 in-service substations.

## **Accomplishments**

- Successfully led efforts to convert/upgrade the Plant Jack McDonough switchyard to facilitate the \$1.7 billion project to retire the coal plant and add 2880 MW's of gas generation. This included leading 3 full-time substation construction crews and 8 engineers in the installation of over 28 circuit breakers and 6 large power transformers over a three year period.

## **EDUCATION:**

University of Georgia

Athens, GA

***Degree: Bachelor of Science in Agricultural Engineering***

1998 - 2001



## Ryan Truitt, PMP, LEED AP.

---

**Education:** **Auburn University (Dec. 2010)** Auburn, Alabama  
Bachelor of Science in Building Science BSCI GPA: 3.83

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**Relevant Software:** Microsoft Office On-Screen Takeoff Primavera P6  
AutoCad/Revit Bluebeam Dynamics

---

**Certifications:** **PMP** **LEED AP**  
(Member #1706149) (Member #10385319)

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**Work Experience:** **Emerald Electrical Consultants, LLC** Winston, GA  
*VP of Operations* *May 2019 - Present*

- Responsible for Daily Operation of Company
- Managing Business Cash Flow, Overheads, Project spend, Billings, Invoicing, etc
- Responsible for Estimating Department
- Responsible for Project Operation – Schedules, Procurement, Change Orders, Billings, Communication, etc
- Maintain Business Relationships

**Henkels & McCoy** Chattanooga, TN  
*Sr. Project Manager* *April 2017 – May 2019*

- Responsibilities include Management of Projects in the Central-South Region. Projects include: Transmission, Substation, Distribution, and Underground. Project Management team of 7 employees.
- Responsible for Overhead Cost Accounts.
- Managed Accounts Receivable, Accounts Payable, and Aging
- Managed Overhead Salaries, Tooling Costs, Safety Costs, and Fleet Costs
- Responsible for Estimating Department for all projects in our area. Estimating team of 2 employees.
- Area includes: Florida, Georgia, South Carolina, North Carolina, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas, Tennessee, Kentucky, and Ohio
- Notable Projects include:
  - TVA Program, TN/MS/KY/AL - \$15,000,000/year
  - JEA Program, Jacksonville, FL - \$12,000,000/year
  - Southern Company Program, AL/GA - \$3,000,000/year
  - AEP
    - Lincoln-Berrywood 138kV, Columbus, OH - \$6,000,000 (2017-2018)
    - Flushing-Cambridge 138kV, Flushing, OH - \$38,000,000 (2017-2020)
    - City of Jackson 138kV, Jackson, OH - \$5,000,000 (2018-2019)
    - Valley Reinforcement 138kV, Benton Harbor, MI - \$42,000,000 (2018-2021)
  - FPL
    - Hialeah Distribution, Miami, FL - \$1,500,000 (2018)
    - Palm County Distribution, West Palm Beach, FL - \$2,500,000 (2018)
    - Aventure North Distribution, Miami, FL - \$1,000,000 (2018)
    - Aventure South Distribution, Miami, FL - \$1,000,000 (2018)
    - Seminola Distribution, Miami, FL - \$2,500,000 (2018)
  - PowerSouth
    - Salem-Bottom Mill, Ozark, AL - \$4,500,000 (2017-2018)
    - Park Crossing, Montgomery, AL - \$1,250,000 (2017)
  - GTC
    - Ellijay-Roundtop 230kV, Ellijay, GA - \$10,000,000 (2017)
    - Brookwood Substation, Cumming, GA - \$125,000 (2017)
    - Glassbridge Substation, LaGrange, GA - \$125,000 (2018)
    - Omega Substation, Omega, GA - \$150,000 (2018)
  - Storm
    - Hurricane Irma Relief, Florida - \$3,500,000 (2017)
    - Hurricane Florence Relief, South Carolina - \$250,000 (2018)
    - Hurricane Michael Relief, FL/SC/NC - \$TBD (2018)

**Service Electric Co.** Chattanooga, TN  
*Contract Manager/Lead T-Line Estimator/Project Manager* *February 2014 – March 2017*

- Responsibilities include Lead Estimator for all T-Line proposals, Managing T-Line Estimating Department, Reviewing Contracts with Customer/Quanta, Preparing Pre-qual packages, Managed T-Line projects, and Scheduler (P6) for Special Projects.
- Estimated/Managed Projects dealing with Transmission Services (Energized and De-Energized) ranging from 69kV to 765kV.
- Estimated/Managed Projects in the Ohio, Indiana, Kentucky, West Virginia, Virginia, Georgia, Alabama, Mississippi, Arkansas, Louisiana, Texas, and Oklahoma areas
- Management Responsibility included Performance Reporting, Schedule Updates, UVL, Financial Projections, Invoice Coding, and Change Order Management.
- Estimating Responsibility included Preparing Man Hour Estimates, Preparing Implementation Plans, Preparing Bid Schedules, Subcontractor tracking, Preparing Proposals, Coordinating Internal Review, and Coordinating Bid Interview with Customers.
- Scheduling Responsibilities include Creating Schedules, Incorporated Changes, Cost Loading for Billing Units, Updating Schedules, and Communicating Information to the Field Supervision.
- Notable Projects include:
  - Cartersville-Kingston 230kV, Cartersville, GA - \$5,000,000 (2017)
  - Marked Tree-Lepanto 115kV, Lepanto, AR - \$4,000,000 (2017)
  - TazMac/Fayette Area Improvements, Beckley, WV - \$60,000,000 (2016-2018)
  - Cedar Creek 115kV, Milledgeville, GA – \$1,000,000 (2016)
  - Newville 115kV Rebuild, Dothan, AL - \$1,000,000 (2016)
  - Cloverdale Tie Line 500kV, Roanoke, VA - \$2,500,000 (2016)
  - Chemical-Turner 138kV, Charleston, WV - \$11,000,000 (2015-2016)
  - Circleville Area Improvements, Circleville, OH - \$5,000,000 (2015-2016)
  - Hayden-Hyatt 345kV, Columbus, OH - \$5,000,000 (2014)
  - Linworth-Huntley 138kV, Columbus, OH - \$1,200,000 (2014)
  - Cherry Creek-Pemberton 69kV, Ghent, WV - \$1,500,000 (2014)

**Steel, LLC**

Atlanta, GA

*Project Manager**January 2010 – January 2013*

- Managed Projects Ranging from \$100,000 to \$24,000,000. With the average project being \$3,000,000.
- Responsible for direct communication with the GC/Owner, which included resolution of site issues, negotiation of cost issues, coordination of schedule, and coordination of drawings.
- Responsible for management of subs which include Joist/Deck, Misc. Fabrication, Erection, and Detailing.
- Responsible for Creating Schedules (Submittal, Fabrication, Delivery, & Installation), Sequencing, Change Order Request, Change Order's, Pay Apps to GC/Owner, PO/Subcontracts Downstream, RFI's, and Submittals.
- Responsible for Reviewing Invoices, Contracts with GC/Owner, Initial GC/Owner Schedule, and Scope of Work.
- Notable Projects include:
  - Amazon Distribution Center, Tampa, FL - \$24,000,000 (2013)
  - Miramar Towers, Miramar, FL - \$4,000,000 (2013)
  - Porsche HQ, Atlanta, GA - \$3,000,000 (2013)
  - Bahamar Resort, Nassau, Bahamas - \$4,000,000 (2012)
  - North Campus Electrical Utility, Ft. Meade, MD - \$2,500,000 (2012)
  - Atlanta Airport Concourse D Expansion, Atlanta, GA - \$5,000,000 (2012)
  - South Campus Electrical Utility, Ft. Meade, MD - \$2,000,000 (2012)
  - Biometrics Center, Clarksburg, WV - \$5,000,000 (2011)

**Cheyenne Steel**

Mobile, AL

*Foreman**May 2005 – Jan. 2010, F/T Seasonal*

- Responsible for managing crews ranging in size from 5 – 20 men.
- Attended sub-contractor meeting on a weekly basis and performed daily reports.
- Responsible for Schedule Performance Updates, Deliveries, and Equipment.
- Managed Erection Operation and Detailing Operation.
- Erecting Operations include: Installing Columns, Installing Beams, Plumbing Building, and Installing Guard Rails.
- Detailing Operations include: Bolt Up, Tightening Bolts, Installing Perimeter Angle, Installing and Detailing Deck, Installing and Detailing Stairs, Installing and Detailing Handrails, Welding.
- Notable Projects include:
  - Small Weapons Armory, Ft. Benning, GA Steel Erection Contractor (Summer 2010)

- Training Barracks, Ft. Jackson, SC Steel Erection Contractor (Summer 2009)
- Auburn Villages Dormitory Auburn, AL Steel Erection Contractor (Summer 2008)
- Robertsdale Middle School, Robertsdale, AL Steel Erection Contractor (Summer 2007)
- Harley Davidson Dealership, Daphne, AL Steel Erection Contractor (Summer 2006)
- Rave Theatres, Ft. Myers, FL Steel Erection Contractor (Summer 2005)

# RONALD PICKREN

Hazelhurst, Ga ● (404) 989-8766 ● rpickren@emerald-power.com

## PROFESSIONAL EXPERIENCE:

Emerald Electrical Consultants, LLC

Winston, GA

### **Supervisor**

March 2019 - Present

- Lead efforts to manage all aspects of substation construction work for electric utilities.
- Provide performance management for all electricians, operators, and apprentices on crew.
- Provide crew leadership on GIS project work to set, assemble and commission GIS for projects up to 145kV.
- Actively participate on bid teams to ensure estimates are accurate prior to submitting bids to utilities.
- Manage all equipment on construction sites.
- Procure equipment and specialized tools for labor force to ensure efficient execution of work.
- Lead all efforts related to jobsite safety and employee health on assigned projects.

High Voltage Specialists, LLC

Augusta, GA

### **Supervisor**

March 2012 – March 2019

- Led efforts to manage all aspects of substation construction work for electric utilities in the Southeast.
- Provided expertise in the installation of metal clad gear for industrial customers.
- Executed all below grade foundation scope on projects that included foundation, conduit and grounding work.
- Trained/Mentored crew members on rigging techniques and best practices for substation equipment.
- Zero safety incidents for crew from January 2014 – December 2018. Instill belief in crew that safety is paramount on each and every job.

Rowland Construction, LLC

Hazelhurst, Ga

### **Foreman**

January 2001 – March 2012

- Led efforts to build residential homes.
- Managed multiple subcontractors to execute residential home construction projects on budget and ahead of schedule.
- Knowledgeable of industry construction work practices and efficient and safely executing work while not jeopardizing schedule.
- Performed construction take-offs to estimate and bid new home construction in the competitive market.

Little & Smith, Inc.  
*Insurance*



*Since 1926*

A. D. LITTLE, CPCU  
WILLIAM D. SMITH, SR.  
DAVID F. HUNTER  
JAMES R. ELROD  
WILLIAM D. SMITH, JR.  
DAVID B. BURRUSS  
EUGENE Y. NORTHCUTT  
W. BEN WITCHER, AAI  
MICHAEL J. DILLON  
ODIE E. WILSON

202 CHURCH STREET, N.E.  
MARIETTA, GEORGIA 30060  
PHONE: (770) 428-3308  
FAX: (770) 428-8305

March 2, 2022

To Whom It May Concern

Re: Emerald Electrical Consultants LLC  
Experience Modification Rate Factors

Please accept this letter as confirmation that NCCI has issued the following experience modification rate factors:

2/1/2022	.91
2/1/2021	1.00
2/1/2020	1.00

Please don't hesitate to contact our office with any questions.

Regards,

*Kim C. Massaud*

Kim C. Massaud  
Senior Account Manager



HIGHEST STANDARDS  
OF PROFESSIONAL SERVICE

# OSHA's Form 300A (Rev. 01/2004)

## Summary of Work-Related Injuries and Illnesses

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0

### Injury and Illness Types

Total number of... (M)	(1) Injury	0	(4) Poisoning	0
	(2) Skin Disorder	0	(5) Hearing Loss	0
	(3) Respiratory Condition	0	(6) All Other Illnesses	0

### Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

### Establishment information

Your establishment name Emerald Electrical Consultants, LLC  
 Street 2575 Jason Industrial Pkwy Suite C  
 City Winston State Georgia Zip 30187  
 Industry description (e.g., Manufacture of motor truck trailers)  
Utility Construction  
 Standard Industrial Classification (SIC), if known (e.g., SIC 3715)  
2 3 7 1 3 0  
 OR North American Industrial Classification (NAICS), if known (e.g., 336212)

### Employment information

Annual average number of employees 3  
 Total hours worked by all employees last year 1,560

### Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Jimmy Tevitt Title CEO  
 Company executive  
678-523-0820 Phone 11/8/17 Date

# OSHA's Form 300A (Rev. 01/2004)

## Summary of Work-Related Injuries and Illnesses

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### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
(G) 0	(H) 0	(I) 0	(J) 0

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
(K) 0	(L) 0

### Injury and Illness Types

Total number of... (M)	(1) Injury	(2) Skin Disorder	(3) Respiratory Condition	(4) Poisoning	(5) Hearing Loss	(6) All Other Illnesses
	0	0	0	0	0	0

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Utility Construction  
 Standard Industrial Classification (SIC), if known (e.g., 336212)  
2 3 7 1 3 0  
 OR North American Industrial Classification (NAICS), if known (e.g., 336212)

### Employment information

Annual average number of employees 8  
 Total hours worked by all employees last year 22348.5

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Dinady Teuitch Title President / CEO  
 (company executive)  
423-305-3987 Date 1/29/2020  
478-523-0820

# OSHA's Form 300A (Rev. 01/2004)

## Summary of Work-Related Injuries and Illnesses

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### Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

### Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

### Injury and Illness Types

Total number of... (M)	(1) Injury	(2) Skin Disorder	(3) Respiratory Condition	(4) Poisoning	(5) Hearing Loss	(6) All Other Illnesses
0	0	0	0	0	0	0

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Utility Construction  
 Standard Industrial Classification (SIC), if known (e.g., SIC 3715)  
2 3 7 1 3 0  
 OR North American Industrial Classification (NAICS), if known (e.g., 336212)

### Employment Information

Annual average number of employees 13  
 Total hours worked by all employees last year 34412.75

### Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Judy Tevitt  
 Company executive  
423-305-3987  
 Phone  
CEO  
 Title  
1/30/21  
 Date



All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

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**Number of Cases**

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	0
(G)	(H)	(I)	(J)

**Number of Days**

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(K)	(L)

**Injury and Illness Types**

Total number of... (M)	
(1) Injury	0
(2) Skin Disorder	0
(3) Respiratory Condition	0
(4) Poisoning	0
(5) Hearing Loss	0
(6) All Other Illnesses	0

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**Establishment information**

Your establishment name Emerald Electrical Consultants, LLC

Street 2575 Jason Industrial Pkwy Suite C

City Winston State Georgia Zip 30187

Industry description (e.g., Manufacture of motor truck trailers)  
Utility Construction

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)  
2 3 7 1 3 0

**Employment information**

Annual average number of employees 15

Total hours worked by all employees last year 39504.62

**Sign here**

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Lindy Tevill  
Company executive

President  
Title

423-305-3987  
Phone

3/2/2022  
Date

# GENERAL RULES FOR ALL EMPLOYEES

**PART**

**1**

## **Management Commitment and Expectations**

### **COMPANY SAFETY VALUES**

#### **EEC's Safety Commitment**

EEC is committed to Occupational, Health, and Safety Excellence. Our Safety Vision and Safety Principles define our aspirations and our daily execution of these support our goal and mission of "Nobody Gets Hurt!"

#### **Safety Vision**

To be the safest contractor in the markets we serve and fulfill our goal and daily mission of "Nobody Gets Hurt!"

### **Safety Principles**

- All injuries are preventable. “Nobody Gets Hurt!”
- Management is responsible for preventing injuries.
- All hazards can be controlled.
- Training is essential in the safe execution of work.
- Working safely is a condition of employment.
- We will promote safety both at work and at home.

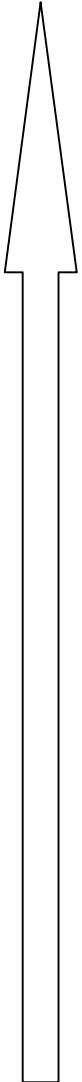
EEC leadership, at every level, is responsible for translating this objective into positive, productive actions.

**Nobody Gets Hurt!**

## Cultural Strength

An organization's cultural strength can be measured by how it's employees act as *individuals and collectively* as a team. A world-class safety culture is primarily in a state of interdependence (teams). Here are the states of cultural strength leading up to World-Class Safety and interdependence.

### Interdependent (Teams) – World-Class Safety

- 
- Safety goals and objectives are a prominent part of the business plan.
  - All standards are aligned with and support the goals, objectives, and plans.
  - Employees feel responsible for their coworkers' safety and act accordingly.
  - Reaching self-sustained safety excellence; safety thinking permeates all aspects of work.
  - Safety is everyone's core value.

### Independent (Self)

- All employees have personal knowledge and commitment to safety.
- Line Management is fully involved in leading, planning and executing the safety program.
- Systems and processes are working well; safety climate and attitudes are excellent.

### Dependent (Supervision)

- Level of management commitment to safety is elevated.
- Working safely is a condition of employment.
- Line management is involved in most aspects of the safety program, but needs help to develop the skills to drive the Safety Management System to excellence.

### Reactive (Natural Instinct)

- Focus is on unsafe conditions and trailing indicators of performance.
- Minimum-adequate performance; may lack some basic systems and processes.
- Compliance with standards is generally high, but needs to help to identify problems, gaps, and ways to improve.
- Management understands its responsibilities in managing and improving safety performance but tends to delegate planning and execution.

Addresses for Publications Reference in the EEC Safety Handbook

**ACGIH®**

1330 Kemper Meadow Drive  
Cincinnati, Ohio 45240, USA  
Customers/Members  
Phone: 513-742-2020

**American Public Works  
Association**

Washington DC Office  
1275 K Street, NW, Suite 750  
Washington, DC 20005  
Phone: (202) 408-9541

**ANSI**

Washington, DC. Headquarters  
1899 L Street, NW, 11th Floor  
Washington, DC, 20036  
Tel: 202.293.8020

**ASTM Headquarters**

100 Barr Harbor Drive  
P.O. Box C700  
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## 1. COMPLIANCE TO SAFETY RULES

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### 1.1. Employee Requirement

- 1.1.1 All employees are required to know and comply with the safety rules which apply to their jobs.
- 1.1.2 The company has numerous safety rules and guidelines that SHALL be followed for specific operations that apply to those engaged in hazardous work areas or operations. These rules are contained in the EEC Safety Handbook, other EEC safety programs, company policies, standard work practices, operating procedures, as well as federal, state, and local regulations. Failure to comply with safety rules and guidelines may result in progressive disciplinary action(s).
- 1.1.3 EEC empowers our employees and subcontractors to make suggestions or identify safety concerns. All safety concerns SHALL be brought to the attention of your immediate supervisor.

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## 2. COMPANY CARDINAL RULES

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### 2.1. Definitions

- 2.1.1 **Cardinal Rules:** EEC rules or OSHA Standards (whichever is more stringent) that when violated place the employee or any other person in an immediate life threatening situation.
- 2.1.2 **Management:** EEC personnel who control, supervise, and make decisions related to the work EEC performs and can include any employee from a crew foreman up to the CEO.

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## **2.2. Discipline**

- 2.2.1** Violation of a Cardinal Rule results in a minimum of an immediate five (5) day suspension and up to termination of employment.

---

## **2.3. Return to Work**

- 2.3.1** An employee who has been terminated for violation of a Cardinal Rule cannot be rehired for 12 months from the date of the termination and must be approved by a company Vice President and the Vice President of Safety.

---

## **2.4. Cardinal Rules**

### **2.4.1 Excavation/Cave-In Protection**

- 2.4.1.1** Competent person must not allow workers to enter an excavation without following any of the required rules and standards for proper sloping, benching, cave-in protection (shoring, shielding), and safe means of egress.

- 2.4.1.2** Workers must not enter the excavation without the competent person's authorization.

- 2.4.2** **Excavation/Locating Underground Utilities** – No underground excavation activities SHALL be done without a proper "One Call" being performed beforehand.

- 2.4.3** **Fall Protection** – 100% fall protection SHALL be used when applicable to work that requires it.

- 2.4.4** **Minimum Approach Distance (MAD)** – The minimum approach distance SHALL be followed by all personnel - (qualified and non-qualified electrical workers).

- 2.4.5** **Rubber Gloves and Rubber Sleeves** – Shall be worn and used when required.

**2.4.6 Grounding**

2.4.6.1 All circuits are to be considered energized and worked as such unless grounded through an effective Equipotential Zone (EPZ) or acceptable method per EEC Procedures 15161278–UG and 15161278–OH.

2.4.6.2 Use of a running ground is required for placement of strand on joint use poles.

**2.4.7 Static Control** – Static hazards SHALL be eliminated during hazardous gas operations.

**2.4.8 Suspended Load** – Suspended loads SHALL not be worked under without management authorization.

**2.4.9 Confined Space**

2.4.9.1 Competent person must not allow workers to enter a confined space without following the required rules and standards for gas monitoring, work permit, harness & retrieval equipment, respiratory protection, ventilation, trained attendant and entry supervisor.

2.4.9.2 Workers must not enter the confined space area without the competent person’s authorization.

---

**3. EMPLOYEE ASSESSMENT/TRAINING**

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**3.1. Skill Assessment**

**3.1.1** Skills assessments should be performed on newly hired employees to ensure adequate knowledge of work tasks and understanding of safe working procedures.

**3.1.2** Those employees found deficient in the necessary skills to perform their job safely SHALL be recognized, retrained, reclassified, or released.

---

### **3.2. Employee Orientation/Training**

- 3.2.1** At the time of hire, all employees SHALL be provided a copy of the EEC Employee Safety Handbook. It is expected that the employee familiarize themselves with the contents as it is intended for their use as a reference guide.
- 3.2.2** At the time of hire, all employees will be required to complete an employee safety orientation.
- 3.2.3** All employees are required to comply with the EEC policies and safe work practices, EEC regional specific policies/procedures, and our customer's procedures/guidelines.
- 3.2.4** When EEC, customer, federal, state, local, or regulatory safety guidelines differ, it is the practice of EEC to follow the more stringent guideline.
- 3.2.5** Each employee SHALL be instructed in the recognition and avoidance of unsafe conditions and the safety rules applicable to the work being performed.
- 3.2.6** All employees are required to attend regularly scheduled safety training as required by EEC.

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## **4. ROLES AND RESPONSIBILITIES**

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### **4.1. Functional Responsibilities**

- 4.1.1** Employees at every level SHALL be held accountable not only for their own safety but also for the safety of those they work around. In order for accountability to be accepted, a clear understanding of roles and responsibilities must be established, communicated, and agreed upon. The following are considered the minimum responsibilities, according to your assigned role, here at EEC.
- 4.1.2** Employee Responsibility/Individual Responsibilities



- 4.1.2.1 It is your responsibility, regardless of title or role, as an employee of EEC to act in a manner that promotes and provides for the safety of yourself, fellow employees, and the general public. In addition to the following responsibilities, you may be required to follow more detailed rules that apply to specific jobs and/or projects. As an employee it is your responsibility to support and implement the EEC Safety Program by fulfilling, at minimum, the following responsibilities:
- a. All employees SHALL be respectful to all coworkers, subcontractors, and the public.
  - b. Know, understand, and comply with EEC safety policies, programs, procedures, and best practices.
  - c. Possess functional and technical knowledge and skills necessary to perform the work safely.
  - d. Apply safe work behaviors/practices and encourage fellow coworkers to work safely.
  - e. Actively observe, report, and/or correct any recognized or potentially hazardous conditions, as well as any unsafe acts being performed.
  - f. Wear the required personal protective equipment (PPE) as prescribed by the company, federal Occupational Safety & Health Administration (OSHA), EEC, and/or the customer.
  - g. Properly maintain and inspect PPE daily or as prescribed by the manufacturer. If PPE is damaged or replacement PPE is required, immediately contact your foreman or supervisor.
  - h. Only operate equipment in good condition with all safety guards in place.
  - i. Report all injuries, regulatory visits, inspections, and any unscheduled or known occurrences, no matter how minor, immediately to a supervisor and/or foreman.
  - j. Attend safety training as required, participate in tailgate meetings and job briefings; contribute ideas and suggestions on how to improve safety procedures and conditions.
  - k. Participate on incident investigation (II) teams when required.

- l. Promote the value in self-reporting; motivate and encourage your coworkers/crew and members/staff to report near misses, and the importance of communicating lessons learned.
- m. Participate in area safety teams (ASTs) as required.
- n. Operate a company vehicle in a safe and courteous manner adhering to EEC driving policies, as well as all federal, state, and local laws. Your ability to drive a company vehicle is a privilege, not a right as an employee.

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#### **4.2. Front Line Supervision (FLS)**

**4.2.1** Applicable Titles: Superintendent, General Foremen, Supervisor, Project Manager (PM), Foremen, Crew Leader, or any Designated Person In Charge.

**4.2.2** FLS must support and implement the EEC Safety Program by fulfilling, at minimum, the following additional responsibilities:

4.2.2.1 Actively demonstrate felt leadership.

4.2.2.2 Take responsibility for and accept ownership of your work crew's safety, and communicated crew member responsibilities.

4.2.2.3 Enforce EEC safety policies, programs, procedures, and best practices.

4.2.2.4 Hold field employees accountable for practicing safety work behaviors, compliance to EEC safety policies/procedures, and/or with any customer safety related requirements, and use coaching and discipline as needed or required.

4.2.2.5 Obtain and distribute PPE to new-hires and issue replacements when required. Maintenance and inspection of the PPE is the responsibility of the employee; however routine verification, discussions, and reminders will be conducted.

- 4.2.2.6 Routinely inspect powered and non-powered tools, mechanized equipment, rigging equipment, personnellifts, etc.
- 4.2.2.7 Perform skills assessment to ensure employee is qualified and able to perform the work assigned in a safe manner.
- 4.2.2.8 Conduct job briefings with crew discussing all pertinent information relevant to the task to be performed prior to the start of the job and document on EEC job briefing sheet.
- 4.2.2.9 Perform safety coaching observations (SCOs) as required.
- 4.2.2.10 Conduct weekly job-site safety meetings.
- 4.2.2.11 Follow safety pre-planning guidelines and recommendations.
- 4.2.2.12 Review completed job briefing sheets for content quality, and provide coaching as necessary.
- 4.2.2.13 Communicate safety concerns/considerations prior to introducing a new process, procedure, machine, or material to the workplace.
- 4.2.2.14 Ensure that adequate first aid supplies are maintained.
- 4.2.2.15 Verify and/or arrange for applicable safety training for your employees prior to the assignment of duties, e.g., EEC's Confined Space Program, trenching and excavation, new employee orientation, etc.
- 4.2.2.16 Consistently enforce, document, and report to management those employees who violate EEC safety policies and/or procedures.

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### **4.3. Safety Personnel Responsibility**

- 4.3.1** Applicable Titles: VP Corporate Safety, Corporate Safety Director, Corporate Safety Manager, Regional Safety Manager, Area Safety Manager, Safety Manager, Safety Specialist, Safety Coordinator, etc.
- 4.3.2** Safety personnel are required to support and implement the EEC Safety Program by fulfilling, at minimum, the following additional responsibilities:

- 4.3.2.1 Actively demonstrate felt leadership.
- 4.3.2.2 Identify, develop, administer, and interpret programs and policies as needed to maintain a safe work place.
- 4.3.2.3 Act as resource for Operations personnel in the organizing and planning of safe work activities and conditions.
- 4.3.2.4 Facilitate training as needed to reinforce safe work procedures/processes.
- 4.3.2.5 Identify potential safety and health hazards and develop solutions. Plan and conduct evaluations of potentially hazardous conditions. Advise employees and management on safe practices and potential hazards.
- 4.3.2.6 Communicate with federal, state, and local safety, health, and environment agencies as a department representative concerning compliance and emerging standards.
- 4.3.2.7 Perform work site audits (WSAs) as required to identify safe and at-risk conditions and/or work practices.
- 4.3.2.8 Coordinate with regional operations personnel establishing training programs for recognized hazards.
- 4.3.2.9 Be knowledgeable in applicable American National Standards Institute (ANSI), Environmental Protection Agency (EPA), OSHA Standards, 29 CFR 1910, 29 CFR 1926, and other applicable standards.
- 4.3.2.10 Attend periodic personal development safety training.

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**4.4. Area/OUID Managers**

- 4.4.1 Applicable Titles: Area Manager, OUID Manager, Program Management, Corporate OUID Manager
- 4.4.2 Area/OUID management must support and implement the EEC Safety Program by fulfilling the following additional responsibilities:
  - 4.4.2.1 Actively demonstrate felt leadership.
  - 4.4.2.2 Take responsibility for and accept ownership of safety for your respective area.

- 4.4.2.3 Enforce EEC safety policies, programs, procedures, and best practices.
- 4.4.2.4 Hold FLS accountable for implementation and consistent application of all safety policies, procedures, and applicable best practices.
- 4.4.2.5 Ensure required OSHA or EEC safety training and/or refresher training is provided to supervisors, foremen, and employees prior to the assignment of duties or as required.
- 4.4.2.6 Ensure that pre-planning safety guidelines are followed.
- 4.4.2.7 Perform SCOs as required.
- 4.4.2.8 Review all incidents in your area with FLS.
- 4.4.2.9 Review the results of all incident investigations within your respective area to ensure proper reports are completed and appropriate actions are taken to prevent recurrence.
- 4.4.2.10 Consistently and fairly implement and administer the appropriate company/regional disciplinary procedures for those employees who violate safety rules.

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#### **4.5. LOB and Business Department Management**

- 4.5.1 Applicable Titles: Regional Controller, Regional Department Managers, Corporate Department Managers
- 4.5.2 LOB and business department management are responsible for all safety and incident prevention activities within their respective LOB/department and will be held accountable as the motivating force to ensure successful implementation for all such safety activities. LOB and business department management will support and implement the EEC Safety Program by fulfilling the following additional responsibilities:
  - 4.5.2.1 Actively demonstrate felt leadership.
  - 4.5.2.2 Take responsibility for and accept ownership of safety for your respective LOB/department.
  - 4.5.2.3 Ensure enforcement of EEC safety policies, programs, procedures, and best practices.

- 4.5.2.4 Hold area/OUID management accountable for implementation and consistent application of all EEC safety policies, programs, procedures, and best practices.
- 4.5.2.5 Ensure consistent, fair, implementation and administration of the appropriate company/regional disciplinary procedures for those employees who violate safety rules.
- 4.5.2.6 Review the results/recommendations of all incident investigations follow-up with OUID/area management to verify action plan for future recurrence.

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**4.6. Operations Executive Management**

- 4.6.1 Applicable Titles: Regional Vice President (RVP), Operations Vice President (OVP), Vice President (VP), Division Manager
- 4.6.2 Operations executive management is responsible for all safety and incident prevention activities within their respective region/division and will be held accountable as the motivating force to ensure successful implementation for all such safety activities. Operations executive management will support and implement the EEC Safety Program by fulfilling the following additional responsibilities:
  - 4.6.2.1 Actively demonstrate felt leadership.
  - 4.6.2.2 Take responsibility for and accept ownership of safety for your respective region/division.
  - 4.6.2.3 Hold LOB and business department management accountable for compliance, implementation, and consistent application of all safety policies and procedures.
  - 4.6.2.4 Ensure consistent and fair implementation and administration of appropriate company/regional disciplinary procedures for those employees who violate safety rules.
  - 4.6.2.5 Provide necessary administrative services to LOB and business department management.

## **4.7. Executive Management**

- 4.7.1** Applicable Titles: Chief Executive Officer (CEO), Chief Operating Officer (COO), Chief Financial Officer (CFO), and Council
- 4.7.2** The success of our safety program depends crucially upon active interest and participation by executive management. Executive management plans, organizes, and administers the safety and health program by establishing policy, setting goals and objectives, assigning responsibility, motivating employees, and monitoring program results.
- 4.7.3** Executive management support and implement the safety program by fulfilling the following additional responsibilities:
  - 4.7.3.1** Actively demonstrate felt leadership.
  - 4.7.3.2** Accountable for the effective company-wide implementation of the EEC Safety Program and responsible for the consequences.
  - 4.7.3.3** Hold Operations executive management accountable for implementation and consistent application of all safety policies and procedures.
  - 4.7.3.4** Review Operations executive management performance in achieving annual safety goals and objectives.
  - 4.7.3.5** Consistently uphold the company Safety Vision, Commitment and Principles.
  - 4.7.3.6** Support the EEC Safety Program financially.
  - 4.7.3.7** Establish annual company-wide safety goals.
  - 4.7.3.8** Provide direction to all management levels.
  - 4.7.3.9** To encourage active employee involvement in EEC Safety Program by establishing a system to ensure the protection of all employees for reporting safety hazards, establish effective recognition systems, and defining disciplinary procedures to address safety program violations.

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**5. EEC DISCIPLINARY GUIDELINES**

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**5.1. Disciplinary Action Assessment**

**5.1.1** Disciplinary action will follow all violations of safety rules, procedures, and/or safe work practices.

**5.1.2** The severity of the violation will determine the action to be taken.

**5.1.3** All employees are required to be acquainted with, understand, and comply with the safety rules that apply to their jobs.

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**5.2. Summary of Disciplinary Guidelines**

**5.2.1** It is the practice of EEC that any employee who violates any of the company's safety rules and regulations may be subject to the following disciplinary actions.

**5.2.1.1** Verbal warning (first time/non-serious)

**5.2.1.2** Written warning/retraining (multiple/non-serious/serious)

**5.2.1.3** Suspension without pay (multiple/serious)

**5.2.1.4** Termination (multiple/serious/threatening to life)

*Note: Where disciplinary action is deemed appropriate, it SHALL be conducted in a timely manner.*

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**5.2.2** The guidelines listed in Table 2, Disciplinary Action Guidelines, meet the minimum corporate requirements. The disciplinary guidelines may be modified to address specific contract and/or regional requirements, but may not be less stringent. The more stringent disciplinary guidelines SHALL apply at all times.

**5.2.3** Supervisors and foremen will also be held accountable for the unsafe acts of their employees.



- 5.2.4**            Established EEC written warning forms will be used to document disciplinary actions.
- 5.2.5**            Any employee conduct that violates a company policy, or interferes with or adversely affects EEC business, is sufficient grounds for disciplinary action. This action can range from verbal warnings to immediate discharge. However, progressive discipline is not a fixed employee right. Depending on the conduct, it is EEC’s general policy to take disciplinary steps in the following order; however, EEC has the option to dispense with progressive discipline when appropriate.
- 5.2.6**            To decide on the appropriate action, EEC will consider the seriousness of the conduct, employment record, the ability to correct the conduct, actions the company has taken for similar conduct by other employees, how the action affects customers, and other circumstances.
- 5.2.7**            EEC reserves the right to terminate your employment at any time, for any lawful reason. The provisions of these practices and guidelines will apply except where they conflict with state law or collective bargaining agreement provisions.

*Table 2: Disciplinary Action Guidelines*

<b>Action</b>	<b>Type</b>	<b>Examples</b>
1. Verbal Warning	Non-Serious	<ol style="list-style-type: none"> <li>1. First time offense of non-life-threatening processes.</li> <li>2. Failure to wear PPE.</li> <li>3. Poor housekeeping.</li> </ol>
2. Written Reprimand and Retraining	Repeat Non-Serious or Serious	<ul style="list-style-type: none"> <li>• Repeat violation of non-serious</li> </ul> <p><i>Other examples may include but are not limited to:</i></p> <ol style="list-style-type: none"> <li>1. Knowingly endangering oneself or others by not following a safety work rule.</li> <li>2. Failure to set up job site property with signs, barricades, cones, etc.</li> <li>3. Failure to complete and display the confined space entry permit.</li> <li>4. Failure to complete daily inspections of electrical protective equipment.</li> <li>5. Failure to properly maintain or wear respirators when required.</li> <li>6. Failure to have fire extinguishers on the site.</li> <li>7. Failure to place a ladder in the trench where required.</li> <li>8. Misuse of chains, slings, ropes, and winch lines.</li> <li>9. Failure to maintain a company vehicle in proper operating condition.</li> <li>10. Violation of company Policy 140 - Use of Mobile Electronic Devices while Driving or Operating Equipment.</li> <li>11. Failure to use safety belts in vehicles/equipment.</li> </ol>
3. Suspension Without Pay	Serious	Third violation of non-serious or repeat violation of those listed in No. 2 above.
4. Termination	Serious or Life-Threatening	<p><b>ANY VIOLATIONS OF CARDINAL RULES</b></p> <ul style="list-style-type: none"> <li>• Repeat violation of a serious offense.</li> <li>• Endangering the life of co-workers, the public, or oneself.</li> <li>• Habitually ignoring established safe work practices.</li> </ul> <p><i>Other examples may include but are not limited to:</i></p> <ol style="list-style-type: none"> <li>1. Failure to properly protect employees while in an excavation.</li> <li>2. Failure to test and document excavation conditions before entry.</li> <li>3. Failure to test the atmosphere of a confined space or wear appropriate PPE.</li> <li>4. Failure to use or wear electrical protective equipment.</li> <li>5. Use, possession, distribution, or under the influence of alcohol or illicit substances while on company property, or while operating a company vehicle. Refer to EEC Policy 112 and EEC Policy 107 for more information.</li> <li>6. Unsafe operation of a company vehicle.</li> <li>7. Insubordination</li> <li>8. Employee conduct – Refer to Part 1, 5.2.5.</li> </ol>

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## **6. EEC STRAIN/SPRAIN INCIDENT REDUCTION PROGRAM**

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### **6.1. BLINK**

**6.1.1** BLINK is defined as a reflex action involving involuntary movement to combat fatigue, and to keep your eyes comfortable. In a similar manner, your muscles need to “Blink.”

6.1.1.1 A “B L I N K ” for your shoulders

6.1.1.2 A “B L I N K ” for your back

6.1.1.3 A “B L I N K ” for your legs

6.1.1.4 A “B L I N K ” for your neck

**6.1.2** Before Stretching – Remember . . .

6.1.2.1 Be sure to warm-up first

6.1.2.2 Don’t bounce

6.1.2.3 Breathing throughout stretching routine

6.1.2.4 Avoid pain – Stretching should not hurt

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### **6.2. BLINK Principles of Stretching**

**6.2.1** Let Your Body Know What’s Coming - Perform simple bending, twisting and stretches that are designed to prepare the body for the work it’s about to do.

**6.2.2** Let Your Body Breathe - By performing simple bending, twisting and stretches you’re getting Oxygen to your muscles so they can breathe

**6.2.3** Rule of Opposites - When working forward, make sure you stretch backward.

**6.2.4** If you wait too long to “blink” the cost is fatigue and discomfort; potentially injury.

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### **6.3. Lifting Principles**

**6.3.1** Application of easy to understand lifting principles into normal activities performed both on and off the job.

6.3.1.1 Keep it close and keep the curves

- a. The farther a load is from your body, the heavier it is on your back.
- b. The farther you reach, the farther your back moves from the “power position,” and as a result, the weaker your back gets.
- c. Get as close to an object as possible before you pick it up.

6.3.1.2 Build a bridge - When bending forward to pick something up, if you do not feel weight on a forward arm, or a forward leg, the additional load is being placed on your back.

6.3.1.3 Feet first - Don’t let your upper body go anywhere that your feet don’t go first.

*Refer to the EEC Back Owner’s Guide to Lifting and Stretching and the Material Handling section of this handbook for more information.*

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## **7. PERSONAL PROTECTIVE EQUIPMENT**

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### **7.1. General**

**7.1.1** All employees and visitors are required to wear basic PPE in any designated work place/work zone. Basic PPE requires the use of approved hard hat, safety glasses, gloves, protective footwear, and high-visibility garment (traffic vest).

7.1.1.1 Approved PPE must meet or exceed the following design specifications:

7.1.1.2 Company-provided Class E hard hat that meets ANSI Z89.1-2009 Standard (or later) specifications, or equivalent.

- 7.1.1.3 Company-provided eye protection (with fixed side shields) that meets the current ANSI Z87.1-2010 Standard specifications, or equivalent, SHALL be worn by employees and visitors at all outdoor job sites locations.
- 7.1.1.4 Company-provided cut-resistant gloves that meet ANSI Level 2 and/or EN Level 3 or greater specifications, or equivalent.
- 7.1.1.5 Sturdy protective safety footwear; customer-specified protective footwear; or when required protective (safety) toe cap footwear meeting ASTM F2413 specifications.
- 7.1.1.6 Company-provided high visibility garment (traffic vest, shirt, or equivalent) meeting ANSI ISEA 107 (Class 2 or greater) specifications.
- 7.1.1.7 Established procedures and guidelines for the use, inspection, and maintenance of PPE are set forth below.

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## **7.2. Employee**

- 7.2.1 Each employee, at minimum, SHALL wear basic PPE.
- 7.2.2 Each employee SHALL be knowledgeable of the hazards and PPE required for the task at-hand.
- 7.2.3 Each employee SHALL inspect their PPE immediately prior to use.
- 7.2.4 If PPE is damaged employee SHALL notify the supervisor at once so replacement PPE can be obtained.
- 7.2.5 Each employee SHALL be responsible for proper storage of the equipment after its use as outlined in this safety handbook.
- 7.2.6 All non-company owned and/or issued PPE SHALL be approved for use by the supervisor prior to the start of any work.

*Refer to the EEC Personal Protective Equipment Program for more information.*

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**7.3. Person in Charge/Foreman/Supervisor**

- 7.3.1** The designation of the work place/work zone is the responsibility of management.
- 7.3.2** The job briefing SHALL be used as a hazard assessment or reference to identify additional and/or specialized PPE for the task at-hand.
- 7.3.3** If the basic PPE is not to be worn, it must be approved by supervision and documented on the job briefing.
- 7.3.4** It is the responsibility of the supervisor to verify that all crew members are wearing the basic PPE for the task at-hand.
- 7.3.5** It SHALL be the responsibility of the supervisor to verify all PPE is used in the proper manner.
- 7.3.6** It SHALL be the responsibility of the supervisor to replace all damaged or obsolete PPE.

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**7.4. Clothing and Jewelry**

- 7.4.1** Clothing is the first line of protection on a construction site. The guidelines below are for the general safety of all employees on a construction site.
  - 7.4.1.1** Employees engaged in office and outside work SHALL wear clothing suitable to weather conditions and for the job being performed.
  - 7.4.1.2** Clothing attire SHALL be good condition and appropriate for a construction site, i.e., long pants that reach the ankles and shirts with sleeves at least four (4) inches in length. Open weave/mesh shirts, sleeveless shirts, sleeves rolled up onto the top of the shoulder, and other such apparel or practices are prohibited.
  - 7.4.1.3** Employees SHALL wear long sleeve 100% cotton shirts when contacting treated wood products or herbicides, when flame resistant clothing is not required.

- 7.4.1.4 Clothing SHALL be 100% cotton and/or other natural fiber. Clothing made from acetate, nylon, polyester, and rayon is prohibited when working in an area where there is the potential for flame or electric arcs.
- 7.4.1.5 Body jewelry and other like items are prohibited when the work performed requires the use of tools or equipment such as ropes, cables, hooks, etc., which could result in a catch or impale hazard.
- 7.4.1.6 When work is performed within reaching distance of exposed energized parts or equipment, employees SHALL NOT wear rings, swinging watches, key chains, or any other conductive article or clothing that would increase the hazards associated with contact with energized lines or apparatus.
- 7.4.1.7 When working on or around energized lines or apparatus where a potential thermal or electrical burn hazard exists, employees SHALL wear approved fire resistant (FR) pants with long sleeved FR shirt, FR coveralls, or FR switching jackets based on current ASTM Standards for FR apparel.

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**7.5. Footwear**

- 7.5.1 Employees engaged in office and outside work SHALL wear footwear suitable to weather conditions and for the job being performed.
- 7.5.2 Approved footwear for outside and yard operations is defined as sturdy leather footwear with ankle and arch support, as well as thick soles.
- 7.5.3 Protective (safety) toe cap footwear, when required, SHALL meet ASTM F2413-11 or current revision.

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**7.6. High Visibility Apparel**

- 7.6.1 EEC requires high visibility garment(s) (traffic vest, shirt, or equivalent) meeting ANSI/ISEA 107-2010 Class 2 (or greater) for all employees.

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**7.7. Eye Protection**

- 7.7.1** Eye protection with fixed side shields meeting ANSI Z87.1-2010 Standard SHALL be worn by employees and visitors at all outdoor job sites locations.
- 7.7.2** Employees whose work exposes them to such conditions may wear contact lenses for optical correction as long as approved eye protection is also worn. Exception, contact lenses should not be worn if chemical splash hazards are present.
- 7.7.3** Over the glass (OTG) or safety glasses made to fit over non-safety prescription eye glasses SHALL be made available by the company when necessary.

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**7.8. Face Protection**

- 7.8.1** Based on the task at-hand the selection of suitable face protection SHALL be determined, documented on the job brief, issued, and utilized prior to the start of work. For example, common operations that require a face shield in addition to eye protection are:
  - 7.8.1.1** Opening or closing of energized fused disconnects, i.e., lateral fuses and capacitor bank
  - 7.8.1.2** Acetylene welding or cutting
  - 7.8.1.3** Electric welding
  - 7.8.1.4** CAD welding
  - 7.8.1.5** Chipping, grinding, buffing, impact drilling, cutting or breaking masonry, chipping brush, or operating hydraulic presses
  - 7.8.1.6** Handling or using acids or caustics
  - 7.8.1.7** Cleaning with compressed air
  - 7.8.1.8** Installing or removing electric meters



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**7.9. Head Protection**

- 7.9.1** Class E hard hats meeting ANSI Z89.1-2009 (or later) high voltage specifications as to dielectric strength and resistance to impact, SHALL be worn by all employees and visitors at all outdoor job site locations.
- 7.9.2** Hard hat components should be inspected daily for signs of dents, cracks, penetration, and any damage due to impact, rough treatment, or wear.
- 7.9.3** The maintenance, care, and replacement schedule prescribed by the manufacturer should be followed. Typical replacement schedules are five years on the shell, and two year on the suspension, with normal wear.
- 7.9.4** Hard hats SHALL be worn as prescribed by the manufacturer. No unapproved attachments or other head gear SHALL be worn under the hard hat.
- 7.9.5** Chin strap holding device should be worn when needed or when specified.

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**7.10. Hand Protection**

- 7.10.1** Company provided cut-resistant gloves meeting ANSI Level 2 and/or EN Level 3 or greater SHALL be worn by all employees performing manual material handling activities.
- 7.10.2** Leather gloves used for outer protection of rubber gloves SHALL never be used as working gloves.

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**7.11. Hearing Protection**

- 7.11.1** The following points are to be used as guidelines when performing work, employees SHALL be familiar with EEC Hearing Conservation Program.
- 7.11.2** Approved hearing protection SHALL be worn when employees are working in an area or with equipment that is designated as requiring protection.

- 7.11.3** Hearing protection SHALL be worn while operating certain equipment and as directed by the supervisor. Examples include, but are not limited to:
  - 7.11.3.1 Jackhammers
  - 7.11.3.2 Compactors
  - 7.11.3.3 Air chisels
  - 7.11.3.4 Wood chippers
  - 7.11.3.5 Abrasive blasting (sand blasting)
- 7.11.4** Employees who work in positions where their exposures exceed OSHA's recommended time weighted average (TWA) SHALL participate in regular audiometric evaluations.
- 7.11.5** Approved hearing protection SHALL be made available as required.
- 7.11.6** Employees required to wear hearing protection SHALL comply with the proper use, limitation, and care of the protectors worn.
- 7.11.7** Sound level assessments SHALL be performed as hazard assessments require and results SHALL be posted for employee review.

Table 3: Permissible Noise Exposures

<b>Duration</b>	<b>Per Day (hours)</b>
<b>Sound Level</b>	<b>(dBA)*</b>
8	90
6	92
4	95
3	97
2	100
1-½	102
1	105
½	110
¼ or less	115

*\*Employees SHALL wear proper protection devices when exposed at or above these levels.*

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**7.12. Respiratory Protection**

**7.12.1** When a situation arises promoting the need for respiratory protection, consideration should be given to the five factors listed below in the selection of respirators:

- 7.12.1.1 Type and concentration of hazard
- 7.12.1.2 Duration of exposure
- 7.12.1.3 Work requirements and conditions
- 7.12.1.4 Limitations of the respirator
- 7.12.1.5 Medical factors

**7.12.2** Where possible, the need for respiratory equipment should be eliminated by engineering controls or adequate ventilation.

**7.12.3** Only those employees who have been medically evaluated, fit tested, and trained SHALL be considered qualified to wear approved respirators.

**7.12.4** Respirators of appropriate type SHALL be selected and worn according to the specific work being performed, e.g., abrasive blasting.

- 7.12.5** All respiratory equipment SHALL be properly worn, stored, and maintained according to manufacturer’s guidelines.

*Refer to EEC Respirator Program located on HMCentral for more information.*

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**7.13. Working Over or Near Water**

- 7.13.1** Where the danger of drowning exists, all employees SHALL be provided with and SHALL use U.S. Coast Guard approved personal flotation devices for work performed.

- 7.13.1.1 Prior to and after each use, the buoyant work vests or life preservers SHALL be inspected for defects which would alter their strength or buoyancy. Defective units SHALL NOT be used.

- 7.13.1.2 At least one lifesaving skiff SHALL be immediately available at locations where employees are working over or adjacent to water.

*Refer to OSHA Standard 1926.106, Working Over or Near Water for more information.*

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**8. JOB BRIEFINGS, JOB HAZARD ANALYSIS, SAFETY MEETINGS**

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**8.1. Job Briefings**

- 8.1.1** All crew members SHALL participate in a documented job briefing. Job briefings are to be held at the start of the work shift, as work tasks or hazards differ from original briefing, and as additional personnel arrive at the job site. These job briefings SHALL include the components of a hazard analysis, document job sequence, hazards to be encountered, and steps taken to control/eliminate hazards by doing the following:

- 8.1.1.1 Job location (for emergency response personnel) and description (may need the nearest address).

- 8.1.1.2 Applicable work procedures.
- 8.1.1.3 Hazards associated with the job.
- 8.1.1.4 Safety precautions
  - a. Safe work procedure
  - b. Minimum approach distances
  - c. Personal protective equipment required
  - d. Energy source controls, such as equipment and worker lock-out cards, grounds, open switches, closed valves, etc.
  - e. An escape plan
  - f. Safety precautions for public safety, including work area protection
  - g. Key responsibilities of each member of the working team
    - Identification of any human error traps (error precursors)
    - Applicability of lockout/tagout provisions
- 8.1.2** All job briefings SHALL be documented on the EEC Job Briefing Sheet, Form SAFE-209-2425 (current revision).

*Table 4: Job Briefing Definitions*

<p><b>Job Briefing</b></p>	<p>A documented conversation about job safety, job scope, and specific plans to identify, prevent and respond to potential personnel injury, equipment, facility damage, and other conditions adverse to job quality and success.</p>
<p><b>Front Line Supervisor (FLS)/General Foremen</b></p>	<p>The person who is responsible for multiple work crews/teams in the field and typically has foreman, crew leaders, or individuals who would be working alone that report directly to FLS. This position may be one of the following: general foremen, project manager, superintendent, area manager, supervisor, or any other as indicated by the LOB.</p>
<p><b>Person in Charge (PIC)/Supervisor</b></p>	<p>Person that has been designated responsible for general oversight of working crew and the successful completion of an assigned job.</p>
<p><b>Working Team (Crew)</b></p>	<p>All persons (including contractors) participating in and responsible for the successful completion of an assigned job. Typically, the working team is a one-person or multi-person crew, but may be personnel from multiple groups or organizations who are performing different tasks of a single job assignment.</p>

**8.1.3** Procedure

- 8.1.3.1 Prior to the start of the job, the FLS/GF, or specifically designated duty foreman, SHALL use three-way communication to review with the supervisor all pertinent information on the task(s) to be performed.
- 8.1.3.2 Supervisor SHALL conduct a job briefing with the working team (crew), as well as complete a new job briefing sheet, prior to the start of each job.

- 8.1.3.3 All members of the working team are required to pay attention to the supervisor while a job briefing is in progress. Employees SHALL respond to the supervisor using three-way communication to confirm their understanding of the briefing, including the hazards, individual responsibilities, and steps necessary for safe and effective job task execution.
- 8.1.3.4 After receiving the briefing, the working team (crew) members SHALL sign onto the job briefing sheet to indicate that each person understands the job briefing.
- 8.1.3.5 If an employee does not understand the job briefing, he or she must ask the supervisor for clarification at this point. Use three-way communication to clarify the briefing information.
- 8.1.3.6 Any member of the working team may request to be re-briefed, if at any time they become unsure of their job task. Use three-way communication to clarify the job briefing information.
- 8.1.3.7 Any authorized visitor(s) entering a work area or job site SHALL seek out the supervisor to receive a job briefing and to discuss the nature of their business at the job site.
- 8.1.3.8 The supervisor SHALL stop the job and contact the FLS/GF, or specifically designated duty foreman, if the work cannot be performed in accordance with the EEC Employee Safety Handbook, applicable EEC procedures, and/or customer procedures/guidelines.
- 8.1.3.9 If conditions within the work area change significantly, or if the scope of work changes, the supervisor SHALL conduct a new job briefing with all individuals within a work area. This requirement applies for the working team and for job site visitors who have signed onto the job briefing sheet.
- 8.1.3.10 The FLS/GF SHALL review, within five business days of job completion, all job briefing sheets. FLS/GF SHALL provide coaching to employees, as needed, to sustain or improve the quality of job briefings.
- 8.1.3.11 All job briefing sheets SHALL be retained for a minimum of six months following completion of the job.

*Refer to EEC Job Briefing Procedures located on HMCentral for more information.*

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## **8.2. Job Hazard Analysis (JHA)**

**8.2.1** JHAs are required as part of the job planning process, and should be conducted with care by a knowledgeable supervisor, along with employees responsible for each selected job.

**8.2.2** JHAs consist of examining each task within the project in order to identify and correct existing and potential hazards involved. There are three essential steps involved in setting up a successful job safety analysis:

8.2.2.1 Breaking each selected job down into steps;

8.2.2.2 Identifying the hazards associated with each step, and;

8.2.2.3 Eliminating the hazards.

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## **8.3. Weekly Safety Meetings**

**8.3.1** Weekly safety meetings will be conducted for all employees either in the office or on the job site.

**8.3.2** Weekly safety meeting topics, at a minimum, should include applicable rules of this handbook, lessons learned, and near misses. Length SHALL be 10-15 minutes.

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## **9. WEATHER-RELATED PRECAUTIONS**

**9.1.1** Thunderstorms or lightning in the vicinity, high winds, snowstorms, and ice storms are examples of adverse weather conditions that are presumed to make work too hazardous to perform safely.

**9.1.2** When practical, work should be suspended during adverse weather. Each supervisor must determine the hazards, and then determine when it is safe for work to resume.



## **9.2. Lightning or Thunder**

**9.2.1** Summer is the peak season for one of the deadliest weather phenomena—lightning. Hundreds of people are permanently injured or killed each year. Non-fatal lightning strikes leave people suffering from a variety of long-term, debilitating symptoms such as memory loss, attention deficits, sleep disorders, chronic pain, numbness, dizziness, joint stiffness, irritability, fatigue, weakness, muscle spasms, depression, and more.

9.2.1.1 Lightning is attracted to tall things, metal, water, or a person standing on open ground or a roof.

9.2.1.2 Your work site should have a plan for what to do in a thunder storm.

9.2.1.3 If you count 30 seconds or less between lightning and the thunder, act right away. If the thunder gets louder or you see the lightning more often, the storm is getting closer.

**9.2.2** If a storm is near **DO NOT**:

9.2.2.1 Be the tallest object in an area;

9.2.2.2 Stand out in the open;

9.2.2.3 Stand under a tree (if the tree is hit, you can be too);

9.2.2.4 Stand in a gazebo or open shelter, like a baseball dugout or bus shelter;

9.2.2.5 Stand next to metal objects such as pipes, light poles, door frames, metal fences, or communication towers – indoors or out;

9.2.2.6 Be in or near water – showers, baths, ponds, or running water – indoors or out;

9.2.2.7 Use plug-in power tools or machines – indoors or out;

9.2.2.8 Use a plug-in telephone or a computer with a router/modem – indoors or out.

**9.2.3** If a storm is near **DO**:

9.2.3.1 Employees should seek safe shelter when lightning or thunder is in the area, which includes an enclosed building, like a house, shopping center, school, or office building.

- 9.2.3.2 “Cab up” until the threat has passed. Get into a car, van, truck, or bus with the windows tightly closed. Do not touch the doors or other metal inside the car (open cabs on heavy equipment will not protect you; a convertible with the top up will not protect you; rubber tires will not protect you).
- 9.2.3.3 Squat down with your feet together allowing only your feet to touch the ground if you are in the open with nowhere to go. (That way, you are so low the lightning may hit something else. Also, by not touching much of the ground, you have less chance that the lightning will move across.) Put your hands over your ears to protect against noise. Rule of thumb; wait half an hour after the lightning and thunder stop before going back to work outdoors.
- 9.2.3.4 If a coworker is struck by lightning, call emergency services (911). A victim does not stay electrified; you can touch them right away. If the victim is in the open, if possible move them to a shelter. If the victim has no pulse, if qualified give cardiopulmonary resuscitation (CPR) if possible.

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### 9.3. Hot Weather

#### 9.3.1 Definitions

- 9.3.1.1 “**Acclimatization**” means temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work, for at least two hours per day, in the heat.
- 9.3.1.2 “**Heat illness**” means a serious medical condition resulting from the body's inability to cope with a particular heat load, and includes heat rash, heat cramps, fainting (heat syncope, heat exhaustion, and heatstroke).

- 9.3.1.3 “**Environmental risk factors for heat illness**” means working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing, and personal protective equipment worn by employees.
- 9.3.1.4 “**Personal risk factors for heat illness**” means factors such as an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention, or other physiological responses to heat.
- 9.3.1.5 “**Shade**” means blockage of direct sunlight with either an opening to the direct air or provided with ventilation or cooling available to at least 25% of the affected workers. Pop-up/ assembled canopy, umbrellas, shade tree(s), vehicles, or other devices may be used as shade.

*Note: If it is determined to be unsafe to have a shade structure, or otherwise to have shade present on a continuous basis, an alternative method may be used providing equivalent protection.*

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**9.3.2** Heat Illness Precautions - General

- 9.3.2.1 Supervision SHALL ensure employees are treated for heat related illnesses, monitor weather reports/advisories, and respond accordingly or as directed.
- 9.3.2.2 Drinking water safe for human consumption SHALL be made available to all employees.
- 9.3.2.3 Shade SHALL be provided.
- a. Shade means blockage of direct sunlight with either an opening to the direct air or provided with ventilation or cooling available to at least 25% of the affected workers. Pop-up/assembled canopy, shade tree(s), vehicles, or other devices may be used as shade.

- b. If it is determined to be unsafe to have a shade structure, or otherwise to have shade present on a continuous basis, an alternative method may be used providing equivalent protection.
- 9.3.2.4 Work breaks SHALL be more frequent and encouraged when conditions are present that can contribute to heat illness.
- 9.3.2.5 Training - Employees exposed to heat illness SHALL be aware of:
- a. The environmental and personal risk factors for heat illness, as well as the added burden of heat load on the body caused by exertion, clothing, and personal protective equipment.
  - b. The importance of frequent consumption of small quantities of water, up to four cups per hour, when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties.
  - c. The importance of acclimatization.
  - d. The different types of heat illness and the common signs and symptoms of heat illness.
  - e. The importance to employees of immediately reporting to the employer, directly or through the employee's supervisor, symptoms or signs of heat illness in themselves, or in co-workers.
  - f. The employer's procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary.
  - g. The employer's procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider.
  - h. The employer's procedures for ensuring that, in the event of an emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders. These procedures SHALL include designating a person to be available to ensure that emergency procedures are invoked when appropriate.

**9.3.3** Heat Illness Precautions – Specific

9.3.3.1 Temperatures between 85 and 95 degrees Fahrenheit:

- a. General precautions SHALL be followed.
- b. Shade SHALL be made available.

9.3.3.2 Temperatures above 95 degrees Fahrenheit:

- a. General precautions SHALL be followed.
- b. Shade SHALL be made available.
- c. Effective communication by voice, observation, or electronic means SHALL be maintained so that employees at the work site can contact a supervisor when necessary.
- d. Observing employees SHALL be done to check for alertness and signs or symptoms of heat illness.
- e. Remind employees throughout the work shift to drink plenty of water.
- f. Close supervision of a new employee by a supervisor or designee for the first 14 days of the employee's employment by the employer, unless the employee indicates at the time of hire that he or she has been doing similar outdoor work for at least 10 of the past 30 days for four or more hours per day.

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**9.4. Heat Related Emergencies**

**9.4.1 Heat stroke** develops when the body's systems are overwhelmed by heat and have stopped functioning. It is a life-threatening condition and requires immediate care.

9.4.1.1 Symptoms: Headache, dizziness, nausea, and vomiting sometimes precede actual collapse. If at these signs the victim is withdrawn to a cooler location, the following more severe symptoms may never appear.

- a. Change in level of consciousness.
- b. High body temperature.
- c. Red, hot skin that can be either dry or moist.
- d. Rapid or weak pulse.
- e. Rapid or shallow breathing.

9.4.1.2 Treatment:

- a. Call 911.

- b. Move the injured person to a cool, shady place.
- c. Elevate the head and shoulders slightly.
- d. Fan the victim.
- e. Get the victim into circulating air while applying water with a cloth or sponge.
- f. Under no circumstances should a stimulant be given, only small amounts of cool water, if conscious.
- g. Give care until EMS arrives.

**9.4.2 Heat exhaustion** is an early indication that the body's cooling system is becoming overwhelmed.

9.4.2.1 Symptoms: Headache, dizziness, nausea, and vomiting sometimes precede actual collapse. Cool, moist, pale, flushed, or ashen skin. Other symptoms may include:

- a. Pale face, cool, clammy skin, usually with perspiration around nose, mouth, and forehead.
- b. Rapid and weak pulse.
- c. Temperature about normal.
- d. Muscular weakness, sometimes producing cramps in the legs, arms, or abdomen.
- e. Breathing is shallow.

9.4.2.2 Treatment:

- a. Remove injured person to circulating air while applying water with cloth or sponge.
- b. Keep injured person lying down, elevate feet. If conscious, give small amounts of cool water to drink.
- c. If the victim vomits, do not give any more fluids.
- d. Obtain medical attention if you suspect heat stroke.

**9.4.3 Heat cramps** are painful muscle spasms that usually occur in the legs and abdomen. Heat cramps are the least severe of the heat related emergencies.

9.4.3.1 Symptoms: painful muscle spasms, usually in the legs.

9.4.3.2 Treatment:

- a. Have the victim move to a cool place.
- b. Give cool water to drink.
- c. Have person lightly stretch the muscle and gently massage the area.

## 9.5. Cold Weather Hazards

**9.5.1 Frostbite** is the freezing of body tissue that has been exposed to the cold.

9.5.1.1 Symptoms:

- a. Skin feels intensely cold and numb.
- b. Skin is pale and glossy and white or grayish-yellow in appearance.
- c. Severe frostbite may include blisters and blue skin.
- d. As time passes:
  - Mental confusion, victim staggers.
  - Eyesight fails.
  - May become unconscious.
  - Shock develops.
  - Breathing may cease.

9.5.1.2 Treatment:

- a. Remove wet clothing from affected area.
- b. Soak the frostbitten area in warm water.
- c. Cover with dry, sterile dressing - do not rub anything on the area or rub the affected part.
- d. Check airway, breathing, and circulation and care for shock.
- e. Do not re-warm a frostbitten part if there is a danger of it refreezing.
- f. Transport to receive medical attention.

**9.5.2 Hypothermia** occurs when the entire body cools because its ability to keep warm fails. This is a life-threatening condition.

9.5.2.1 Symptoms:

- a. Shivering
- b. Slow, irregular pulse
- c. Numbness
- d. Glassy stare
- e. Apathy or impaired judgment
- f. Loss of muscle control, no shivering, or loss of consciousness (late stages of hypothermia).

9.5.2.2 Treatment:

- a. Gently move the victim to a warm place.

- b. Check airway, breathing, and circulation.
- c. Care for shock.
- d. Remove wet clothing and cover person with blankets and plastic sheeting to hold body heat.
- e. Warm the victim slowly and handle carefully.

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**9.6. Flood Hazards**

**9.6.1** This information is provided to inform employees of the importance of protecting themselves against the hazards associated with floods, hurricanes, and tornadoes. Hurricanes and resultant tornadoes are often accompanied by heavy rains. Hurricanes can result in significant flooding; producing what may be relatively short-term, but unique hazards to utility crews. The purpose of this procedure is to assist gas and electric crews in flood hazard recognition and avoidance.

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**9.7. Flood Hazard Background**

**9.7.1** The aftermath of a flood presents a number of potential dangers for injury and disease. The dangers of flood do not end when the rains cease. Employees need to recognize the hazards of flood damaged properties and facilities in order to preserve personal health and safety.

**9.7.2** Flooding conditions and accompanying hazards may exist in basements, first floors, and other low-lying areas not located in the immediate flood zone. The same cautious approach should be used when evaluating and working in flooded areas, or in properties remote from the immediate flood zone.



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## **9.8. Infectious Disease Risk**

- 9.8.1** Floodwaters can carry infectious materials that may be harmful if proper precautions are not taken. Sewage contamination may be a concern in some areas. The primary route of infection is through open cuts or punctures that have come into contact with flood water or mud.
- 9.8.1.1 If a wound develops redness, swelling, or draining, seek medical attention IMMEDIATELY.
- 9.8.1.2 PPE, such as safety glasses, boots, gloves, and hard hats are effective in minimizing exposure to infectious material. Additional protection is afforded when rain gear, rubber boots/overshoes, and water resistant gloves are used. PPE combined with the use of good hygiene practices (washing of hands prior to eating, drinking, or smoking) SIGNIFICANTLY reduces the chances of infection.
- 9.8.1.3 First aid, even for minor cuts and burns, is important when exposure to waters potentially contaminated with human, animal, or toxic wastes exists. Clean open wounds and cuts with soap and clean water, or personal hand cleansers, as soon as possible. Most cuts, except minor scratches, sustained during flood cleanup activities will warrant medical evaluation and possible treatment to prevent tetanus. When potential contact with flood contaminated water or equipment is a concern, contact your immediate supervisor to make arrangements to be seen by a local medical provider for an evaluation.

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## **9.9. Mold Hazard**

- 9.9.1** Active mold growth is slimy or fuzzy and is usually white, green, black, orange, or purple. In early stages, mold may look like a fine web; in full bloom, it looks bushy. Mold spores spread easily; they are carried by air currents, pets, and people. Mold exposure may cause cold-like symptoms, watery eyes, sore throat, wheezing, dizziness, and trigger asthma attacks.

- 9.9.1.1 If you handle moldy materials, work outdoors when possible and wear PPE. In some circumstances, work in mold-contaminated environments may require respiratory protection. When respiratory protection is a concern, contact your local safety professional for assistance.
- 9.9.1.2 When entry into confined spaces, such as transformers and circuit breakers, or enclosed spaces, such as utility vaults, is contemplated, follow the EEC Confined/Enclosed Space Entry Program.

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**9.10. Physical Stress/Exhaustion**

- 9.10.1 Continued long hours of work, combined with physical exhaustion can create highly stressful situations for employees working in flood-damaged areas. Stress, long hours, and fatigue can increase the risks for injury and illness. Set priorities for work tasks and pace the work accordingly. Take rest breaks before exhaustion builds up. Get as much rest as possible during off hours. Be alert to emotional exhaustion and strain of employees and the public around you.

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**9.11. Snakes, Insects and Wild Animals**

- 9.11.1 Be extremely cautious in opening any closed electrical box or facility for snakes, insects, or other dangerous animals.
- 9.11.2 Tap or bang objects to flush out undesirable creatures.
- 9.11.3 Be cautious and vigilant for any domestic or wild animals since they may become extremely dangerous under these conditions.

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**9.12. Navigating Flooded Streets and Highways**

- 9.12.1 Swift Moving Water
  - 9.12.1.1 Avoid being struck by foreign objects. Swiftly moving waters can dislodge abandoned equipment, automotive parts (tires), and structural materials.

- 9.12.1.2 Avoid driving into flood areas when possible. Nearly half of all flash flood fatalities are auto-related. Avoid weakened bridges and washed-out roads. Two feet of water is enough to float and carry away a truck or bus.
- 9.12.1.3 Fast moving floodwater only six (6) inches deep can sweep (knock) you off your feet.
- 9.12.1.4 Moving water has the ability to rise swiftly. When entering moving water you are at risk of drowning, regardless of your ability to swim. Because those in vehicles are at greatest risk of drowning, it is important to comply with all hazard warnings on roadways and to avoid driving vehicles or heavy equipment into water of an unknown depth.

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### **9.13. Entry into Flood-Damaged Areas and Structures**

- 9.13.1 Fire can pose a major threat to an already badly damaged flood area due to water impregnated electrical equipment, inoperative fire protection systems, and hampered fire department response. Ensure that your fire extinguishers are inspected, filled, and operable prior to proceeding into the flood area.
- 9.13.2 Electrical Safety Risks
  - 9.13.2.1 Anticipate unauthorized reenergized electrical equipment by homeowners or contractors. Remember “back-feed” is always a threat under these conditions!
  - 9.13.2.2 Floodwaters may be electrically charged from underground or downed power lines.
  - 9.13.2.3 Electrically charged floodwaters may energize portions of the house structure. In severe cases, just touching the house (downspouts, siding, and screen doors) could cause electrocution.
  - 9.13.2.4 Crossing damp floors to shutoff the power at the breaker (fuse) box could cause electrocution.
  - 9.13.2.5 Electric generators may cause unanticipated electrical and combustion exhaust hazards.
  - 9.13.2.6 Gas and electric service should be turned off from outside of the house/structure whenever possible.

- 9.13.3** Flammable Gas Safety Risks
  - 9.13.3.1 Flammable gas present in homes, businesses, and enclosures due to gas leaks, chemical spills, or microbial action can ignite explosively in the presence of electrical arcing, sparking, burning tobacco, or open flames.
  - 9.13.3.2 **DO NOT SMOKE IN ENCLOSED FLOODED AREAS.** Gas and electric service should be turned off from outside of the house/structure whenever possible.
- 9.13.4** Structural Damage – Danger! Watch for structural failing! Leave the structure immediately if shifting or unusual noises signal a possible collapse.

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## **10. INCIDENT REPORTING GUIDELINES**

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### **10.1. Incident Reporting Guidelines**

- 10.1.1** The Incident Investigation (II) Procedure applies to all incidents that occur at EEC. The focus of the incident investigation procedure SHALL be on preventing injury and incident recurrence with clearly defined roles, responsibilities, and deadlines. This procedure will include consistent and timely communication points that address stakeholders.
- 10.1.2** All incidents, regardless of whether they result in injuries, illness, or property damage, SHALL be reported immediately to the person in charge and documented.
- 10.1.3** Upon notification of incident, the person in charge will notify the regional claims manager of incident details.
- 10.1.4** In the event of serious or fatal incident, refer to EEC Immediate Case Notification procedures.
- 10.1.5** Employees SHALL NOT admit liability, attempt to negotiate the settlement of claims, or promise payment for injuries or damage.

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**10.2. General Liability Incidents Involving Private or Public Property**

**10.2.1** General liability incidents only involve private or public property, but may occur both on and off company property. The person in charge, upon notification of the incident, SHALL contact the regional claims manager and provide incident details.

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**10.3. Auto Liability Incidents**

**10.3.1** All auto liability incidents involving company vehicles, no matter how minor, must be reported to the person in charge at once.

**10.3.2** If you are involved in an incident where there is damage to a vehicle or involve injury, state laws require that you stop your vehicle at the scene of the incident.

**10.3.3** When company vehicles are involved in an incident or you are just an observer, the driver SHALL:

**10.3.3.1 Step 1** – Stop immediately if you're either involved in the incident, or are the first on the scene.

**10.3.3.2 Step 2** – Set out warning devices so approaching motorists use caution.

**10.3.3.3 Step 3** – Help the injured by providing reasonable assistance.

**10.3.3.4 Step 4** – Contact law enforcement and let them know exactly where the crash took place.

**10.3.3.5 Step 5** – Document the incident while the events are still clear in your head.

**10.3.3.6 Step 6** – Contact the person in charge and follow their instructions.

**10.3.3.7 Step 7** – Complete an incident report. Incident/claims form(s) SHALL be kept in the glove compartment of all vehicles, and SHALL be completed in detail and sent to the regional claims manager.

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**10.4. First Report of Injury**

**10.4.1** Injuries Requiring First Aid

- 10.4.1.1 All injuries, no matter how minor, must be reported immediately to the supervisor and documented.
- 10.4.1.2 The person in charge SHALL be familiar with the contents of the first aid kit and methods of administering first aid.
- 10.4.1.3 First aid kits are located in all EEC-owned vehicles.
- 10.4.1.4 The contents of the first aid kits SHALL be visually inspected on a periodic basis and expended items SHALL be replaced.
- 10.4.1.5 It SHALL also be the duty of each employee to see that they receive proper first aid for all minor injuries.

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**10.5. Immediate Case Notification (ICN)**

**10.5.1** The Corporate Legal Department must immediately be notified of the following types of cases, incidents, and correspondence. Notification must be made regardless of whether or not EEC is believed to be at fault.

- 10.5.1.1 Incidents requiring ICN:
  - a. Fatality: Any incident which results in a fatality, regardless of the identity of the deceased (EEC employee, civilian, etc.).
  - b. Incidents involving serious bodily injury, including any burn or loss of limb cases.
  - c. Incidents where damage is anticipated to exceed \$50,000.
  - d. Incidents involving children (under age 18) or the elderly (over 60).
  - e. Environmental incidents.
  - f. Incidents which involve EEC flaggers (whether EEC employees or contract flaggers).
  - g. Incidents involving three or more vehicles.
  - h. Any auto incident which involves an occupied vehicle, regardless of fault for the incident, **MUST BE** reported to insurance company.

*Note: In such an instance, all documents, including a worker's compensation claim or root cause analysis, etc., must be written or reviewed by the EEC Corporate Legal Department before being issued to any party, including insurance company, agencies such as OSHA, and EEC customers.*

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10.5.1.2

Communications requiring immediate notification to Corporate Legal and/or Corporate Safety Department:

- a. Corporate Legal
  - Legal requests or demand letters from EEC customers for defense and indemnification.
  - PhOne Calls or letters of representation from attorneys.
  - All lawsuit actions, regardless of court in which action is filed or amount sought in the complaint.
  - Letters or notices from local, state, or federal agencies such as the Department of Labor, OSHA, Environmental Protection Agency (EPA), or those cases involving Equal Employment Opportunity Commission (EEOC), Civil Rights, etc.
- b. Corporate Legal and Corporate Safety
  - Letters or notices from local, state, or federal OSHA.
  - Site visits from OSHA or other regulatory agency SHALL be reported.
  - Letters or notices from local, state, or federal Environmental Protection Agency (EPA).

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## **11. INCIDENT INVESTIGATIONS PROCEDURE**

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### **11.1. Scope**

**11.1.1** This incident investigation process applies to all incidents that occur at EEC. The focus of the incident investigation process SHALL be on preventing injury and incident recurrence with clearly defined roles, responsibilities, and deadlines. This process will include consistent and timely communication points that address stakeholders.

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### **11.2. Policy Statement**

**11.2.1** The purpose of this procedure is to ensure that injuries and incidents are analyzed thoroughly and promptly, steps will be taken to avoid recurrence and information regarding the incident will be communicated openly to improve safety awareness. This procedure applies to incidents involving EEC employees, subcontractors, the public, equipment, and the environment. The analysis of public incidents being investigated by OSHA may include the involvement of the Corporate Legal Department.

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### **11.3. Principles**

**11.3.1** Operations' is responsible for conducting the incident investigation.

**11.3.2** Safety management personnel are responsible for working with Operations to ensure the quality of the investigation process.

**11.3.3** Ownership for the incident investigations is at the supervisory level.

**11.3.4** Directly involved employees are always included in the incident investigation process unless circumstances due to injury dictate otherwise.

**11.3.5** All incidents are investigated.



- 11.3.6 Investigations are completed in a timely manner.
- 11.3.7 Investigations are fact-based and blame free.
- 11.3.8 Investigations bring appropriate skill sets to bear to identify key factors, as well as appropriate actions to prevent recurrence.
- 11.3.9 Information about incidents and lessons learned are communicated openly to improve safety awareness.
- 11.3.10 Tracking corrective action items to completion is critical to the effectiveness of the program.
- 11.3.11 Data trends are used to guide safety actions.

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**11.4. Procedure Guidelines**

- 11.4.1 Management, labor, and safety professionals are jointly accountable and/or responsible for implementing the incident investigation procedure as outlined below.
  - 11.4.1.1 Make the initial response.
    - a. The immediate supervisor and employees involved in or witnessing an incident should take immediate actions to safeguard the site and seek proper medical attention for the injured person(s). Additionally, all efforts should be taken to preserve evidence that may help uncover key factors associated with the incident, including but not limited to:
      - Secure the scene and any vehicles, tools, and equipment involved in the incident.
      - Collecting and preserving any physical evidence including photographing the scene if necessary.
      - Documenting any interviews conducted to understand the incident.
      - Report initially through the line organization.
    - b. Employees SHALL report all incidents to their direct supervisor immediately. The supervisor SHALL then notify management who will then notify safety and claims as appropriate.

- Class A incidents SHALL be reported up through the Executive Safety Council (ESC).
- Class B incidents SHALL be reported up through the regional vice president.
- Class C incidents SHALL be reported up through the area manager.

*Refer to the EEC Incident Investigation Work Practice Matrix (located on the inside cover of EEC Job Briefing packet) as a quick reference to determine the severity level of the incident, team membership, required reports, and due dates.*

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- 11.4.1.2 Form the investigation team.
- 11.4.1.3 Determine the facts.
- 11.4.1.4 Determine the key factors/root cause(s).
- 11.4.1.5 Determine systems that need strengthening.
- 11.4.1.6 Recommend actions to prevent recurrence.
- 11.4.1.7 Document and receive approval of investigation results.
- 11.4.1.8 Communicate findings.

*Refer to the EEC Incident Investigation Procedure which can be obtained from regional operations management, regional safety personnel, or online at HMCentral for more information.*

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## **12. HAZARDOUS COMMUNICATION PROGRAM**

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### **12.1. General**

- 12.1.1** The Federal Hazard Communication Standard was designed to require employers to furnish their employees with information concerning the hazards of chemicals used in the workplace and protective measures employees can take to reduce their exposure to those chemicals.

*A written copy of EEC Hazardous Communication Program and Material Safety Data Sheets can be obtained at your area or regional office.*

*See Globally Harmonized System (GHS) regarding alternative methods for labeling, safety data sheets, and pictograms contained in this section.*

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**12.1.2** List of Hazardous Chemicals

12.1.2.1 The area office will maintain a list of all hazardous chemicals used within that facility, and update the list as necessary. The hazardous chemical list will be updated upon receipt of new hazardous chemicals at the facility.

**12.1.3** Material Safety Data Sheets (MSDSs) and Safety Data Sheets (SDSs)

12.1.3.1 The area office will maintain a MSDS/SDS catalog on each substance found on the list of hazardous chemicals used in their facility. MSDSs/SDSs will be readily available to all employees and contain the following information:

- a. Product and Manufacturer
- b. Composition/Ingredients
- c. Physical Characteristics
- d. Fire and Explosion Data
- e. Health Hazards & Treatment
- f. Spill and Control Measures
- g. Personal Protective Equipment

**12.1.4** Labels and Other Forms of Warning

12.1.4.1 All hazardous chemicals in the facility must be properly labeled. Labels should list the chemical identity, appropriate hazard warnings, and the name and address of the manufacturer, importer, or other responsible party.

12.1.4.2 Generally, the label provided by the manufacturer or supplier will meet all these requirements and no additional labeling will be required. Labels used for in-house containers will be consistent with labeling supplied by the manufacturer, such as the Hazardous Material Identification System (HMIS) labeling system.

**12.1.5** Training

- 12.1.5.1 Each employee who works with or is potentially exposed to hazardous chemicals SHALL receive initial training on the Hazardous Communication Program (a.k.a., Employee Right to Know) and the safe use of those hazardous chemicals.
- 12.1.5.2 Additional training will be provided for employees whenever a change of job assignment occurs or a new chemical is added to the inventory/workplace (should be covered in safety meetings).
- 12.1.5.3 Hazardous chemical training will be arranged by the safety manager or supervisor.
- 12.1.5.4 The training will emphasize these elements:
  - a. A summary of the standard and the written program.
  - b. Hazardous chemical properties including visual appearance and odor, and method that can be used to detect the presence of release of hazardous chemicals.
  - c. Physical and health hazards associated with potential exposure to workplace chemicals.
  - d. Procedures to protect against hazards, e.g., personal protective equipment, work practices, and emergency procedures.
  - e. Hazardous chemical spill and leak procedures.
  - f. Where MSDSs/SDSs are located, how to understand their content, and how employees may obtain and use appropriate hazard information.
  - g. The safety manager will monitor and maintain records of employee training.

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## **12.2. The Globally Harmonized System for Hazard Communication**

### **12.2.1 Background**

12.2.1.1 In 2003, the United Nations (UN) adopted the Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The GHS includes criteria for the classification of health, physical and environmental hazards, as well as specifying what information should be included on labels of hazardous chemicals as well as safety data sheets.

12.2.1.2 The international mandate for the GHS included the development of a harmonized hazard communication system, including labeling, safety data sheets (SDS), and easily understandable symbols based on the classification criteria developed for the GHS.

### **12.2.2** Introduction

12.2.2.1 The Hazard Communication Standard (HCS) is now aligned with the GHS. This update to the HCS will provide a common and coherent approach to classifying chemicals and communicating hazard information on labels and SDS.

12.2.2.2 The GHS is not in itself a regulation or a model regulation. It is a framework from which competent authorities may select the appropriate harmonized classification and communication elements. Competent authorities will decide how to apply the various elements of the GHS within their systems based on their needs and the target audience.

12.2.2.3 The GHS includes the following elements:










- a. Harmonized criteria for classifying substances and mixtures according to their health, environmental and physical hazards, and;
- b. Harmonized hazard communication elements, including requirements for pictograms, material safety data sheets and labeling.

### **12.2.3** Pictogram

12.2.3.1 OSHA’s required pictograms must be in the shape of a square set at a point and include a black hazard symbol on a white background with a red frame sufficiently wide enough to be clearly visible. A square red frame set at a point without a hazard symbol is not a pictogram and is not permitted on the label. OSHA has designated eight pictograms under this standard for application to a hazard category.

Figure 1: Hazard Communication Standard Pictogram

### HCS Pictograms and Hazards

<p style="text-align: center;"><b>Health Hazard</b></p>  <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive Toxicity</li> <li>• Respiratory Sensitizer</li> <li>• Target Organ Toxicity</li> <li>• Aspiration Toxicity</li> </ul>	<p style="text-align: center;"><b>Flame</b></p>  <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophorics</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>	<p style="text-align: center;"><b>Exclamation Mark</b></p>  <ul style="list-style-type: none"> <li>• Irritant (skin and eye)</li> <li>• Skin Sensitizer</li> <li>• Acute Toxicity (harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract Irritant</li> <li>• Hazardous to Ozone Layer (Non-Mandatory)</li> </ul>
<p style="text-align: center;"><b>Gas Cylinder</b></p>  <ul style="list-style-type: none"> <li>• Gases Under Pressure</li> </ul>	<p style="text-align: center;"><b>Corrosion</b></p>  <ul style="list-style-type: none"> <li>• Skin Corrosion/ Burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>	<p style="text-align: center;"><b>Exploding Bomb</b></p>  <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
<p style="text-align: center;"><b>Flame Over Circle</b></p>  <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<p style="text-align: center;"><b>Environment (Non-Mandatory)</b></p>  <ul style="list-style-type: none"> <li>• Aquatic Toxicity</li> </ul>	<p style="text-align: center;"><b>Skull and Crossbones</b></p>  <ul style="list-style-type: none"> <li>• Acute Toxicity (fatal or toxic)</li> </ul>

## 12.2.4 Hazard Communication SDSs

12.2.4.1 The HCS requires chemical manufacturers, distributors, or importers to provide SDSs (formerly known as material safety data sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

- a. **Section 1:** Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- b. **Section 2:** Hazard(s) identification includes all hazards regarding the chemical; required label elements.
- c. **Section 3:** Composition/information on ingredients includes information on chemical ingredients; trade secret claims.
- d. **Section 4:** First-aid measures include important symptoms/ effects, acute, delayed; required treatment.
- e. **Section 5:** Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- f. **Section 6:** Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.
- g. **Section 7:** Handling and storage lists precautions for safe handling and storage, including incompatibilities.
- h. **Section 8:** Exposure controls/personal protection lists OSHA's permissible exposure limits (PELs); threshold limit values (TLVs); appropriate engineering controls; personal protective equipment (PPE).
- i. **Section 9:** Physical and chemical properties lists the chemical's characteristics.
- j. **Section 10:** Stability and reactivity lists chemical stability and possibility of hazardous reactions.

- k. **Section 11:** Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- l. **Section 12:** Ecological information\*
- m. **Section 13:** Disposal considerations\*
- n. **Section 14:** Transport information\*
- o. **Section 15:** Regulatory information\*
- p. **Section 16:** Other information includes the date of preparation or last revision.

*\*Note: Since other agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).*


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## **12.2.5** Hazard Communication Standard Labels

- 12.2.5.1 OSHA has updated the requirements for labeling of hazardous chemicals under its HCS. As of June 1, 2015, all labels will be required to have pictograms, a signal word, hazard and precautionary statements, the product identifier, and supplier identification. A sample revised HCS label, identifying the required label elements, is shown in Figure 2 below.



Figure 2: Hazard Communication Standard Label Sample

SAMPLE LABEL	
<p style="text-align: center; color: #0070C0; font-weight: bold;">PRODUCT IDENTIFIER</p> <p><b>CODE</b> _____</p> <p><b>Product Name</b> _____</p> <p style="text-align: center; color: #0070C0; font-weight: bold;">SUPPLIER IDENTIFICATION</p> <p><b>Company Name</b> _____</p> <p>Street Address _____</p> <p>City _____ State _____</p> <p>Postal Code _____ Country _____</p> <p>Emergency Phone Number _____</p> <p style="text-align: center; color: #0070C0; font-weight: bold;">PRECAUTIONARY STATEMENTS</p> <p>Keep container tightly closed. Store in cool, well ventilated place that is locked.                      Keep away from heat/sparks/open flame. No smoking.                      Only use non-sparking tools.                      Use explosion-proof electrical equipment.                      Take precautionary measure against static discharge.                      Ground and bond container and receiving equipment.                      Do not breathe vapors.                      Wear Protective gloves.                      Do not eat, drink or smoke when using this product.                      Wash hands thoroughly after handling.                      Dispose of in accordance with local, regional, national, international regulations as specified.</p> <p><b>In Case of Fire:</b> use dry chemical (BC) or Carbon dioxide (CO<sub>2</sub>) fire extinguisher to extinguish.</p> <p><b>First Aid</b>                      If exposed call Poison Center.                      If on skin (on hair): Take off immediately any contaminated clothing. Rinse skin with water.</p>	<p style="text-align: center; color: #0070C0; font-weight: bold;">HAZARD PICTOGRAMS</p> <div style="text-align: center;">  </div> <p style="text-align: center; color: #0070C0; font-weight: bold;">SIGNAL WORD</p> <p style="text-align: center; font-size: 1.2em; font-weight: bold;">Danger</p> <p style="text-align: center; color: #0070C0; font-weight: bold;">HAZARD STATEMENT</p> <p style="text-align: center; font-weight: bold;">Highly flammable liquid and vapor.                      May cause liver and kidney damage.</p> <p style="text-align: center; color: #0070C0; font-weight: bold;">SUPPLEMENTAL INFORMATION</p> <p><b>Directions for use</b></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Fill weight: _____ Lot Number _____</p> <p>Gross weight: _____ Fill Date: _____</p> <p>Expiration Date: _____</p>

**12.3. Asbestos**

**12.3.1** EEC SHALL NOT perform work requiring the abatement of asbestos materials that includes the transportation and disposal of asbestos waste, unless otherwise approved by the Corporate Safety and/or Corporate Legal department.

- 12.3.2** The handling of asbestos-containing material SHALL only be performed under controlled conditions and by appropriately trained personnel according to the local, state, or federal EPA and/or OSHA laws, or regulations that apply to the work being done.
- 12.3.3** The safety department and the project manager SHALL be notified of any activities performed by EEC employees that will result in the disturbance of suspected asbestos-containing materials.
- 12.3.4** Supervisors that assess or manage jobs or facilities that pose possible exposure SHALL receive, at minimum, training consistent with the OSHA Class IV asbestos worker training requirements. Training SHALL consist of the following:
  - 12.3.4.1 Potential health effects associated with asbestos exposure;
  - 12.3.4.2 Building materials which commonly contain asbestos;
  - 12.3.4.3 The relationship between smoking and asbestos in producing cancer, and;
  - 12.3.4.4 Methods by which asbestos may become airborne.
- 12.3.5** If it is determined that asbestos removal (abatement) is required for the project to proceed, project management SHALL notify the customer.
- 12.3.6** The customer then SHALL make arrangements for the following:
  - 12.3.6.1 Notifying the property owner;
  - 12.3.6.2 Procuring the services of a licensed asbestos abatement contractor;
  - 12.3.6.3 Procuring the services of a consultant to monitor and conduct any necessary design, construction, administration, and monitoring as deemed necessary or as required by law.
- 12.3.7** All asbestos abatement contractors SHALL be responsible for meeting OSHA training and state licensing requirements.

## **12.4. Lead in Construction**

**12.4.1** Certain lead-related construction activities commonly produce exposures to lead. An employee should never perform any task that involves lead without first consulting his/her supervisor or safety department.

**12.4.2** This section is only to act as a guide in working around lead. Before such work can be completed, each employee must be in compliance with the EEC Lead in Construction Program.

**12.4.2.1** Engineering controls

- a. Engineering controls, such as ventilation and good work practices are the preferred methods of minimizing exposures to airborne lead at the worksite. Controls like:
- Substitution – Using a material that is less hazardous
  - Isolation – Enclosure of cable or structure containing the lead
  - Ventilation – The most important engineering control to control lead exposure

**12.4.2.2** Work practice controls

- a. Work practices involve the way a task is performed. Some fundamental and easily implemented practices are:
- Good housekeeping - good housekeeping involves a regular schedule of housekeeping activities to remove accumulations of lead dust or lead containing debris. Where feasible, lead-containing debris and contaminated items accumulated for disposal should be wet misted before handling.
  - Personal hygiene practices - hand and face washing prior to eating, drinking, using tobacco products, etc.

12.4.2.3 PPE

- a. At a minimum when working around lead, the following PPE should be worn:
  - Hard hat
  - Safety glasses/goggles
  - Protective clothing (disposable coveralls and shoe covers)
  - Respirator
  - Gloves
- b. At no time should the employee be allowed to leave the jobsite wearing lead-contaminated clothing or with lead-contaminated equipment.

*Refer to the EEC Hazardous Communication Program on HMCentral for a list of other hazardous chemicals.*

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## **13. FIRE PREVENTION, PROTECTION, AND SUPPRESSION**

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### **13.1. Three Components of a Fire**

**13.1.1** Fire is a chemical reaction that requires three components: heat, fuel, and oxygen. You must have all three components in sufficient quantity to maintain a fire, and likewise, you must remove one or more of the components to extinguish a fire.

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### **13.2. General Requirements**

- 13.2.1** Know the location of fire exits and fire alarms.
- 13.2.2** Don't let paper and other flammable materials accumulate.
- 13.2.3** Keep firefighting equipment ready for immediate use.
- 13.2.4** Keep fire exits and passageways clear.
- 13.2.5** Store flammable material in a safe area away from flame or extreme heat.

- 13.2.6** Do not use unapproved equipment or devices that have the capacity for self-combustion (example –unapproved battery packs).

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**13.3. In Case of Fire**

- 13.3.1** Warn others at risk.

- 13.3.2** If the fire or fire hazard cannot be safely contained and extinguished:

- 13.3.2.1 Pull fire alarm, if available;

- 13.3.2.2 Move to a safe location;

- 13.3.2.3 Report the fire by calling 911 for help;

- 13.3.2.4 Post lookouts to direct fire fighters to the location, if possible.

- 13.3.3** Assess if a fire or fire hazard can be safely contained and extinguished (if you can answer is yes to the following questions):

- 13.3.3.1 Have I been trained to assess a fire hazard?

- 13.3.3.2 Can I escape quickly and safely from the area if I attempt to extinguish the fire and do not succeed?

- 13.3.3.3 Do I have the right type of equipment/extinguisher?

- 13.3.3.4 Is the extinguisher large enough for the fire?

- 13.3.3.5 Is the area free from other dangers such as hazardous materials and falling debris?

- 13.3.3.6 **START TO EXTINGUISH THE FIRE!** Is the fire extinguished in 5 seconds? (If yes, then **STAY AND EXTINGUISH THE FIRE IF THE AREA IS SAFE.**)

- 13.3.4** How to extinguish a small fire using a fire extinguisher (PASS):

- 13.3.4.1 Pull the locking pin;

- 13.3.4.2 Aim the nozzle at the base of the fire;

- 13.3.4.3 Squeeze the trigger all the way closed;

- 13.3.4.4 Sweep side to side.

### **13.4. Fire Extinguishers**

- 13.4.1** Know where fire extinguishers are located at all times. Except for actual use, do not move or remove such equipment without proper authority.
- 13.4.2** Except for wheeled-type equipment, all fire extinguishers should be mounted.
- 13.4.3** Be familiar with both the location and the operation of all fire protective equipment in the vicinity of your work area.
- 13.4.4** Know the classes of fire, their burning characteristics, and the proper extinguishing agent to be used.
- 13.4.5** Do not enter confined spaces after using CO<sub>2</sub> extinguishers until the area has been thoroughly ventilated.
- 13.4.6** Fire Extinguisher Inspection / Maintenance
- 13.4.6.1 Daily inspection - the US Department of Transportation (DOT) requires a daily inspection of the fire extinguishers if a vehicle is being used.
- 13.4.6.2 Maintenance requirements:
- a. Fire extinguishers **SHALL** be maintained by qualified personnel annually or as required by the manufacturer.
  - b. Fire extinguisher monthly inspection must include the following:
    - Gauge: If the extinguisher is not fully charged (e.g., indicator in the green or 'charged' area), replace it immediately.
    - Hoses, connections, and seams: Replace the unit if you see any punctures, cuts, tears, fraying, leaks, or other signs of damage or wear.
    - Pull-pins (e.g., safety latch): Make sure they are in place and properly secured.
    - Mounting: ensure the unit(s) is securely mounted and readily accessible for use.
    - Read the labels on extinguishers and follow additional inspection requirements from the manufacturer.


- Rechargeable extinguishers SHALL be serviced and inspected after every use.
- Disposable extinguishers SHALL be disposed of properly and replaced after use.

**13.4.7** Classifications of Fire Extinguisher

13.4.7.1 Four basic classes of fire extinguisher exist.

- a. Class "A" extinguishes wood, paper, cloth, etc.
- b. Class "B" extinguishes gasoline, paints, oils, etc.
- c. Class "C" extinguishes electrical fires.
- d. Class "D" extinguishes combustible metals.

Figure 3: Fire Extinguisher Application Chart

CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
<b>A</b>	Wood, paper, cloth, trash & other ordinary materials.	
<b>B</b>	Gasoline, oil, paint and other flammable liquids.	
<b>C</b>	May be used on fires involving live electrical equipment without danger to the operator.	
<b>D</b>	Combustible metals and combustible metal alloys.	
<b>K</b>	Cooking media (Vegetable or Animal Oils and Fats)	

13.4.7.2 A fire extinguisher may be multi-class, for example, you could have an A, B, and C fire extinguisher that would extinguish three different types of fires.

13.4.8 Know the location of all the fire extinguishers in your work area, and know how to operate them.

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**13.5. Flammable, Combustible Liquids**

13.5.1 Keep solvents and other flammable materials in approved, properly labeled containers, and stored in metal flammable storage cabinets. Cabinets SHALL be labeled in conspicuous lettering, "Flammable-Keep Away from Open Flames."



- 13.5.2** Use only manufacturer approved, properly labeled, containers for flammable substances.
- 13.5.3** U.L.-approved, properly labeled, safety SHALL be used when transporting five (5) gallons or less of diesel and gas. A "safety can" is defined as an approved container holding five (5) gallons of gas/diesel or less with a spring-closing lid and spout cover, a means to relieve internal pressure and a flash-arresting screen. The spring-closing lid and spout cover is designed to keep liquid and vapor from escaping at ordinary temperatures, and to lift slightly when exposed to excessive outside heat. The most common safety can is the short and round red metal can with yellow labeling.
  - 13.5.3.1** Gasoline should be stored and dispensed only in U.L.-approved, properly labeled, safety cans.
  - 13.5.3.2** Diesel should be stored and dispensed only in U.L.-approved, properly labeled, yellow safety cans.
- 13.5.4** Gas cans should never be filled while in the back of a vehicles.
- 13.5.5** Shut off engines of vehicles and other equipment before adding fuel.
- 13.5.6** Obey NO SMOKING and STOP YOUR MOTOR signs at fuel dispensing locations.
- 13.5.7** Metallic contact must be maintained between the pouring and receiving containers when pouring or pumping gasoline or other flammable liquids from one container to another. This reduces static electrical charge hazard.
- 13.5.8** The use of gasoline or other highly flammable liquids for cleaning purposes or to start or stimulate fires is prohibited.
- 13.5.9** Use explosion proof flashlights when working around flammable or explosive atmospheres.
- 13.5.10** In any building, except one provided for their storage, flammable liquids must be limited to 25 gallons, in U.L. metal approved, properly labeled containers.
- 13.5.11** Do not use flammable liquids within 50 feet of open flames or other sources of ignition.

**13.5.12** Never use flammable liquids for general cleaning purposes.

**13.5.13** Keep sparks, flames, and excessive heat away from solvents and other flammable materials.

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**13.6. Smoking**

**13.6.1** All EEC employees SHALL adhere to all federal, state, and local laws related to smoking and exposure to second-hand smoke.

**13.6.2** Smoking or open flames SHALL NOT be permitted in areas where dangerous gases might be present; for example, oil rooms, hydrogen areas, acetylene storage, or similar areas. Neither SHALL smoking be permitted in storerooms, battery rooms, flammable liquid storage and use locations, or in other areas where quantities of combustible materials are kept. Absence of NO SMOKING signs does not excuse smoking in dangerous places.

**13.6.3** Smoking is prohibited when you:

13.6.3.1 Are around natural gas, diesel, oil, gasoline, or LP gasfuel stations and storage facilities;

13.6.3.2 Are servicing or inspecting batteries;

13.6.3.3 Are fueling vehicles or machines;

13.6.3.4 Are in or near a manhole, sewer, tank, tunnels, or where any flammable substances may be present.

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**13.7. Wild Fires**

**13.7.1** In addition to a normal fire extinguisher, crews working in fire prone areas require additional fire suppression equipment. If unsure of your area requirements, check with your supervisor for specific area requirements. It is also critical that each employee know the location and proper operating procedures for fire suppression equipment.

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## **14. HOUSEKEEPING**

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### **14.1. General Housekeeping Requirements**

- 14.1.1** Job sites, vehicles, and EEC yards and facilities SHALL be kept clean and in good order. Trash should be discarded daily.
- 14.1.2** Keep floors and platforms free of dangerous projections or obstructions and free from oil, grease, or water. Where the type of operation produces slippery conditions, mats, grates, cleats, or other methods SHALL be used to reduce the hazard from slipping.
- 14.1.3** Keep stairs, aisles, access roads, walkways, and the material storage areas in yards clear and free from obstructions and debris.
- 14.1.4** Materials and supplies should be stored in a manner to prevent slip, trip, and fall hazards.
- 14.1.5** Clean up spills promptly.

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## **15. TOOLS - HAND AND POWER**

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### **15.1. General Requirements**

- 15.1.1** All tools, regardless of ownership, SHALL be of an approved type and maintained in good condition.
- 15.1.2** Tools are subject to inspection at any time.
- 15.1.3** Do not attempt to bypass manufacturer installed safety devices.
- 15.1.4** Defective tools SHALL be tagged to prevent their use, and SHALL be either repaired or removed from use.
- 15.1.5** Tools should be used only for the purpose for which they were designed.

- 15.1.6** Hammers with metal handles, screwdrivers with metal continuing through the handle, and metallic measuring tapes SHALL NOT be used on or near energized conductors or equipment. The insulation on non-rated hand tools SHALL NOT be depended upon to protect users from electric shock.
- 15.1.7** Tools SHALL NOT be thrown from place to place or from person to person. Tools that must be raised or lowered from one elevation to another SHALL be placed in tool buckets or firmly attached to hand lines.
- 15.1.8** Tools SHALL NOT be left unsecured on scaffolds, platforms, or other elevated places where their falling could endanger others.
- 15.1.9** Impact tools such as chisels, punches, drift pins, and hammers, that become worn, mushroomed, or cracked, SHALL be dressed before further use or replaced.
- 15.1.10** Sharp-edged tools SHALL be kept sharpened.
- 15.1.11** Hand tools SHALL be used in such a way as to prevent injury in case of a slip.
- 15.1.12** Chisels, drills, punches, ground rods, and pipe SHALL be held with suitable holders or tongs, not with the hands, while being struck by another employee.
- 15.1.13** Adjustable wrenches SHALL be pulled so force is applied to the side of the fixed jaw.
- 15.1.14** Only approved extensions SHALL be used for added leverage.
- 15.1.15** Tools with sharp edges SHALL be stored and handled so they will not cause injury.
- 15.1.16** Hand tools, other than pocket knives or equivalent pocket tool, SHALL NOT be carried in pockets.
- 15.1.17** Tool handles SHALL be kept clean of oil and grease.
- 15.1.18** When working on or above open grating, the grating SHALL be covered to prevent tools or parts from dropping to a lower level, or the danger area below SHALL be barricaded or guarded.

- 15.1.19** Files and rasps SHALL be used with handles. They SHALL NOT be used as a pry, nor SHALL they be struck.
- 15.1.20** Workers using jackhammers, digging bars, or other hand tools when working in proximity (inside One Call locates) to electrical power lines SHALL wear insulated protective gloves and dig prudently (slow and easy).

*Refer to Locating All Utilities & Records Awareness (LAURA) on HMCentral for more information*

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## **15.2. Portable Electric Tools**

- 15.2.1** The non-current carrying metal parts of a portable electric tool, such as drills, saws, and grinders SHALL be effectively grounded when connected to a power source unless:
  - 15.2.1.1** The tool is an approved double-insulated type;
  - 15.2.1.2** Tool is connected to a ground fault interrupter;
  - 15.2.1.3** Connected by means of an isolating transformer;
  - 15.2.1.4** Protected by an “assured grounding system” or GFCI.
- 15.2.2** All power tools SHALL be inspected prior to use to ensure safe operation.
- 15.2.3** Do not use hoses or electric cords for hoisting or lowering tools or other materials.
- 15.2.4** Power tools SHALL be used only within their design capability and SHALL be operated in accordance with the instructions of the manufacturer.
- 15.2.5** All tools SHALL be kept in good repair and should be disconnected from the power source while repairs or adjustments are made.
- 15.2.6** Electric tools SHALL NOT be used where there is a hazard of flammable vapors, gases, or dust.

- 15.2.7 Cords used with portable electric tools that are not double insulated SHALL be of three wire ground type. Inspect cords, welding leads, and other wiring to be certain they are properly insulated. Do not use frayed or damaged cords.
- 15.2.8 Be sure that a power tool is off and motion stopped before setting tool down.
- 15.2.9 All tools or cords SHALL be disconnected by grasping the plug, not the cord.
- 15.2.10 GFCIs SHALL be used when an electric tool is used outside or in an enclosed vessel.
- 15.2.11 Keep moving parts of power tools pointed away from your body.
- 15.2.12 Keep extension power cords out of pedestrian and vehicular pathways.

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**15.3. Abrasive Wheels and Discs**

- 15.3.1 Be sure that grinder stones and disks are equipped with proper protective guards.
- 15.3.2 Check grinder stones and discs daily for nicks, cracks, or other defects; replace immediately if damaged.
- 15.3.3 Wear proper eye and face protection during all grinding operations.
- 15.3.4 Handle grinders carefully. If dropped, inspect grinder and stone/disc at once for damage.
- 15.3.5 Grinding wheel should fit freely on the spindle. Never force them on. The spindle nut should be tightened only enough to hold the wheel in place.
- 15.3.6 Never use a machine with a loose spindle.

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**15.4. Pneumatic and Hydraulic Tools**

- 15.4.1 Powered tools SHALL be operated only by competent persons who have been instructed in their use.

- 15.4.2** Always secure pneumatic power tools to the hose or whip by some positive means to prevent the tool from becoming incidentally disconnected.
- 15.4.3** Safety clips or retainers SHALL be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being incidentally expelled.
- 15.4.4** Before using compressed air to clean equipment:
  - 15.4.4.1** Evaluate for airborne hazards and safeguard against;
  - 15.4.4.2** Control access to work area;
  - 15.4.4.3** Reduce air pressure to < 30 psi.
  - 15.4.4.4** Pneumatic tools should never be pointed at another person.
- 15.4.5** Never use compressed air to blow dust or dirt from clothing. Serious injury could result from direct air pressure.
- 15.4.6** Do not exceed the manufacturer's stated safe operating pressure for hoses, pipes, valves, filters, and other fittings.
- 15.4.7** Do not use hoses for hoisting or lowering tools.
- 15.4.8** All compressed air hoses exceeding 1/2-inch inside diameter should have a safety device at the source of supply or branch line to reduce pressure in event of hose failure.
- 15.4.9** Before making adjustments or changing air tools, unless equipped with quick-connectors, shut-off the air at the air supply valve ahead of the hose. The hose should be bled at the tool before breaking the connection.
- 15.4.10** All repairs made to compressed air hoses SHALL be to manufacturer repair specifications and performed by a competent person.
- 15.4.11** Conductive hose SHALL NOT be used near energized equipment.

**15.5. Powder-Actuated Tools**

- 15.5.1** Only those employees who are qualified to use powder-actuated tools SHALL do so.
- 15.5.2** Explosive charges SHALL be carried and transported in approved containers.
- 15.5.3** Operators and assistants using these tools SHALL wear eye protection (safety goggles and/or face shield), gloves, and a hard hat.
- 15.5.4** Tools SHALL be maintained in good condition and serviced regularly, as per manufacturer's instructions.
- 15.5.5** This equipment SHALL be used only upon approved materials. Operator SHALL know the construction and composition of any materials the tool is being used upon.
- 15.5.6** Prior to use, the operator SHALL ensure that the protective shield is properly attached to the tool.
- 15.5.7** The operator SHALL inspect the tool to be sure that it is clean, moving parts operate freely, and the bore is free from obstructions. The bore SHALL be cleared before using. A charge SHALL NOT be fired to clear the bore.
- 15.5.8** A defective tool SHALL be tagged with a repair tag and immediately removed from service.
- 15.5.9** Powder-actuated tools SHALL NOT be used in an explosive or flammable atmosphere.
- 15.5.10** Tools SHALL NOT be loaded until just prior to the intended use. Tools SHALL be unloaded immediately when work is suspended. Never store a powder-actuated tool when it is loaded.
- 15.5.11** Only cartridges with an explosive charge adequate for the job and with proper penetration SHALL be used.
- 15.5.12** Tools and cartridges SHALL NOT be left unattended.
- 15.5.13** Tools SHALL be held perpendicular to the work surface.
- 15.5.14** Tools, loaded or unloaded, SHALL NOT be pointed at any person.



- 15.5.15** In case of a misfire, the operator SHALL hold the tool in place for 30 seconds. The operator SHALL then try to operate the tool a second time, and, if unsuccessful, SHALL wait another 30 seconds. Misfired cartridges SHALL then be removed, placed in metal container and returned to the supervisor.
- 15.5.16** Prior to firing a powder-actuated tool, advance warning SHALL be given.

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**15.6. Chain Saws**

- 15.6.1** Only employees trained in use and safe operation are permitted to operate the saw.
- 15.6.2** The following PPE must be used when operating chain saws: head protection, hearing protection, eye/face protection, leg protection (chain saw chaps), foot protection, and hand protection.
- 15.6.3** Saws SHALL be stored in carrying cases, or the guard over the blade, when not in use.
- 15.6.4** A saw holder SHALL be used when carrying saws in aerial baskets.
- 15.6.5** Chain saw SHALL be placed on a stable base when starting.
- 15.6.6** Always stop a chain saw while being refueled, serviced, or maintained.
- 15.6.7** Always know the location of your fellow workers in the area when using a chain saw.
- 15.6.8** Always grip the chain saw with both hands during the entire cutting operation.
- 15.6.9** Never use a gasoline driven chain saw above shoulder level.

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## **16. MATERIAL HANDLING**

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### **16.1. General**

- 16.1.1** Material handling is a task that almost every worker performs, either as a one-time or infrequent duty or as part of regular work.
- 16.1.2** Material handling encompasses a wide range of work activities – from occasional movement of very large loads with cranes and powered industrial trucks to routine, repetitive lifting of relatively light objects and tasks that are incidental to a worker’s regular, daily activities, such as an office move.

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### **16.2. Hazards**

- 16.2.1** The hazards associated with improper material handling include being struck by a load, losing control of a load, physically overexerting oneself, and exceeding equipment capacities.
- 16.2.2** Material-handling incidents account for a sizable percentage of all occupational injuries that occur in every work area. The risk of injury is not confined to manual lifting of heavy objects.

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### **16.3. Controls for Protection against Injury - Work Planning**

- 16.3.1** The likelihood of injuries significantly increases when lifting or moving bulky, heavy objects that cannot be held close to the body.
- 16.3.2** Injuries can also occur when conducting repetitive lifts of lighter objects over long periods of time.
- 16.3.3** Incidents and injuries related to material handling may occur when a worker performs a task without the required assistance, or because of inadequate worker training, poor judgment, poor selection, or improper use or maintenance of equipment.

- 16.3.4** Supervisors and workers SHALL perform an appropriate analysis to determine the proper technique or lifting device required for all material-handling activities.
- 16.3.5** As part of the analysis, consider whether a worker is able to carry out the materials-handling task in question, even with assistance. In addition, consider the following other factors:
  - 16.3.5.1 Object characteristics
  - 16.3.5.2 Weight, length, width, height, and depth
  - 16.3.5.3 Center of gravity (i.e., weight distribution within object)
  - 16.3.5.4 Handles, texture, and grasp point
  - 16.3.5.5 Stability (particularly in the case of liquids and bulky items)
  - 16.3.5.6 Workplace configuration
  - 16.3.5.7 Height of lifts
  - 16.3.5.8 Carrying distance and direction changes
  - 16.3.5.9 Obstacles (e.g., stairs and slopes)
  - 16.3.5.10 Traction on working surfaces (i.e., observe whether surfaces are slippery, smooth, or rough)
  - 16.3.5.11 Task characteristics
  - 16.3.5.12 Forward reach
  - 16.3.5.13 Duration, frequency, and pace
  - 16.3.5.14 Temperature, lighting, and humidity
  - 16.3.5.15 Work organization (e.g., teamwork, time pressure, and the availability of help)
  - 16.3.5.16 Mechanical lifting devices
  - 16.3.5.17 Weight demand and equipment limitations (i.e., load limit)
  - 16.3.5.18 Accessibility requirements
  - 16.3.5.19 Worker experience
  - 16.3.5.20 Maintenance status

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**16.4. Precautions for Safely Lifting and Handling Materials**

- 16.4.1** When lifting or handling materials manually, use only methods that ensure your safety and that of the material.
- 16.4.2** Never attempt to lift objects that are too heavy or bulky to handle safely. Never overestimate your ability to perform a task.
- 16.4.3** Whenever possible, push rather than pull loads: Pushing uses the strong leg muscles, whereas pulling uses the easily strained back muscles.
- 16.4.4** When occasional lifts of compact loads are required, observe the following precautions:
- 16.4.4.1** Loads should be handled no more than seven inches in front of the body as measured from the ankles. The heavier a load, the more closely to the body the load should be held.
- 16.4.4.2** Very low lifts (10 inches or less from the floor) are not desirable because of the difficulty of maintaining balance when squatting to lift.
- 16.4.4.3** Medium lifts (30–54 inches from the floor) are more desirable because more strength is available in the lower part of this height range.
- 16.4.4.4** High lifts are not recommended, except when the item to lift weighs less than 10 lbs.
- 16.4.5** Muscle fatigue can potentially occur where lifting is required more than once every two to five minutes. Therefore, the weight for repetitive lifts should be less than that for occasional lifts.
- 16.4.6** Moving objects by sliding, rather than lifting, is recommended for repetitive handling tasks.
- 16.4.7** For ease of manipulation during subsequent moves, heavy items should be stored on racks, shelves, or the like at elbow level. Lighter items may be stored at either higher or lower levels.

## **16.5. Safe Lifting Practices**

- 16.5.1** Recommended Safe Practices for Lifting/Moving Heavy Objects
  - 16.5.1.1 Provide good handholds on an object to be carried.
  - 16.5.1.2 Firmly grip an object to be carried.
  - 16.5.1.3 Use carts and handling aids to support an object's weight.
  - 16.5.1.4 Try to minimize the distance that an object is moved.
  - 16.5.1.5 Carry a load close to your body and at a proper height from the floor.
  - 16.5.1.6 Push or pull objects whenever possible, rather than lifting or lowering objects.
  - 16.5.1.7 Position storage materials on racks or shelves in ways that make handling easier (e.g., place the heaviest objects at elbow height).
  - 16.5.1.8 Keep your torso in a neutral, upright position whenever possible when lifting a heavy load.
  - 16.5.1.9 Do not twist or bend while lifting or handling a heavy load.
  - 16.5.1.10 Do not use jerking motions to move a load.
  - 16.5.1.11 Warm up before starting a strenuous task after a less strenuous task (e.g., changing from sitting to performing a rapid, dynamic task).
  - 16.5.1.12 Avoid lowering materials that need to be later lifted.
  - 16.5.1.13 Plan movements of material in direct paths (i.e., do not zigzag or backtrack).
  - 16.5.1.14 Avoid using stairs when handling heavy objects.
  - 16.5.1.15 Use an adjustable/tiltable table or a reach extender to reduce forward bending or extended reaches.
  - 16.5.1.16 Use a step stool or low platform to reduce back hyperextension.
  - 16.5.1.17 Use roller bearings or roller conveyors to reduce twisting.

**16.6. Pre-Lift Inspections and Considerations**

**16.6.1 Heavy Object Weighing 50 lbs. or Greater:**

16.6.1.1 When an object(s) need to be lifted/moved weighing 50 lbs. or greater, and mechanical means of lifting/moving object(s) is not available, team lifting is required.

16.6.1.2 Team lifts

- a. When team lifting is required, try to make sure that the individuals involved are similar in size and physique.
- b. One person should act as the leader and give commands on when to lift or lower the object.
- a. Two or more workers transporting a large load should adjust the load to ride level so that each person carries equal weight.
- b. Long objects (e.g., pipe or lumber) should be carried at the same level, and the workers should walk in step.

16.6.1.3 Inspect the load for sharp edges, splinters, and wet or greasy spots.

16.6.1.4 At minimum, basic PPE is required; if necessary, wear a long-sleeved shirt when lifting or handling objects with sharp or splintered edges. To ensure a good grip on the object, make sure the gloves are free of oil, grease, or other slippery materials.

16.6.1.5 Inspect the route over which the load is to be carried. The route should be free of obstruction or spills that could cause tripping or slipping.

16.6.1.6 Consider the distance over which the load is to be carried. Gripping power may weaken over long distances.

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## **17. WELDING/CUTTING/BRAZING/GRINDING**

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### **17.1. General Safe Work Practices**

- 17.1.1** Prior to beginning any welding, cutting, or grinding, operations evaluate specialized PPE requirements that must be worn, and make sure they are documented on the job brief.
- 17.1.2** Prior to performing welding, cutting, or grinding, evaluate and safeguard the work area and remove any flammable material.
- 17.1.3** During welding, cutting, or grinding operations keep areas clean and free from accumulations of trash, rags, and other flammable items.
- 17.1.4** Assign a fire watch with a suitable fire extinguisher to welding, cutting, and grinding operations in work areas with flammable materials, or where fire or sparks cannot be contained in the immediate work area.
- 17.1.5** When using a fire watch, maintain it for 30 minutes after the work is complete.
- 17.1.6** When welding, cutting, or grinding in elevated areas, cover the grating as much as possible and post a fire watch below as needed.
- 17.1.7** Before applying heat, thoroughly clean, decontaminate, and/or purge machinery, tanks, drums, etc., that could contain explosives or flammable materials.
- 17.1.8** Use welding screens whenever other persons or public could be directly exposed to welding, cutting, or grinding operations.
- 17.1.9** For all hot-work operations in congested areas (e.g., boilers, preheaters, feed-water heaters, and moisture-separator reheaters) wear clothing appropriate for welding.
- 17.1.10** Clothing that is not appropriate for welding includes:
  - 17.1.10.1** Synthetics such as nylon, polyester, acetate, and rayon;

- 17.1.10.2 Blends of these synthetics such as polyester/cotton;
- 17.1.10.3 Flame-resistant clothing intended for electrical work, including light weight Nomex and PBI-Kevlar.
- 17.1.11 When extreme conditions exist, wear leather sleeves, aprons, and welding coats.
- 17.1.12 While performing any hot-work operation, dress appropriately to protect exposed skin from sparks, radiant heat, and hot surfaces.
- 17.1.13 When performing welding/cutting operations eliminate the possibility of sparks being caught in cuffed pants.
- 17.1.14 When coveralls are worn for body protection, ensure that either a zip-front type is worn or that the flaps of button-type coveralls are secured with no openings.
- 17.1.15 When welding on a crane or suspended load, establish an independent ground.
- 17.1.16 Where air contaminants exceed permissible exposure limits use proper ventilation/respiratory protection.
- 17.1.17 For stationary manifold systems, follow manufacturer system design criteria.

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## **17.2. Grinding**

- 17.2.1 Inspect grinders before use to ensure the grinder is in good repair and all safety guard devices are properly attached.
- 17.2.2 Ensure guards on 90-degree grinders are between the user and the wheel.
- 17.2.3 Before operating a grinder, ensure guards are in place unless you are guarded from the wheel by the work object.
- 17.2.4 Before installing a grinding wheel, check the grinder to ensure the spindle speed does not exceed the maximum operating speed indicated on the wheel.
- 17.2.5 Before changing wheels or rocks, disconnect grinders from energy source.
- 17.2.6 Keep hand-held grinders in control until the wheel or rock comes to a complete stop.



- 17.2.7** Operate and control grinders according to manufacturer's recommendations (one-hand/two-hand operations).
- 17.2.8** Do not make adjustments to tool rests while the wheel is in motion.
- 17.2.9** Where tool rests are required, adjust them to a maximum of 1/8 inch from the wheel. Ensure the distance between the wheel periphery and the adjustable tongue on the end of the peripheral member at the top never exceeds 1/4 inch
- 17.2.10** Before installing wheels on stationary grinders, ring-test them to ensure integrity.
- 17.2.11** On pedestal or bench grinders, ensure wheel or rock comes to a complete stop before you leave the area.
- 17.2.12** Use hold down clamps, vise grips, or other tools for grinding small parts, or clamp material in a vise for portable grinding.
- 17.2.13** Use the following required personal protective equipment:
  - 17.2.13.1 Gloves
  - 17.2.13.2 Full-face shields
  - 17.2.13.3 Hearing protection
  - 17.2.13.4 Safety glasses
  - 17.2.13.5 Respirators where required

*Note: Wear mono goggles if the severity of the tasks requires additional protection to ensure against eye injury.*

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- 17.2.14** Assemble air grinders according to the manufacturer's recommendations.

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### **17.3. Arc and Tig Welding**

- 17.3.1** Inspect electrical welding equipment before and after each use. Immediately remove defective electrical welding equipment from service, identify it, and do not use it until repaired.

- 17.3.2** Use manufacturer's approved methods to repair damaged welding cables.
- 17.3.3** Do not use cables with splices within 10 feet of the electrode holder.
- 17.3.4** When electrode holders are not in use, place them so that they cannot make electrical contact with persons or conductive objects.
- 17.3.5** When filler wire is not in use, remove it from the electrode holder.
- 17.3.6** When tungsten is not in use, push it inside the cup, or remove it.
- 17.3.7** Dispose of all used filler material in a designated container.
- 17.3.8** When TIG welding in a confined or congested area, wear clothing appropriate for welding.
- 17.3.9** When arc welding in an overhead position or in a confined area, wear clothing appropriate for welding.
- 17.3.10** When air arcing, wear hearing protection and clothing appropriate for welding.
- 17.3.11** Clothing that is not appropriate for welding includes:
  - 17.3.11.1** Synthetics such as nylon, polyester, acetate, and rayon;
  - 17.3.11.2** Blends of these synthetics such as polyester/cotton;
  - 17.3.11.3** Flame-resistant clothing intended for electrical work, including light weight Nomex and PBI-Kevlar.
- 17.3.12** When ventilation does not reduce airborne contaminants below the permissible exposure limits, wear respiratory protection.
- 17.3.13** Wear welding gloves in all welding operations.
- 17.3.14** Wear full-face welding hoods. (Other shields may be used if the work cannot be performed with a full-face hood.)
- 17.3.15** When in a confined space or area, follow the EEC Confined Space Program.
- 17.3.16** Use the following required personal protective equipment:
  - 17.3.16.1** Welding gloves

- 17.3.16.2 Safety glasses
- 17.3.16.3 Approved welding shields

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**17.4. Oxygen/Acetylene Safety**

- 17.4.1 Inspect oxygen/acetylene equipment before use. Immediately remove defective equipment from service, identify it, and do not use it until repaired.
- 17.4.2 Do not permit oil or grease to come in contact with regulators, fittings, valves, gauges, and the torch assembly.
- 17.4.3 Ensure the pressure of the oxygen and the acetylene does not exceed manufacturer's recommendation for the particular cutting or brazing operation being performed.
- 17.4.4 When opening the valves on a regulator, always stand to one side and away from the valve opening.
- 17.4.5 Before installing a regulator, crack the valve to remove any dirt or trash that could damage the regulator.
- 17.4.6 When installing regulators, use the proper tool and do not over-tighten connections.
- 17.4.7 Before opening the cylinder valve, back out the regulator handle. Then slowly adjust the regulator pressure.
- 17.4.8 Before removing a regulator, close the cylinder valve and release all gas from the hose and regulator.
- 17.4.9 When oxy/acetylene equipment is not in use, close cylinder valves and release the pressure in the hose.
- 17.4.10 Always open the oxygen cylinder valve slowly, allowing it to backseat.
- 17.4.11 Do not use acetylene at pressure exceeding 15 pounds per square inch gauge (psig).
- 17.4.12 Always use and store acetylene cylinders in an upright position.
- 17.4.13 Use a friction or stationary striker to light a torch. Do not light torches with matches, cigarette lighters, or hot work.

- 17.4.14** To protect against flashback, ensure all oxy/acetylene equipment is equipped with flashback arresters at the regulator outlet and at the torch for both gases. A check valve alone does not satisfy this requirement.
- 17.4.15** Remove gauges and replace caps on oxy/acetylene cylinders when they are not in use, or the possibility exists that the valve could be damaged by being bumped or knocked over.
- 17.4.16** Ensure valve handles and/or wrenches are in place and used.
- 17.4.17** When ventilation does not reduce airborne contaminants below the permissible exposure limits, wear respiratory protection.
- 17.4.18** Do not use acetylene at a rate exceeding 1/7 of the contents of the cylinder per hour.
- 17.4.19** Remove oxygen and acetylene cylinders from a standard dolly cart and return to storage if it can be reasonably anticipated that the cylinders will not be used in the next 24 hours.
- 17.4.20** Use the following required PPE:
  - 17.4.20.1 Burning goggles
  - 17.4.20.2 Welding gloves
  - 17.4.20.3 Face shield

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**17.5. Torches**

- 17.5.1** Torches SHALL be inspected, at the beginning of each working shift, for leaking shutoff valves, hose couplings, and tip connections. Defective torches SHALL NOT be used.
- 17.5.2** Hoses SHALL be purged individually before lighting the torch for the first time each day. Hoses SHALL NOT be purged into confined spaces or near ignition sources.
- 17.5.3** Clogged torch tip openings SHALL be cleaned with suitable cleaning wires, drills, or other devices designed for such purposes.

- 17.5.4 Torches SHALL be lighted by friction lighters or other approved devices, not by matches or from hot work.
- 17.5.5 Torch valves SHALL be closed and the gas supply shut off whenever work is suspended.
- 17.5.6 The torch and hose SHALL be removed from confined spaces whenever work is suspended.

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**17.6. Compressed Gas Cylinders**

- 17.6.1 Secure cylinders upright, using substantial means suitable for the conditions.
- 17.6.2 Ensure securing devices are capable of supporting the weight of the secured cylinders.
- 17.6.3 Tape, string, ribbons, or rope less than 0.25 inch in diameter is not acceptable.
- 17.6.4 If two devices are used, the cylinder must be secured between the top half and the bottom half of the cylinders.
- 17.6.5 Identify, tag, and remove from service damaged cylinders and notify supplier.
- 17.6.6 When cylinders are not in use and are designed to accept a cap, ensure valve-protection caps are in place and hand-tight.
- 17.6.7 Do not store cylinders near combustible materials (e.g., waste, rags, oil, or grease).
- 17.6.8 Ensure compressed gas cylinders are properly identified and labeled.
- 17.6.9 Do not store or set up cylinders near heat-producing devices or open flames.
- 17.6.10 Do not store oxygen and flammable gas cylinders such as acetylene together. Separate them by 20 feet or a half-hour flame-resistant barrier five (5) feet high.
- 17.6.11 Keep cylinders upright during transport.
- 17.6.12 Do not use valve-protection caps for lifting cylinders.

- 17.6.13** Before lifting or moving cylinders, ensure valve-protection caps are in place.

*Note: Welding cylinders secured in carts may be moved short distances over level surfaces without removing the regulator and adding valve-protection caps.*

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- 17.6.14** Compressed gas cylinders may be stored in the sun, but storage area temperatures must not exceed 125°F.
- 17.6.15** Compressed gas cylinders having residual product must be considered full and stored appropriately.
- 17.6.16** Tag or mark empty cylinders **EMPTY or MT**, and keep valves closed and protective caps in place.
- 17.6.17** Do not smoke, weld, or use open flames near compressed gases that are flammable, oxidizing, or reactive.
- 17.6.18** When using compressed gas cylinders for welding operations, keep them far enough away from actual welding or cutting operations to prevent hot slag or flames from reaching them.

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## **18. LADDERS AND SCAFFOLDING**

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### **18.1. General Ladder Requirements**

- 18.1.1** Ladder platforms/rolling scaffolding are preferred use as an alternative to a ladder.
- 18.1.2** Ladders SHALL be used only on stable and level surfaces unless secured to prevent accidental displacement.
- 18.1.3** Only approved ladders SHALL be used in a safe manner. Manufacturers' weight limit SHALL NOT be exceeded.
- 18.1.4** All portable ladders SHALL be of sufficient length and SHALL be placed so that workers will not stretch or assume a hazardous position.

- 18.1.5** Portable ladders used as temporary access SHALL extend at least three (3) feet (0.9 meters) above the upper-landing surface.
- 18.1.5.1** When a three-foot extension is not possible, a grasping device (such as a grab rail) SHALL be provided to assist employees in mounting and dismounting the ladder.
- 18.1.5.2** In no case SHALL the length of the ladder be such that ladder deflection under a load would, by itself, cause the ladder to slip from its support.
- 18.1.6** The length of portable stepladders SHALL NOT exceed 20 feet. A portable step ladder should not be used as a substitute for a straight ladder.
- 18.1.7** When splicing is required to obtain a given length of side rail, the resulting side rail must be at least equivalent in strength to a one-piece side rail made of the same material.
- 18.1.8** The ladder SHALL be moved as work progresses to avoid overreaching. Two ladders SHALL never be lashed together to make a longer one.
- 18.1.9** Ladders SHALL be surfaced so as to prevent injury to an employee from punctures or lacerations and to prevent snagging of clothing.
- 18.1.10** A metal spreader bar or locking device SHALL be provided on each stepladder to hold the front and back sections in an open position.
- 18.1.11** Ladders SHALL NOT be placed in passageways, doorways, driveways, or any locations where they may be displaced by any other work unless protected by barricades or guards.
- 18.1.12** Portable ladders SHALL be used at such a pitch that the horizontal distance from the top support to the foot of the ladder will not be greater than one-fourth the vertical distance between these points.
- 18.1.13** When using a straight or extension ladders, employees SHALL NOT climb past the third rung from top.

- 18.1.14** Portable metal ladders and other portable conductive ladders may not be used near exposed energized lines or equipment.
- 18.1.15** Only one employee at a time SHALL work on a ladder (exception for rescue or transmission work).

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**18.2. Use of Ladders**

- 18.2.1** No work requiring lifting of heavy materials or substantial exertion SHALL be done from ladders.
- 18.2.2** When ladders are the only means of access to or from a working area for 25 or more employees, or when a ladder is to serve simultaneous two-way traffic, double-cleated ladders SHALL be used.
- 18.2.3** Portable ladders SHALL have slip-resistant feet.
- 18.2.4** Ladders SHALL NOT be moved, shifted, or extended while occupied.
- 18.2.5** When using portable step ladders, the second from the top step and the top step SHALL NOT be used. Example: A six-foot ladder allows user to climb to the fourth rung from the bottom; eight-foot ladder allows user to climb to the sixth rung from the bottom, etc.
- 18.2.6** Ladders SHALL be inspected for visible defects on a daily basis and after any occurrence that could affect their safe use.
- 18.2.7** Broken or damaged ladders SHALL be immediately tagged or marked "DO NOT USE," or similar wording, and withdrawn from service until restored to a condition meeting their original design. If unable to restore ladder to original design, damaged ladders SHALL be cut or otherwise destroyed and discarded to prevent further use.
- 18.2.8** Ladders SHALL be restricted to their intended use.
- 18.2.9** Ladders SHALL NOT be climbed by more than one person at a time.
- 18.2.10** Employees SHALL NOT sit or straddle portable stepladder.



- 18.2.11** All portable ladders SHALL be carried in a balanced manner with neither end touching the ground.

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**18.3. General Requirements for Scaffolds**

**18.3.1 Design**

- 18.3.1.1 29 CFR 1926.451(a)(6) mandates that scaffolds SHALL be designed by a qualified person and SHALL be constructed and loaded in accordance with that design.
- a. The dimensions of the members and materials used in the construction of various working platforms or scaffolds SHALL conform to the sizes shown in the ANSI A10.8 tables.
  - b. Scaffolds SHALL be plumb and level.
  - c. Scaffolds (other than suspended scaffolds) SHALL bear on base plates upon sills or other adequate foundation.
  - d. Working levels of work platforms SHALL be fully planked or decked.
  - e. When the scaffold height exceeds four times the minimum scaffold base dimension (and including the width added by outriggers, if used), the scaffold SHALL be secured to the wall or structure.

**18.3.2 Inspection**

- 18.3.2.1 29 CFR 1926.451(f)(3) mandates that scaffold components SHALL be inspected for visible defects by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.

**18.3.3 Erection, Move and Dismantle or Alteration**

- 18.3.3.1 29 CFR 1926.451 (f)(7) mandates that "Scaffolds SHALL be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities SHALL be performed only by experienced and trained employees selected for such work by the competent person."

**18.3.4 Capacities**

- 18.3.4.1 Scaffolds and their components SHALL meet the requirements contained in ANSI A10.8 and be capable of supporting without failure at least four times the maximum anticipated load.
- 18.3.4.2 Scaffold system components that are subjected to a bending moment (such as outrigger beams with suspended scaffold and counterweights) SHALL be capable of providing a resisting moment of at least four times the tipping moment.
- 18.3.5** Planking
  - 18.3.5.1 All planking of platforms SHALL be either, overlapped a minimum of 12 inches, or secured from movement.
  - 18.3.5.2 Scaffold planks SHALL extend over their end supports not less than six (6) inches (unless the planking is manufactured with restraining hooks or equivalent means) to no more than 12 inches.
  - 18.3.5.3 Planking on scaffolds SHALL extend from the toe board to not more than 14 inches from the face of the building or structure unless standard guardrails are installed or personal fall protection systems are used. The maximum distance for outrigger scaffolds SHALL be three (3) inches.
  - 18.3.5.4 Planking SHALL be supported or braced to prevent excessive spring or deflection and secured and supported to prevent loosening, tipping, or displacement.
  - 18.3.5.5 When a scaffold materially changes its direction, the platform planks SHALL be laid to prevent tipping.
    - a. The planks that meet the corner bearer at an angle SHALL be laid first, and extend over the diagonally placed bearer far enough to have a good safe bearing but not far enough to involve any danger from tipping, and;
    - b. The planking running in the opposite direction at an angle SHALL be laid so as to extend over and rest on the first layer of planking.
  - 18.3.5.6 Work platforms SHALL be securely fastened to the scaffold.
- 18.3.6** Fall protection SHALL be utilized when working from scaffolding or platforms at a height six (6) feet or greater.

**18.3.7** Access

18.3.7.1 An access ladder or equivalent safe access SHALL be provided.

18.3.7.2 Climbing of braces SHALL be prohibited.

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**19. WORK AREA PROTECTION**

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**19.1. Temporary Traffic Control (TTC) Zones General**

**19.1.1** Many times in performing our jobs we have situations where we not only have a moral obligation to protect vehicles and pedestrians from a potentially hazardous condition we may be creating, but also a legal obligation. It should also be mentioned that some cities, townships, and counties have their own version of what protection should be given, so additional means and methods of protection may have to be used in these cases.

**19.1.2** Work site traffic control is needed to handle situations caused by:

19.1.2.1 Construction

19.1.2.2 Minor maintenance

19.1.2.3 Utility operations

**19.1.3** Traffic control systems are used at work sites to protect:

19.1.3.1 Work Force

19.1.3.2 Motorist

19.1.3.3 Pedestrian

19.1.3.4 Equipment

19.1.3.5 Facility

**19.1.4** Traffic control zones are established to regulate, warn, and guide motorists and pedestrians through or around the work area safely and efficiently.

**19.1.5** Work sites create potential hazards because they:

- 19.1.5.1 Confront motorists and pedestrians with situations which they normally do not expect, cannot anticipate, and often find confusing.
- 19.1.5.2 Tend to create hazards that the road user can encounter.
- 19.1.5.3 Tend to divert the motorist's attention from the driving task.
- 19.1.5.4 Tend to expose workers to traffic flow.
- 19.1.6** Typical problems found with traffic control systems:
  - 19.1.6.1 Insufficient advance warning – inadequate and inappropriate signs and messages, insufficient sight distance, confusing messages.
  - 19.1.6.2 Inadequate guidance through the work zone – lack of delineation; poorly placed devices; conflicting markings.
  - 19.1.6.3 Poor work supervision and work area housekeeping – conflicts created by workers, materials, and equipment; debris, mud or water in pavement; dirty signs and channelizing devices; warning lights and other electronic devices not functioning.
  - 19.1.6.4 Distractions to motorists – confusing signs or too many signs; conflicting pavement markings; motorist distracted by the operation.

*Refer to the Manual on Uniform Traffic Control Devices (MUTCD), published by the U.S. Department of Transportation, Federal Highway Administration for more traffic control set-up design information.*

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## **19.2. Sections of a TTC Zone**

- 19.2.1** Most TTC zones can be divided into four sections:
  - 19.2.1.1 Advance Warning Area
  - 19.2.1.2 Transition Area
  - 19.2.1.3 Activity Area
  - 19.2.1.4 Termination Area

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**19.3. Traffic Control Devices**

**19.3.1** Traffic control devices are identified as primary devices or secondary devices. Primary devices consist of the following:

19.3.1.1 Signs

19.3.1.2 Channelizing devices

**19.3.2** Secondary devices consist of the following:

19.3.2.1 Message board

19.3.2.2 Arrow board

19.3.2.3 Lights

19.3.2.4 Flag persons

**19.3.3** Signs and channelizing devices are used in numbers and configurations depending upon five factors:

19.3.3.1 The posted speed limit of the highway.

19.3.3.2 The width of the road and number of lanes.

19.3.3.3 The location of the work area in relation to the center of the highway, and the length of the work area.

19.3.3.4 The visibility of the work area.

19.3.3.5 The length of time or duration of the job.

**19.3.4** Signs

19.3.4.1 Signs are extremely versatile devices that generally provide the driver with the greatest amount of information about what lies ahead.

19.3.4.2 Design considerations when using signs:

- a. Target value – target value is the ability of a device to be seen.
- b. Priority value – a sign achieves priority value when it is placed in such a manner that it is observed before other devices.
- c. Visibility – visibility is important in the “acquisition” of information by the approaching motorist.

- d. Legibility – legibility refers to the ability of the driver to discern the intended work or symbol.
- e. Illumination – all signs that are used during the hours of darkness SHALL be retroreflectorized or illuminated. Retroreflective materials send light back into the direction of the source, even though the sign is angled with respect to the light source.

19.3.4.3 Positioning of signs:

- a. Signs should be positioned in accordance with the following principles:
  - Located where they will be seen effectively.
  - Placed so that the driver will have time to respond.
  - General rule is to place signs on the right-hand side of the road.
  - On roadways with two or more lanes in one direction, signs may be placed on the left side also, if possible.

*Table 5: Suggested Advance Warning Sign Spacing*

Road Type	Speed	Distance Between Signs		
		A	B	C
Urban (low speed)	< 30 MPH	200	200	200
Urban (high speed)	35-45 MPH	350	350	350
Rural	50-55 MPH	500	500	500
Expressway/Freeway	60+ MPH	1,000	1,600	2,600
<p>Speed category to be determined by State highway agency in cooperation with local jurisdictions.</p> <p>"A" dimension refers to the sign nearest the beginning point of the taper or the lane restriction.</p> <p>"B" is for the next sign upstream measured from the first sign.</p> <p>"C" dimension is for the first sign the motorist encounters in a typical three sign series, and is measured from the second sign. The initial warning sign - Sign "C" - is the first warning device that the on-coming vehicle approaches. Its placement is the first step in signing off the work area and its removal is the last step when leaving the work area.</p>				

**19.3.5 Sidewalk Closures**

- 19.3.5.1 If work requires the closure of sidewalk, proper signage and Type 1 barricades SHALL be utilized to alert pedestrians well in advance of a work area.
- 19.3.5.2 If sidewalk must remain closed at night, Type A warning lights SHALL be installed.
- 19.3.5.3 During sidewalk closures, considerations SHALL be discussed as to the impact on disabled pedestrians and required provisions made.

**19.3.6 Channelizing Devices**

- 19.3.6.1 Channelizing devices are used to guide motorists through a site, to delineate hazardous conditions, and to visually separate the travel path from the work area.
- 19.3.6.2 Channelizing devices consist of the following:
  - a. Cones
  - b. Drums
  - c. Barricades
- 19.3.6.3 Channelizing devices have two distinct purposes:
  - a. In a taper, they help force movement of traffic from one lane to another or from one position on the roadway to another.
  - b. In delineation, they provide visual guidance to the motorist to assist in identifying the lateral limits of travel.
- 19.3.6.4 Barricades
  - a. “Right” barricades have stripes that slope from the upper right to the lower left.
  - b. “Left” barricades have stripes that slope from the upper left to the lower right.
  - c. Stripes should slope downward in the direction you want traffic to flow.
  - d. There are three types of barricades, 1, 2, and 3; Type 1 being the smallest.
  - e. Jersey barriers should be used for long-term projects where traffic may be a hazard to workers.

**19.3.7 Channelizing Traffic**

19.3.7.1 The following table can be used to determine the length of taper, number of channelizing devices, and channelizing device spacing required to channel traffic, unless State or Local laws dictate differently.

*Table 6: Recommended Taper Length and Device Spacing and Number for Tapers*

SPEED LIMIT	MINIMUM Taper Length (L)			MINIMUM Number of Devices			MAXIMUM DEVICE Spacing in Feet	
	Lane Width in Feet			Lane Width in Feet			Along	After
MPH	10	11	12	10	11	12	Taper	Taper
20	70	75	80	5	5	5	20	40
25	105	115	125	6	6	6	25	50
30	150	165	180	6	7	7	30	60
35	205	225	245	7	8	8	35	70
40	270	295	320	8	9	9	40	80
45	450	495	540	11	12	13	45	90
50	500	550	600	11	12	13	50	100
50	550	605	660	11	12	13	55	100

---

**19.4. Flag Person**

19.4.1 Flag persons or other appropriate traffic controls must be used whenever there is any doubt that effective protection cannot be provided by the usage of signs, signals, and barricades.

*Refer to Figure 4: Flag Person Signals Diagram for more information.*

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19.4.2 Flag persons SHALL wear an approved high visibility garment with retro-reflective material regardless of time of day.

*Note: Many states have stipulations on the color vest a flag person wears. Check state and local laws to ensure*



*proper color selection for the area in which you will be working.*

---

- 19.4.3** Flag persons SHALL use 24-inch stop and slow paddles mounted on a staff with a minimum height of six (6) feet.
- 19.4.4** Flag persons must place themselves in a protected position to reduce possibility of injury from traffic. Staying out of the road and on the shoulder of the road is the preferred flagging position.
- 19.4.5** Flag persons must insure they can fully observe the operation and SHALL guide vehicular traffic in such a manner as to minimize the possibility of incidents or injury.
- 19.4.6** When flag persons are used at both ends of a job site, reliable communications or prearranged signals should be used to insure proper traffic flow.
- 19.4.7** Flag person must face traffic when giving signals.
- 19.4.8** The flag person should give positive, direct signals that leave no doubt as to their meaning.
- 19.4.9** If possible the flag person should advise motorists of the reason for and time of delay. Every effort should be made on the part of the flag person and the workmen to allow the motoring public the right of way.
- 19.4.10** Flag person stations should be far enough in advance of the work area so traffic will have sufficient time to respond to the flag person's signals. This distance is related to the approach speed and site conditions, 200 - 300 feet.
- 19.4.11** Nighttime flagging requires proper illumination of flag person and equipment. A well-lighted flagging station and/or a reflectorized paddle sign plus a flashlight, lantern, or other lighted signal that will display a red warning light SHALL be used.
- 19.4.12** A flag person must be alert at all times.
- 19.4.13** DO NOT STAND DIRECTLY IN THE PATH OF AN ONCOMING VEHICLE.
- 19.4.14** Always stand alone so drivers don't get confused.

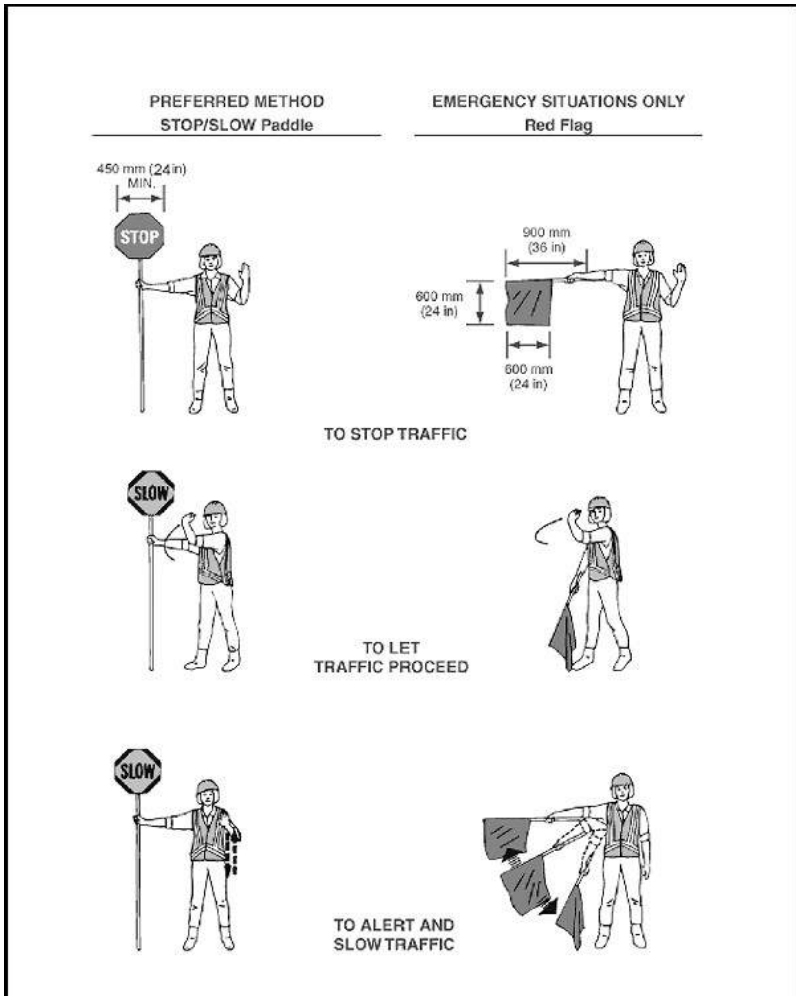
- 19.4.15** When two flag persons are working together they must be able to communicate by hand signals or two way radios. One flag person should be in charge and the other coordinate his or her activities accordingly.
- 19.4.16** When you are flagging by yourself:
  - 19.4.16.1 Operate from the road shoulder;
  - 19.4.16.2 Operate in a highly visible position, opposite the work.
- 19.4.17** ADVANCE FLAG PERSON signs must be used when work is being done on a blind corner or places where there is limited sight (fog, smoke); and also in highly congested areas where the distance between the first vehicle and the last is great.
- 19.4.18** As an advance flag person you should stop each vehicle and advise the driver of the work ahead; be prepared to give instructions on alternative routes if they are possible.
- 19.4.19** **NEVER** LEAVE YOUR POST unless to avoid being struck by a vehicle.

---

**19.5. Signals and Sign Placement Diagrams**

- 19.5.1** Flag person qualifications:
  - 19.5.1.1 Sense of responsibility.
  - 19.5.1.2 Training in safe traffic control practices before permitted to perform flagging procedures.
  - 19.5.1.3 Good physical condition.

Figure 4: Flag Person Signal Diagram



*Note: Safety glasses and gloves are also required.*

*Table 7: Distances of Flagger Station in Advance of the Work Space in MPH/Feet.*

Speed (MPH)	Distance in Feet
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485
























*Table 8: Distances of Flagger Station in Advance of the Work Space in kM/H and Meters*

Speed (kM/H)	Distance in Meters
30	10
40	15
50	30
60	45
70	65
80	85
90	110
100	135
110	170
120	205

Figure 5: Meaning of Symbols on Typical Application Diagrams

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**Table 6H-2. Meaning of Symbols on Typical Application Diagrams**

	Arrow board		Shadow vehicle
	Arrow board support or trailer (shown facing down)		Sign (shown facing left)
	Changeable message sign or support trailer		Surveyor
	Channelizing device		Temporary barrier
	Crash cushion		Temporary barrier with warning light
	Direction of temporary traffic detour		Traffic or pedestrian signal
	Direction of traffic		Truck-mounted attenuator
	Flagger		Type 3 barricade
	High-level warning device (Flag tree)		Warning light
	Longitudinal channelizing device		Work space
	Luminaire		Work vehicle
	Pavement markings that should be removed for a long-term project		

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**19.6. TTC Diagram: Work beyond the Shoulder**

(See Figure 6, facing page.)

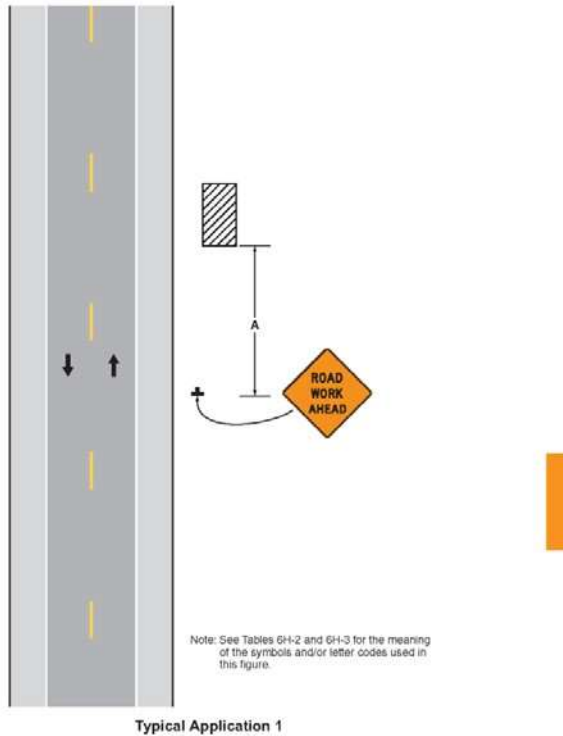
- 19.6.1** The signs illustrated in this figure are not required if the work space is behind a barrier, more than two feet behind the curb, or 15 feet or more from the edge of any roadway.
- 19.6.2** The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
- 19.6.3** If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.
- 19.6.4** For short-term, short-duration, or mobile operation, all signs and channeling devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Figure 6: TTC Diagram: Work beyond the Shoulder

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Figure 6H-1. Work Beyond the Shoulder (TA-1)



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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

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**19.7. TTC Diagram: Short-Duration Mobile Operation on Shoulder**

(See Figure 7, facing page.)

- 19.7.1** In situations where multiple work locations in a limited distance make it practicable to place stationary signs, the maximum spacing for the advance warning sign is five miles in advance of the work.
- 19.7.2** The length of activity area sign may be used as the stationary advance warning sign if the work locations occur over a distance of more than two miles.
- 19.7.3** Warning signs are not required if the work vehicle displays a flashing or revolving yellow light, if the distance between work locations is one mile or more, and if the work vehicle travels at traffic speeds between locations.

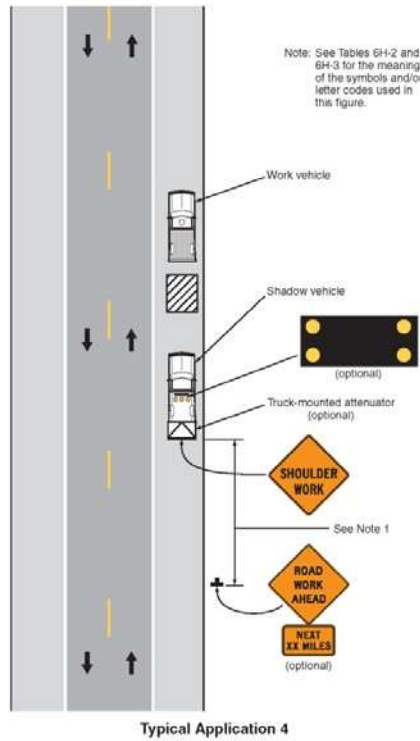


Figure 7: TTC Diagram: Short-Duration Mobile Operation on Shoulder

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Figure 6H-4. Short-Duration or Mobile Operation on a Shoulder (TA-4)



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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

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**19.8. TTC Diagram: Shoulder Work with Minor Encroachment**

(See Figure 8, facing page.)

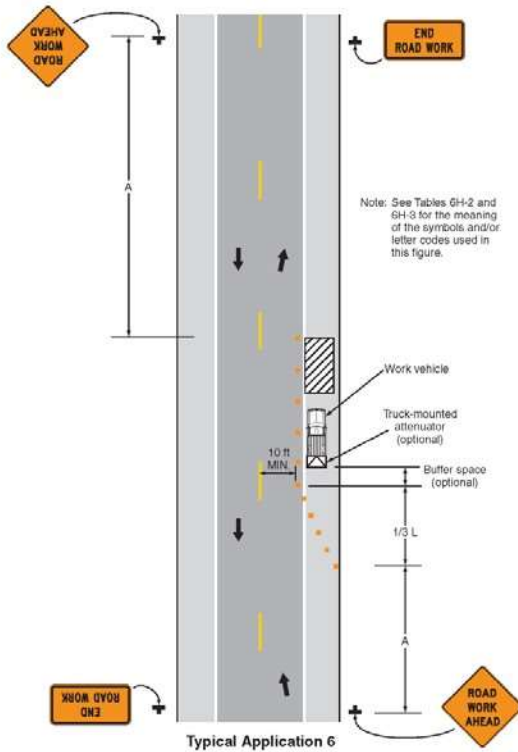
- 19.8.1** The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
- 19.8.2** The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
- 19.8.3** Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channeling devices, provided 10-foot-wide lanes are maintained.
- 19.8.4** Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
- 19.8.5** Portable concrete barriers may be used along the work space.
- 19.8.6** The protection vehicle is optional if taper and channeling devices are used. For short-duration work, the taper and channeling devices are optional if the protection vehicle with an activated flashing yellow light is used.

Figure 8: TTC Diagram, Shoulder Work with Minor Encroachment

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Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)



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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

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**19.9. TTC Diagram: Lane Closure on Two-Lane Road Using Flag Persons**

(See Figure 9, facing page.)

- 19.9.1** Floodlights should be provided to mark flag person stations at night as needed.
- 19.9.2** For low-volume applications, a single flag person may be adequate. Where one flag person can be used, such as for short work area on straight roadways, the flag person must be visible to approaching traffic from both directions.
- 19.9.3** Channeling devices are to be extended to a point where they are visible to approaching traffic.
- 19.9.4** The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
- 19.9.5** Flashing warning lights and/or flags may be used to call attention to the advanced warning signs.

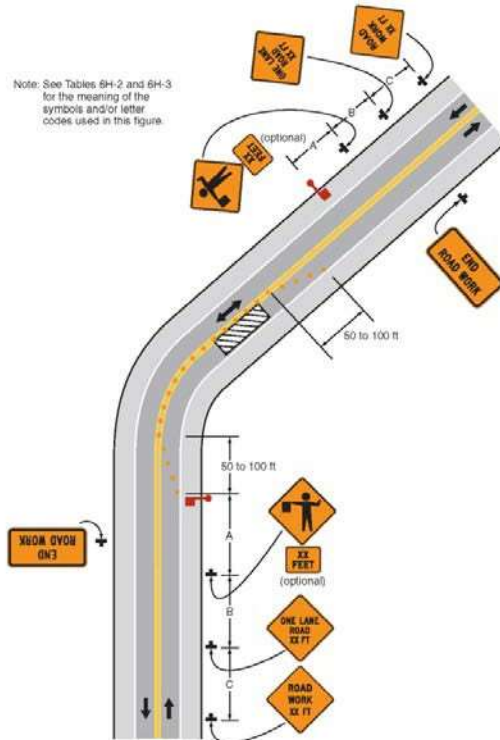
Figure 9: TTC Diagram, Lane Closure on Two-Lane Road Using Flag Persons

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Figure 6H-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)

Note: See Tables 6H-2 and 6H-3 for the meaning of the symbols and/or letter codes used in this figure.



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Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.

Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.

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**19.10. TTC Diagram: Lane Closure on Low-Volume, Two-Lane Road**

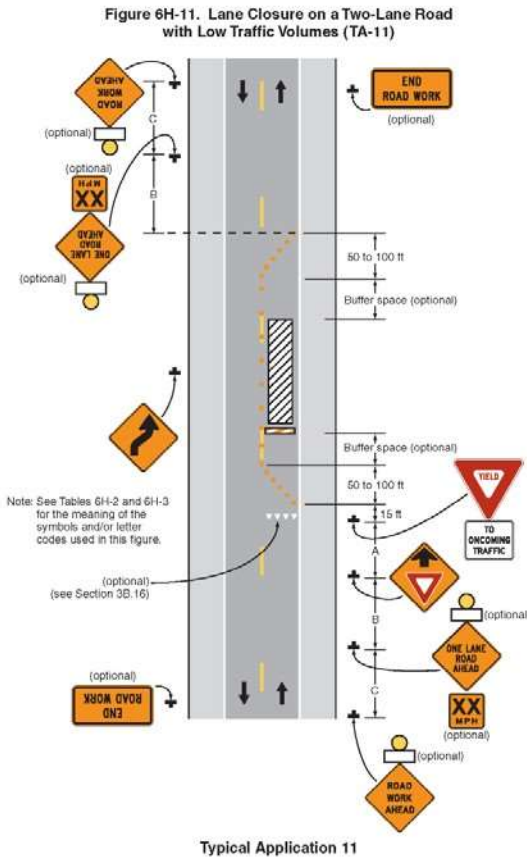
(See Figure 10, facing page.)

- 19.10.1** This temporary traffic control zone traffic control application maybe used as an alternate traffic control plan to the lane closure with flag persons (Figure TA-10), when the following conditions exist.
- 19.10.2** Traffic volume is such that sufficient gaps exist for traffic that must yield.
- 19.10.3** Drivers from both directions must be able to see approaching traffic through and beyond the worksite.
- 19.10.3.1 The YIELD signs and YIELD AHEAD signs may be covered and flag persons used, as needed, during daylight working hours to control the flow of traffic through the work space. When flag persons are used, the ADVANCE FLAG PERSON sign SHALL be used in place of the YIELD AHEAD sign.
- 19.10.3.2 The Type A flashing warning lights may be placed on the ROAD WORK AHEAD and the ONE LANE ROAD AHEAD signs, whenever a night lane closure is necessary.

Figure 10: TTC Diagram, Lane Closure on Low-Volume, Two-Lane Road

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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

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**19.11. TTC Diagram: Temporary Road Closure**

(See Figure 11, facing page.)

- 19.11.1** Conditions represented are for work that requires closings during daytime hours only.
- 19.11.2** This application is intended for a planned temporary closing not to exceed 15-20 minutes.
- 19.11.3** The Flag persons SHALL stop the first vehicle from the position shown, then move to the centerline to stop approaching traffic.
- 19.11.4** For high-volume roads, a police patrol car and/or a changeable message sign may be added.
- 19.11.5** A changeable message sign may be used in place of the initial warning sign.

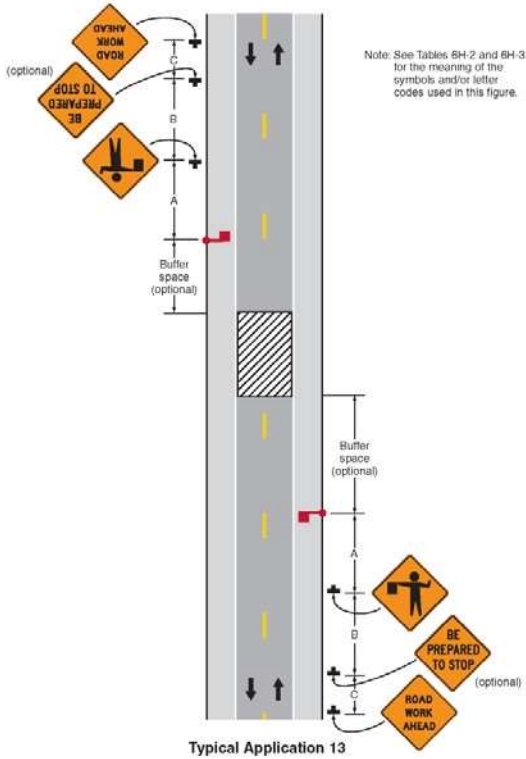


Figure 11:TTC Diagram, Temporary Road Closure

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Figure 6H-13. Temporary Road Closure (TA-13)



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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

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**19.12. TTC Diagram: Lane Closure on Minor Street**

(See Figure 12, facing page.)

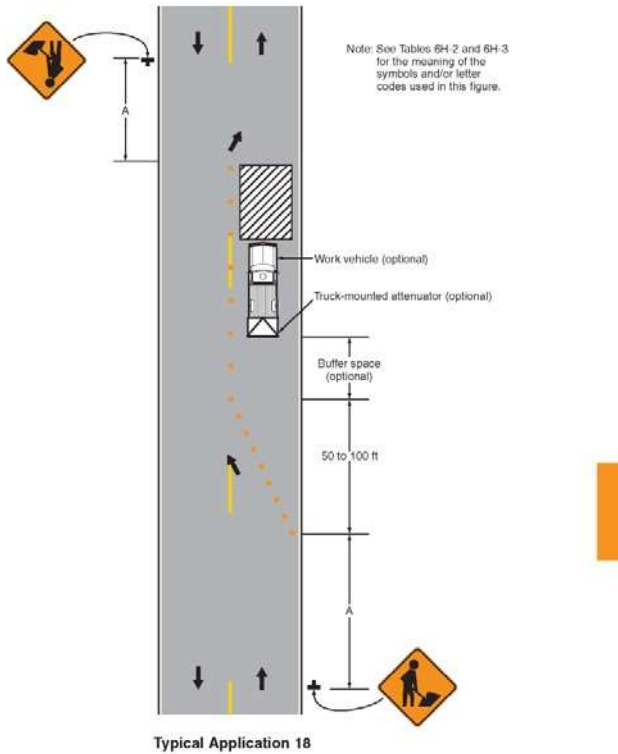
- 19.12.1** The traffic control procedure shown is appropriate only for low-volume, low-speed facilities, such as local residential streets. With few exceptions, this procedure is not to be used in rural areas.
- 19.12.2** Traffic can regulate itself when volumes are low and the length of the work is short, thus enabling drivers to readily see the roadway beyond.
- 19.12.3** Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

Figure 12: TTC Diagram, Lane Closure on Minor Street

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Figure 6H-18. Lane Closure on a Minor Street (TA-18)



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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

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**19.13. TTC Diagram, Double Lane Closure on Freeway**

(See Figure 13, facing page.)

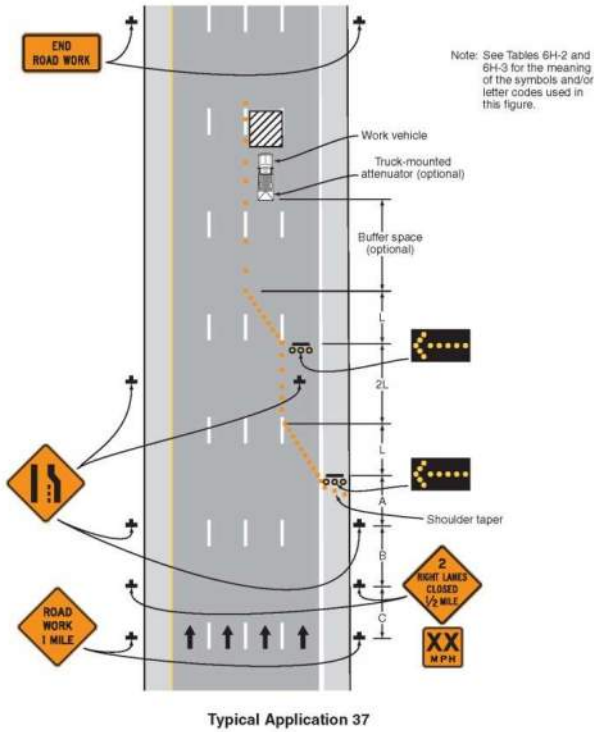
- 19.13.1** Flashing warning lights and/or flags may be used to call attention to the initial warning signs.
- 19.13.2** Ordinarily, the preferred position for the second arrow display is in the closed interior lane at the beginning of the second merging taper. In the following situations, however, the second arrow display should be placed in the closed exterior lane at the end of the second merging taper.
  - 19.13.2.1** When a protection vehicle is used in the interior closed lane and the second arrow display is mounted on the protection vehicle.
  - 19.13.2.2** If alignment or other conditions create any confusion as to which lane is closed by the second arrow display.
  - 19.13.2.3** When the first arrow display is placed in the closed exterior lane at the end of the first merging taper (the alternative position when the shoulder is narrow).

Figure 13: TTC Diagram, Double Lane Closure on Freeway

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Figure 6H-37. Double Lane Closure on a Freeway (TA-37)



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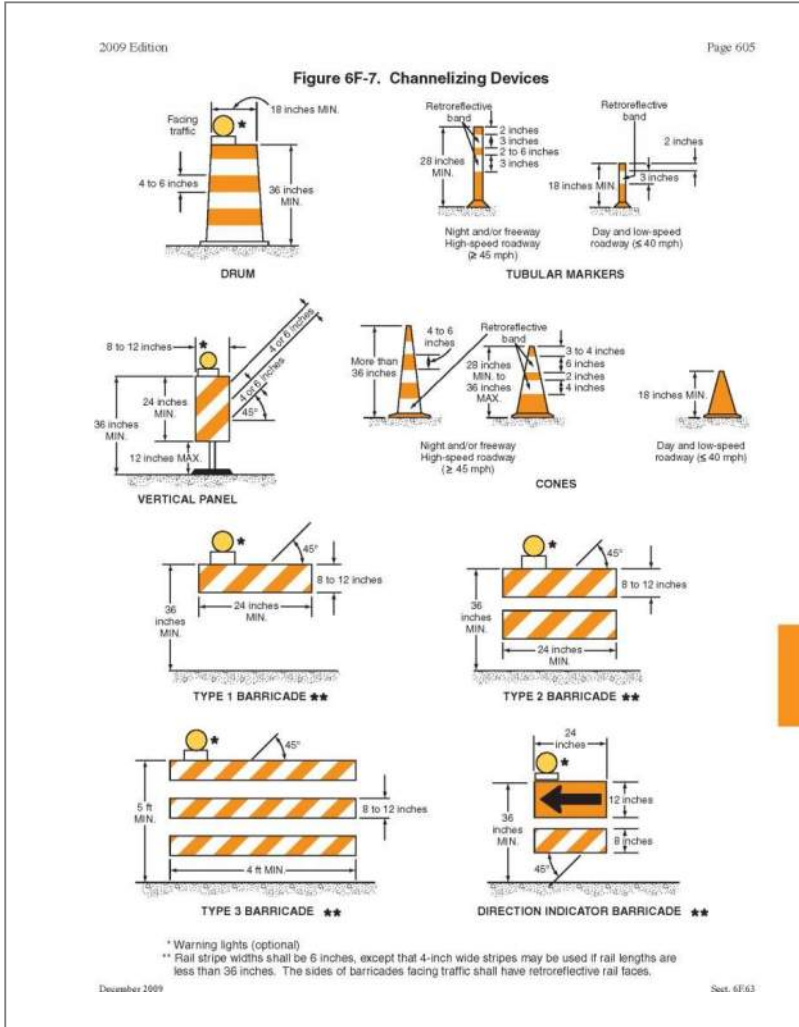
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*Note: See Figure 5, Meaning of Symbols on Typical Application Diagrams for the meaning of the symbols and/or letter codes used in this figure.*

*Note: Diagram is not to SCALE. Cones, signs, etc. need to be spread out much farther than shown.*

**19.14. TTC Channelizing Devices**

Figure 14: TTC Channelizing Devices



**19.14.1** The sides of barricades facing traffic SHALL have retroreflective rail faces.

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## **20.            **CONFINED SPACE****

---

### **20.1.        **Precautions****

**20.1.1**        Before entering any enclosed/confined space, precautions outlined in this section and in the EEC Confined Space Entry Program SHALL be taken to ensure that the space has an adequate supply of oxygen and is free from dangerous gases and other hazards.

---

### **20.2.        **Definitions****

#### **20.2.1**        **Confined Space**

20.2.1.1        A confined space is large enough and so configured that an employee can bodily enter to perform work.

20.2.1.2        Has limited or restricted means for entry or exit.

20.2.1.3        Is not designed for continuous employee occupancy.

20.2.1.4        May have a hazardous atmosphere under normal operating conditions (e.g., tanks, vessels, transformers, and circuit breakers).

#### **20.2.2**        **Enclosed Space**

*Note: Applicable to Electric work ONLY*

---

20.2.2.1        Designed for periodic employee entry under normal operating conditions.

20.2.2.2        Has limited means of egress or entry.

20.2.2.3        Under normal conditions does not contain a hazardous atmosphere, but may under abnormal conditions.

20.2.2.4        Example: underground manholes, vaults, tunnels, and shafts.

## **20.3. Confined Space Classification**

### 20.3.1.1 Non Permit Confined Space (NPCS)

- a. OSHA defines a "non-permit confined space" as a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.
- b. A confined space SHALL be classified as a NPCS when no hazards are detected upon testing of the confined atmosphere, and the confined space does not contain or have the potential to contain any hazards capable of causing death or serious injury.
- c. NPCSS must be evaluated when changes occur in their use or configuration and, where appropriate, must be reclassified as permit spaces.

### 20.3.1.2 Permit Required Confined Space (PRCS)

- a. Before entering a PRCS, consult the EEC Confined Space Entry Program.
- b. Examples of PRCSs are those which:
  - Contains or has the potential to contain a hazardous atmosphere.
  - Contains a material that has the potential for engulfing an entrant.
  - Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls, or by a floor which slopes downward and tapers to a small cross-section.
  - Contains any other recognized serious safety or health hazard.

*Refer to OSHA 29 CFR 1910.146 for more information.*

---



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**20.4. General Procedure**

- 20.4.1** Only trained employees SHALL be permitted to perform work in a confined space.
- 20.4.2** Entry supervisor, entrant, and attendant SHALL be trained and aware of their duties before entering a confined space.

---

**20.5. Requirements before Testing**

**20.5.1** Ignition Sources

- 20.5.1.1** Until test for combustible gas indicates a safe atmosphere, smoking, sparks, and open flames are prohibited.
- 20.5.1.2** All other sources of possible ignition such as trucks, pumps, blowers, etc., SHALL be kept at a reasonable distance from the enclosed/confined space.

**20.5.2** Removing Manhole Cover

- 20.5.2.1** If the manhole cover has a hole suitable for the insertion of the test equipment's sampling hose, the cover SHALL NOT be removed before testing.
- 20.5.2.2** If there is no hole, the cover SHALL be raised only enough to permit insertion of the sampling hose under it. In raising the cover, care SHALL be taken to prevent creation of sparks.
- 20.5.2.3** After manhole cover has been removed, a manhole guard SHALL be put into place.

**20.5.3** Water in the Manhole

- 20.5.3.1** Care SHALL be taken to keep the end of the sampling hose free from water or other liquids while testing, since they will damage the instrument.
- 20.5.3.2** If the manhole must be pumped, the manhole SHALL be retested after the pumping operation.

**20.5.4** Removing Inspection Covers or Access Doors on Electrical Equipment

- 20.5.4.1 When possible, normally sealed equipment SHALL be vented prior to removal of inspection covers or access doors.
- 20.5.4.2 Care SHALL be taken to prevent sparks, and to prevent any liquid from entering the sampling hose.

---

**20.6. Atmospheric Testing before Entry**

- 20.6.1 The operation and testing SHALL be conducted in the following order with approved meters that have been calibrated within the past 30 days.
  - 20.6.1.1 Oxygen content - a test for oxygen content SHALL always be made using an approved test procedure.
  - 20.6.1.2 Combustible gas - a test for combustible gas SHALL always be made using an approved test procedure.
  - 20.6.1.3 Toxic gases - if the presence of other toxic contaminants is suspected, a test SHALL be performed for these toxics.
  - 20.6.1.4 Carbon monoxide - a test for carbon monoxide SHALL be made using an approved test procedure.

*Note: Refer to the operator's manual for additional guidelines regarding frequency of calibration.*

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**20.7. Requirements during Occupancy**

- 20.7.1 Entry into a NPC - when the atmosphere is found acceptable after appropriate tests and no other hazards are present, a worker may enter the enclosed/confined space.

*Note: Additional precautions/actions may be required for entry into a confined space, follow the directions in the EEC Confined Space Entry Program.*

---

- 20.7.2 Use of Rescue and Retrieval Systems

- 20.7.2.1 General work activities - rescue equipment needs to be readily available near the enclosed/confined space. Employees entering the enclosed/confined space are required to wear a full body harness, but would not be required to be attached to a lifeline (tether).
- 20.7.2.2 Potentially hazardous areas - employees entering the enclosed/confined space are required to wear a full body harness and lifeline (tether) attached to the retrieval system located over the enclosed/confined space.
- 20.7.3** Continuous atmospheric testing - the atmosphere SHALL be continuously monitored using approved equipment having an audible alarm.
- 20.7.4** Inspection of enclosed and confined electrical spaces - whenever entering into an enclosed or confined space (e.g., electrical manhole or vault) containing energized electrical facilities the worker SHALL:
- 20.7.4.1 Use the appropriate process to confirm that primary circuit, line fault locating, or “try back” operations are not scheduled to be performed on facilities located in the enclosed or confined space during the time the space will be occupied.
- 20.7.4.2 Inspect the space for:
- a. Exposed conductors and faulted cable, splices, or equipment still energized above 600 volts.
  - b. Abnormally high air or water temperatures (if manhole has water). Transformer manholes and manholes containing secondary cables can be well in excess of 100 degrees Fahrenheit; however, manholes not containing transformers or significant secondary cables should not be generating extremely high temperatures.
  - c. Water entering the space at a rate faster than can be eliminated by pumping.
  - d. Noise emanating from cables, splices, switches, or molded rubber connectors.
  - e. Split, swollen, collapsed, or actively leaking splices, cables, or equipment where the extent of deformity or leakage may be adversely affecting equipment insulating value, proper operation, or cooling capability.

- f. Missing, disconnected, deteriorated, or energized bonding or grounding conductors.
- g. Smoke generated from any piece of equipment.
- h. Deteriorated ceilings where rebar is showing and badly corroded.
- i. Deteriorated or missing sections of walls or decks.
- j. Evidence of acids or corrosive materials that have adversely affected the facilities.
- k. Unshielded energized working primary test caps.
- l. Active combustion, burning, or molten metal.
- m. Mold, fungus, or other organic growth on surfaces or equipment.
- n. Unknown liquids or other materials.
- o. Rodents, snakes, or heavy insect infestation physically present.
- p. Discarded drug-related paraphernalia.
- q. Any identified condition that could reasonably result in worker injury while the space is occupied.

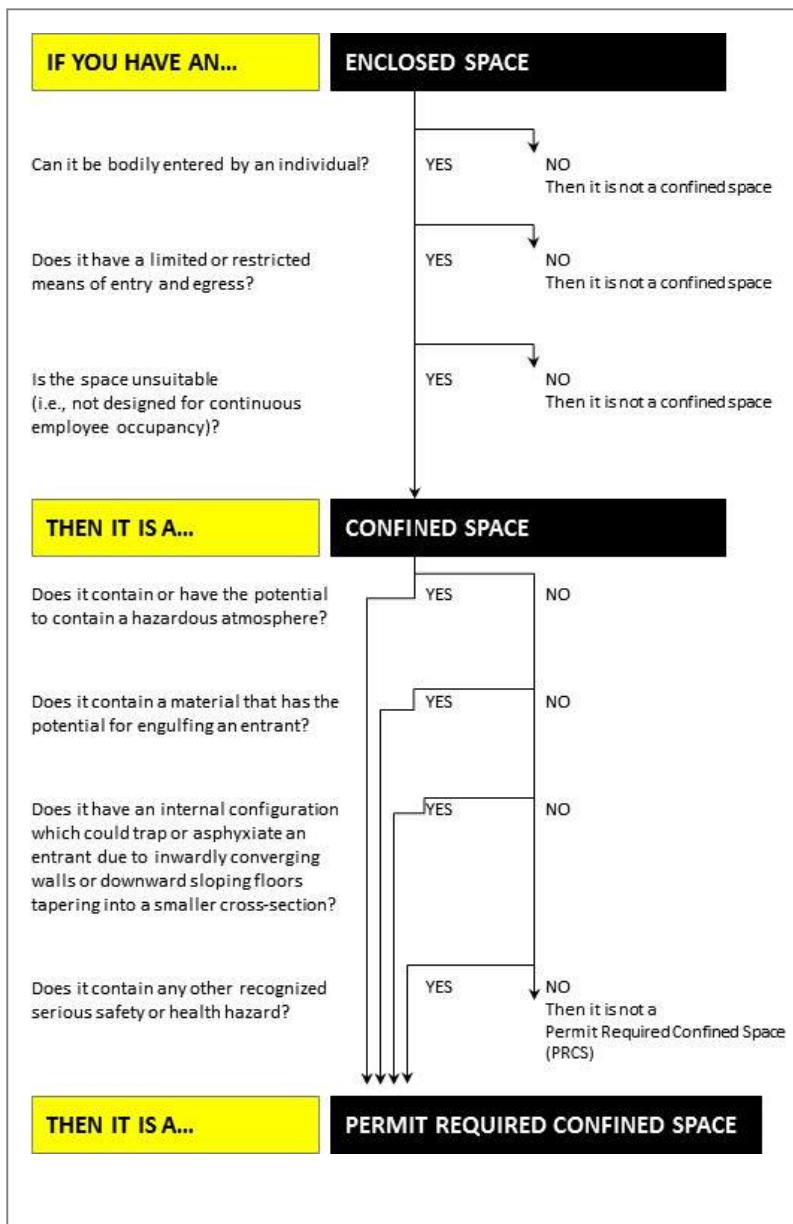
**20.7.5** Initiate appropriate actions or engineering controls to ensure worker safety if any one or more of the items above exist. This action may include exiting the space until remedial actions can be taken.

---

**20.8. Change in Atmosphere**

**20.8.1** If at any time during occupancy, the atmospheric testing equipment indicates an alarm or any other hazard, immediately exit the space, and then secure the space to prevent others from entering.

Figure 17: Confined Spaces Flow Chart



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## 21. EXCAVATION/TRENCHING

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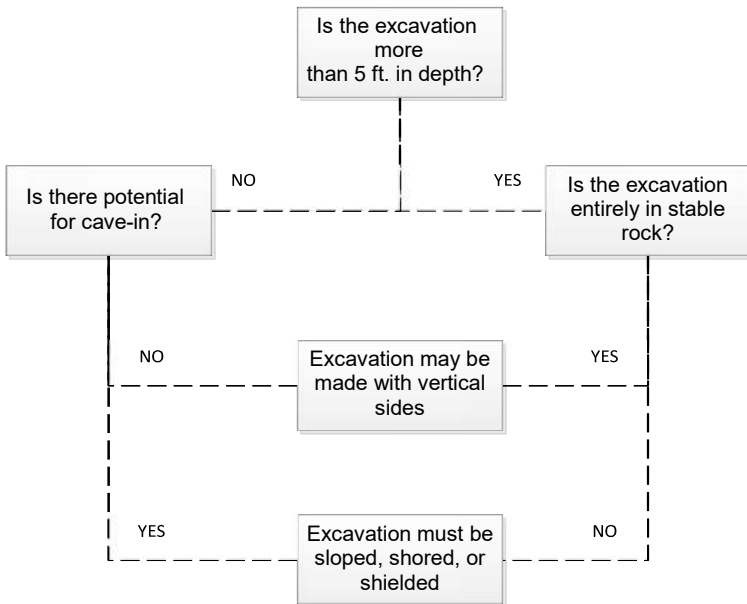
### 21.1. General Requirements

21.1.1 Failure to comply with these requirements may be grounds for immediate termination by any member of management.

21.1.2 All excavations SHALL be made in accordance with the rules, regulations, requirements, and guidelines set forth in 29 CFR 1926.650, .651, and .652; the OSHA Subpart P, Excavations, and EEC Excavation and Trenching Program.

21.1.3 A competent person is one that is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Figure 18: Preliminary Decisions



---

**21.2. Procedures**

- 21.2.1** A competent person SHALL be placed in charge of all excavations.
- 21.2.2** Underground utilities must be located and marked before excavation begins.
- 21.2.3** Employees are not allowed in an unprotected excavation while heavy equipment is digging.

---

**21.3. Inspections**

- 21.3.1** The competent person SHALL conduct inspections:
  - 21.3.1.1 Daily and before the start of each shift.
  - 21.3.1.2 As dictated by the work being done in the trench.
  - 21.3.1.3 After every rain storm.
  - 21.3.1.4 After other events that could increase hazards, such as snowstorm, wind storm, thaw, earthquake, dramatic change in weather, etc.
  - 21.3.1.5 When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.
  - 21.3.1.6 When there is a change in the size, location, or placement of the spoil pile.
  - 21.3.1.7 When there is any indication of change or movement in adjacent structures.

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**21.4. Soil Types**

- 21.4.1** Type A (most stable): clay, silty clay, and hardpan (resists penetration). No soil is Type A if it is fissured, is subject to vibration of any type, has previously been disturbed, or has seeping water.

- 21.4.2** Type B (medium stability): silt, sandy loam, medium clay and unstable dry rock; previously disturbed soils unless otherwise classified as Type C; soils that meet the requirements of Type A soil but are fissured or subject to vibration.
- 21.4.3** Type C (least stable): gravel, loamy sand, soft clay, submerged soil or dense, heavy unstable rock, and soil from which water is freely seeping.
- 21.4.4** Layered geological strata (where soils are configured in layers) – the soil must be classified on the basis of the soil classification of the weakest soil layer. Each layer may be classified individually if a more stable layer lies below a less stable layer, i.e., where a Type C soil rests on top of stable rock.

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**21.5. Testing Methods**

- 21.5.1** The competent person in charge of the excavation SHALL be responsible for determining whether the soil is Type B or C.
- 21.5.2** If the competent person wants to classify the soil as Type C, he or she does not need to do any tests. However, tests must be conducted to determine if the soil can be classified as Type B. To do this, the competent person SHALL use a visual test coupled with one or more manual tests.
- 21.5.2.1** Visual test
- a. The competent person should perform a visual test to evaluate the conditions around the site.
  - b. In a visual test, the entire excavation site is observed, including the soil adjacent to the site and the soil being excavated.
  - c. The competent person also checks for any signs of vibration.



- d. During the visual test, the competent person should check for crack line openings along the failure zone that would indicate tension cracks, look for existing utilities that indicate that the soil has been previously disturbed, and, if so, what sort of backfill was used, and observe the open side of the excavation for indications of layered geologic structuring.
- e. The competent person should also look for signs of bulging, boiling, or sloughing, as well as for signs of surface water seeping from the sides of the excavation or from the water table.
- f. In addition, the competent person should check the area adjacent to the excavation for signs of foundations or other intrusions into the failure zone, and the evaluator should check for surcharging and the spoil distance from the edge of the excavation.

#### 21.5.2.2 Manual tests

- a. Thumb penetration test: attempt to press the thumb firmly into the soil in question. If the thumb penetrates no further than the length of the nail, it is probably Type B soil. If the thumb penetrates the full length of the thumb, it is Type C. It should be noted that the thumb penetration test is the least accurate testing method.
- b. Dry strength test: take a sample of dry soil. If it crumbles freely or with moderate pressure into individual grains it is considered granular (Type C). If dry soil falls into clumps that subsequently break into smaller clumps (and the smaller clumps can only be broken with difficulty) it is probably clay in combination with gravel, sand, or silt (Type B).
- c. Plasticity or wet thread test: take a moist sample of the soil. Mold it into a ball and then attempt to roll it into a thin thread approximately 1/8 inch in diameter by two inches in length. If the soil sample does not break when held by one end, it may be considered Type B.

- d. A pocket penetrometer, shearvane, or torvane may also be used to determine the unconfined compression strength of soils.

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**21.6. Spoils**

- 21.6.1** Temporary spoil SHALL be placed no closer than two feet from the surface edge of the excavation, measured from the nearest base of the spoil pile to the edge of the excavation. This distance should not be measured from the crown of the spoil deposit. This distance requirement ensures that weight of spoils does not increase potential of cave-in.
- 21.6.2** Spoil should be placed so that it channels rainwater and other run-off water away from the excavation. Spoil should be placed so that it cannot incidentally run, slide, or fall back into the excavation.
- 21.6.3** Permanent spoil should be placed at increased distances from the excavation.

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**21.7. Entry and Exit (Ingress and Egress)**

- 21.7.1** Trenches four feet or more in depth SHALL be provided with a means of exit.
- 21.7.2** Spacing between ladders or other means of exit must be such that a worker will not have to travel more than 25 feet laterally to the nearest means of exit.
- 21.7.3** Ladders must be secured and extend a minimum of 36 inches above the landing.
- 21.7.4** Metal ladders should not be used when electric utilities are present.

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**21.8. Exposure to Vehicles**

- 21.8.1** Employees exposed to vehicular traffic SHALL be provided with and required to wear reflective vests or other suitable garments marked with or made of reflectorized or high-visibility materials.
- 21.8.2** Trained flag persons, signs, signals, and barricades SHALL be used when necessary.
- 21.8.3** Employees are not allowed to work under loads being lifted or moved by heavy equipment used for digging or lifting.
- 21.8.4** Employees are required to stand away from equipment that is being loaded or unloaded to avoid being struck by falling materials or spillage.
- 21.8.5** Equipment operators or truck drivers may remain in their equipment during loading and unloading if the equipment is properly equipped with a cab shield or adequate canopy.

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**21.9. Warning Systems for Mobile Equipment**

- 21.9.1** When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system SHALL be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

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**21.10. Hazardous Atmospheres and Confined Spaces**

- 21.10.1** Employees SHALL NOT be permitted to work in hazardous and/or toxic atmospheres. Such atmospheres include those with:
  - a. Less than 19.5% oxygen, more than 23.5% oxygen.
  - b. A combustible gas concentration greater than 20% of the lower flammable limit, and;

- c. Concentrations of hazardous substance that exceed those specified in the Threshold Limit Values for airborne contaminants established by the American Conference of Governmental Industrial Hygienists (ACGIH).

**21.10.2** All operations involving such atmospheres must be conducted in accordance with OSHA requirements for occupational health and environmental controls for PPE and for lifesaving equipment. Engineering controls (such as ventilation) and respiratory equipment may be required.

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**21.11. Standing Water and Water Accumulation**

**21.11.1** Methods for controlling standing water and water accumulation must be provided and should consist of the following if employees must work in the excavation:

- 21.11.1.1 Use of special support or shield systems approved by a registered professional engineer.
- 21.11.1.2 Water removal equipment, such as pumps, used and monitored by competent person.
- 21.11.1.3 Employees removed from the trench during rainstorms.
- 21.11.1.4 Trenches carefully inspected by a competent person after each rain, and before employees are permitted to reenter the trench.

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**21.12. Benching, Sloping, Shoring, and Shielding Requirements**

**21.12.1** All excavations or trenches that show signs of potential cave-in or greater than five feet in depth SHALL be appropriately benched, shored, or sloped according to the procedures and requirements set forth in OSHA Excavation Standard, 29 CFR 1926.650, .651, and .652.

- 21.12.1.1 Excavations or trenches 20 feet deep or greater must have a protective system designed by a registered professional engineer.

- 21.12.1.2 Excavations under the base of footing of a foundation or wall require a support system designed by a registered professional engineer.
- 21.12.1.3 Sidewalks and pavement SHALL NOT be undermined unless a support system or another method of protection is provided to protect employees from their possible collapse.

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**21.13. Benching**

- 21.13.1 There are two basic types of benching, single and multiple, which can be used in conjunction with sloping.
- 21.13.2 In Type B soil, the vertical height of the benches must not exceed four (4) feet. Benches must be below the maximum allowable slope for that soil type. In other words, a 10-foot deep trench in Type B soil must be benched back 10 feet in each direction, with the maximum of a 45-degree angle.
- 21.13.3 Benching is not allowed in Type C soil.

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**21.14. Sloping**

- 21.14.1 Maximum allowable slopes for excavations less than 20 feet based on soil type and angle to the horizontal are as follows:
- 21.14.2 Configurations of sloping and benching systems SHALL be in accordance with Table 9: Maximum Allowable Slopes (below).
- 21.14.3 A 10-foot-deep trench in Type B soil would have to be sloped to a 45-degree angle, or sloped 10 feet back in both directions. Total distance across a 10-foot-deep trench would be 20 feet, plus the width of the bottom of the trench itself. In Type C soil, the trench would be sloped at a 34-degree angle, or 15 feet back in both directions for at least 30 feet across, plus the width of the bottom of the trench itself.

*See illustrations of sloping configurations in A, B, and C Type soils on the following pages.*

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*Table 9: Maximum Allowable Slopes*

MAXIMUM ALLOWABLE SLOPES	
Soil or Rock Type	Maximum Allowable Slopes (H:V)(1)
Stable Rock	Vertical (90 Degrees)
Type A (2)	3/4:1 (53 Degrees)
Type B	1:1 (45 Degrees)
Type C	1-1/2:1 (34 Degrees)
<p>Footnote (1): Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.</p> <p>Footnote (2): A short-term maximum allowable slope of 1/2H:1V (63 degrees) is allowed on excavations in Type A soil that are 12 feet (3.67m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12-feet (3.67m) in depth SHALL be 3/4H:1V (63 degrees).</p> <p>Footnote (3): Sloping or benching for excavations greater than 20 feet deep SHALL be designed by a registered professional engineer.</p>	

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**21.15. Shoring**

- 21.15.1** Shoring or shielding is used when the location or depth of the cut makes sloping back to the maximum allowable slope impractical. There are two basic types of shoring; timber and aluminum hydraulic.
- 21.15.2** All shoring SHALL be installed from the top down and removed from the bottom up. Hydraulic shoring SHALL be checked at least once per shift for leaking hoses and/or cylinders, broken connections, cracked nipples, bent bases, and any other damaged or defective parts.
- 21.15.3** The top cylinder of hydraulic shoring SHALL be no more than 18 inches below the top of the excavation.
- 21.15.3.1** The bottom of the cylinder SHALL be no higher than four feet from the bottom of the excavation. (Two feet of trench wall may be exposed beneath the bottom of the rail or plywood sheeting, if used.)

- 21.15.3.2 Three vertical shores, evenly spaced, must be used to form a system.
- 21.15.3.3 Walers are installed no more than two feet from the top, no more than four feet from the bottom, and no more than four feet apart, vertically.
- 21.15.4 Shielding (Trench Boxes)**
  - 21.15.4.1 Trench boxes are different from shoring because, instead of shoring up or otherwise supporting the trench face, they are intended primarily to protect workers from cave-ins and similar incidents.
  - 21.15.4.2 At least one copy of the tabulated data for each trench box SHALL be maintained at the job site.
  - 21.15.4.3 The excavated area between the outside of the trench box and the face of the trench should be as small as possible. The space between the trench box and the excavation side SHALL be backfilled to prevent lateral movement of the box. Shields may not be subjected to loads exceeding those which the system was designed to withstand.
  - 21.15.4.4 Trench boxes are generally used in open areas, but they also may be used in combination with sloping and benching.
  - 21.15.4.5 The box must extend at least 18 inches above the surrounding area that is sloping toward the excavation. This can be accomplished by providing a benched area adjacent to the box.
  - 21.15.4.6 Any modifications to the shields must be approved by the manufacturer.
  - 21.15.4.7 Shields may ride two feet above the bottom of an excavation, provided they are calculated to support the full depth of the excavation and there is no caving under or behind the shield.
  - 21.15.4.8 Workers must enter and leave the shield in a protected manner, such as by a ladder or ramp.
  - 21.15.4.9 Workers may not remain in the shield while it is being moved.

Figure 19: Excavations Made in Type A Soil

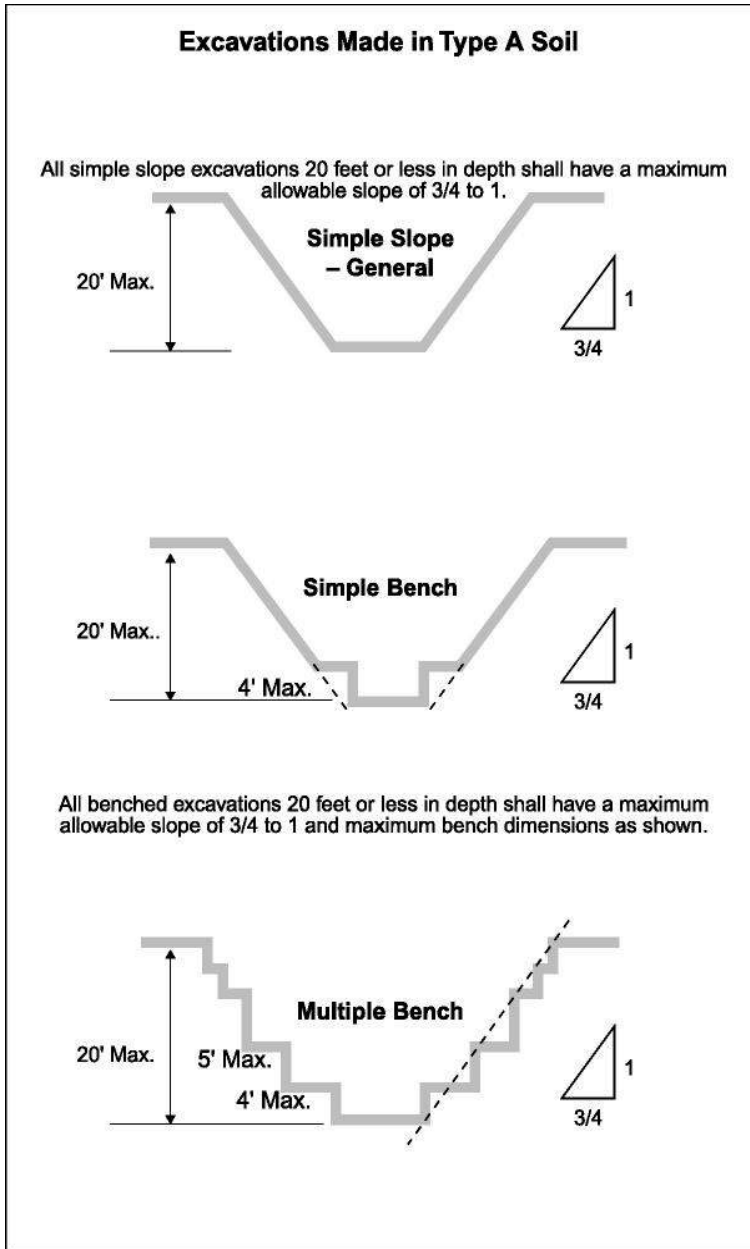




Figure 20: Excavations Made in Type B Soil

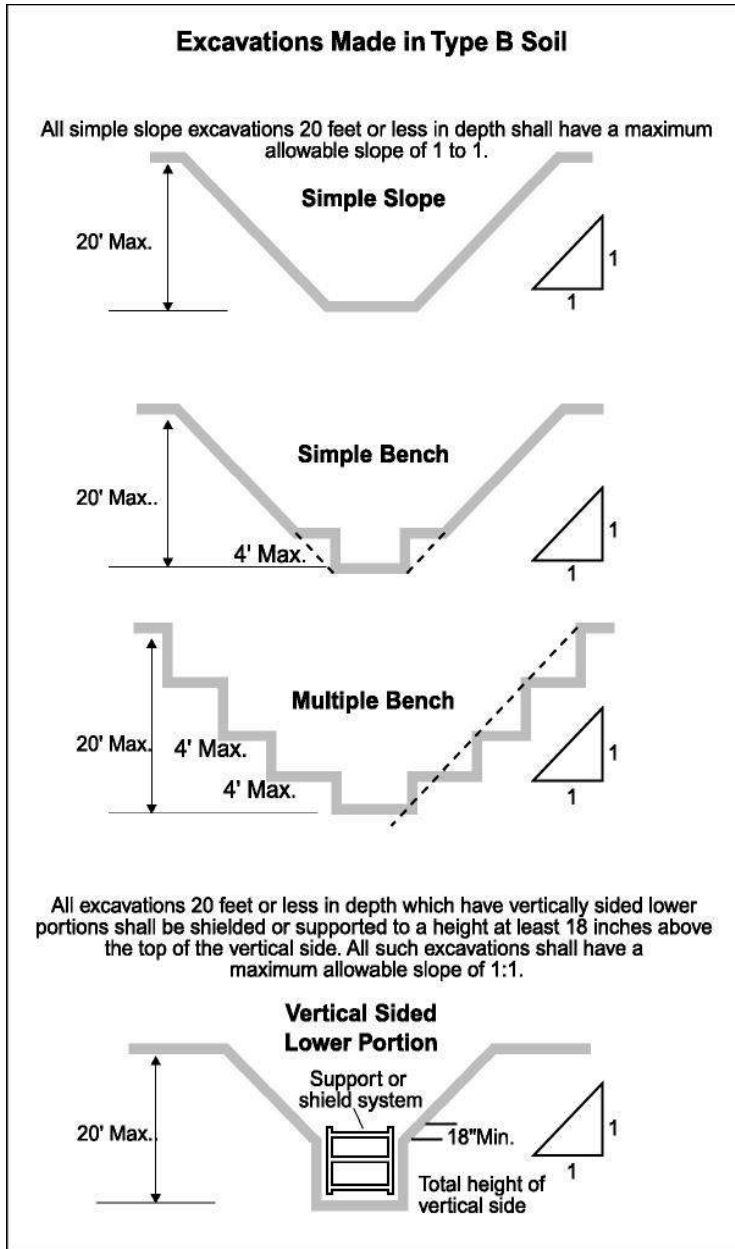
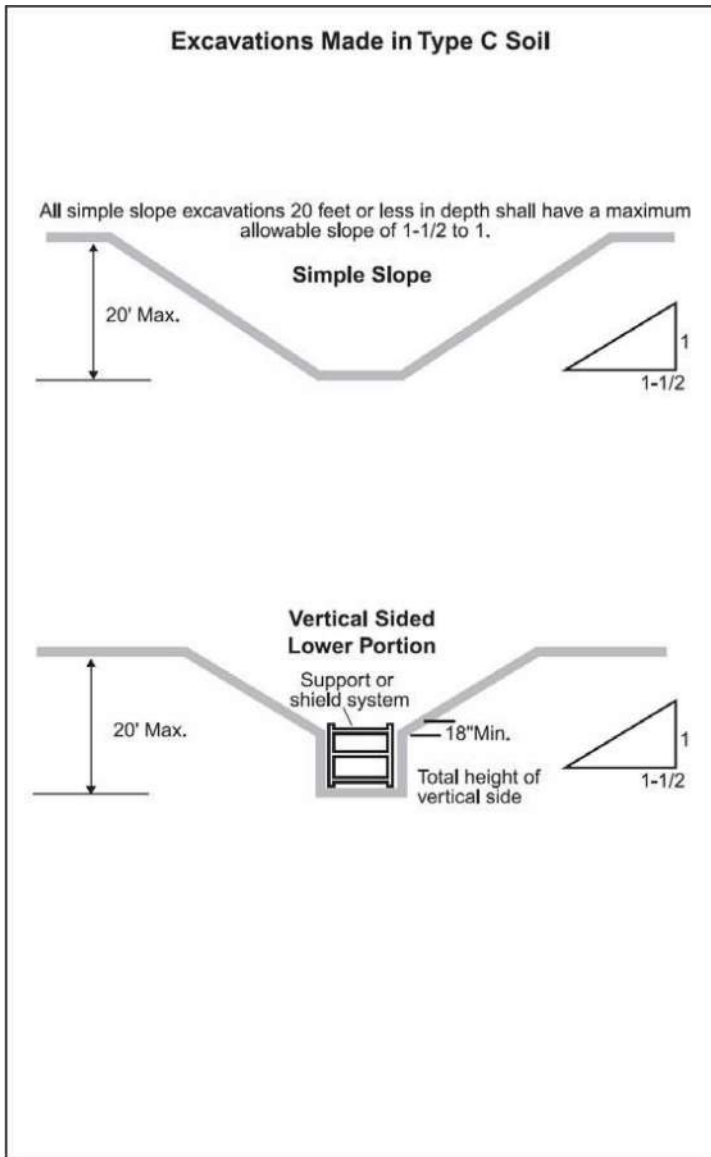


Figure 21: Excavations Made in Type C Soil



**21.15.5 Timber Trench Shoring – Type B Soil**

*Table 10: Timber Trench Shoring - Type B Soil*

Timber Trench Shoring – Minimum Timber Requirements*							
Soil Type B P(a) = 45 x H +72 psf (2 ft. Surcharge)							
DEPTH OF TRENCH (FT.)	SIZE (ACTUAL) AND SPACING OF MEMBERS**						
	CROSSBRACES						
	Horizontal Spacing (ft.)	WIDTH OF TRENCH (FT.)					Vertical Spacing (ft.)
Up to 4		Up to 6	Up to 9	Up to 12	Up to 15		
5 TO 10	Up to 6	4 x 6	4 x 6	6 x 6	6 x 6	6 x 6	5
	Up to 8	6 x 6	6 x 6	6 x 6	6 x 8	6 x 8	5
	Up to 10	6 x 6	6 x 6	6 x 6	6 x 8	6 x 8	5
See Note 1							
10 TO 15	Up to 6	6 x 6	6 x 6	6 x 6	6 x 8	6 x 8	5
	Up to 8	6 x 8	6 x 8	6 x 8	8 x 8	8 x 8	5
	Up to 10	8 x 8	8 x 8	8 x 8	8 x 8	8 x 10	5
See Note 1							
15 TO 20	Up to 6	6 x 8	6 x 8	6 x 8	8 x 8	8 x 8	5
	Up to 8	8 x 8	8 x 8	8 x 8	8 x 8	8 x 10	5
	Up to 10	8 x 10	8 x 10	8 x 10	8 x 10	8 x 10	5
See Note 1							
Over 20	See Note 1						

\*Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\*Manufactured members of equivalent strength may be substituted for wood.  
 Note 1: Member sizes at spacings other than indicated are to be determined as specified in 1926.652(c), Design of Protective Systems.

**21.15.6 Timber Trench Shoring – Type C Soil**

*Table 11: Timber Trench Shoring - Type C Soil*

Timber Trench Shoring – Minimum Timber Requirements*						
Soil Type C P(a) = 80 x H +72 psf (2 ft. Surcharge)						
DEPTH OF TRENCH (FT.)	SIZE (ACTUAL) AND SPACING OF MEMBERS**					
	WHALES			UPRIGHTS		
	SIZE (IN)	VERT. SPACING (FT.)	MAXIMUM ALLOWABLE HORIZ. SPACING (FT.)			
			CLOSE			
5 TO 10	8 x 10	5	2 x 6			
	10 x 12	5	2 x 6			
	12 x 12	5	2 x 6			
	See Note 1					
10 TO 15	10 x 12	5	2 x 6			
	12 x 12	5	2 x 6			
	See Note 1					
	See Note 1					
15 TO 20	12 x 12	5	3 x 6			
	See Note 1					
	See Note 1					
	See Note 1					
Over 20	See Note 1					

\*Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\*Manufactured members of equivalent strength may be substituted for wood.  
 Note 1: Member sizes at spacings other than indicated are to be determined as specified in 1926.652(c), Design of Protective Systems.

**21.15.7 Timber Trench Shoring – Type C Soil**

*Table 12: Timber Trench Shoring - Type C Soil*

Timber Trench Shoring – Minimum Timber Requirements*							
Soil Type C P(a) = 80 x H +72 psf (2 ft. Surcharge)							
DEPTH OF TRENCH (FT.)	SIZE (ACTUAL) AND SPACING OF MEMBERS**						
	CROSSBRACES						
	Horizontal Spacing (ft.)	WIDTH OF TRENCH (FT.)					Vertical Spacing (ft.)
Up to 4		Up to 6	Up to 9	Up to 12	Up to 15		
5 TO 10	Up to 6	6 x 8	6 x 8	6 x 8	8 x 8	8 x 8	5
	Up to 8	8 x 8	8 x 8	8 x 8	8 x 8	8 x 10	5
	Up to 10	8 x 10	8 x 10	8 x 10	8 x 10	10 x 10	5
	See Note 1						
10 TO 15	Up to 6	8 x 8	8 x 8	8 x 8	8 x 8	8 x 10	5
	Up to 8	8 x 10	8 x 10	8 x 10	8 x 10	10 x 10	5
	See Note 1						
	See Note 1						
15 TO 20	Up to 6	8 x 10	8 x 10	8 x 10	8 x 10	10 x 10	5
	See Note 1						
	See Note 1						
	See Note 1						
Over 20	See Note 1						

\*Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\*Manufactured members of equivalent strength may be substituted for wood.  
 Note 1: Member sizes at spacings other than indicated are to be determined as specified in 1926.652(c), Design of Protective Systems.

**21.15.8 Timber Trench Shoring – Type B Soil**

*Table 13: Timber Trench Shoring - Type B Soil*

Timber Trench Shoring – Minimum Timber Requirements*							
Soil Type B P(a) = 45 x H +72 psf (2 ft. Surcharge)							
DEPTH OF TRENCH (FT.)	SIZE (ACTUAL) AND SPACING OF MEMBERS**						
	WHALES			UPRIGHTS			
	SIZE (IN)	VERTICAL SPACING (FT.)	MAXIMUM ALLOWABLE HORIZ. SPACING (FT.)				
			CLOSE	2	3		
5 TO 10	6 x 8	5			2 x 6		
	8 x 10	5			2 x 6		
	10 x 10	5			2 x 6		
10 TO 15	8 x 8	5			2 x 6		
	10 x 10	5			2 x 6		
	10 x 12	5			2 x 6		
15 TO 20	8 x 10	5	3 x 6				
	10 x 12	5	3 x 6				
	12 x 12	5	3 x 6				
Over 20	See Note 1						

\*Mixed oak or equivalent with a bending strength not less than 850 psi.  
 \*\*Manufactured members of equivalent strength may be substituted for wood.  
 Note 1: Member sizes at spacings other than indicated are to be determined as specified in 1926.652(c), Design of Protective Systems.

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## **22. RIGGING**

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### **22.1. Definition of Rigging**

**22.1.1** The term rigging refers to both of the following:

**22.1.1.1** The hardware and equipment used to safely attach a load to a lifting device.

**22.1.1.2** The art or process of safely attaching a load to a hook by means of adequately rated and properly applied slings and related hardware.

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### **22.2. General Rigging Safety Requirements**

**22.2.1** Employees required to perform rigging operation SHALL have completed company-approved rigging training.

**22.2.2** Only rigging equipment that is in good condition and is not suspect or counterfeit may be used.

**22.2.3** All rigging equipment SHALL be visually inspected by the operator prior to use.

**22.2.4** In addition, shackles, turnbuckles, eyebolts, links, rings, metal clamps, and other similar rigging hardware SHALL be checked before each use.

**22.2.5** All rigging equipment SHALL be protected from physical damage caused by neglect, abuse, or misuse.

**22.2.6** All rigging equipment SHALL be stored and maintained in accordance with the manufacturer's recommendations.

**22.2.7** Slings (e.g., wire rope, synthetic web or rope, metal mesh, and chain) and rigging hooks SHALL:

**22.2.7.1** Be inspected at least annually by a qualified inspector.

- 22.2.7.2 Be labeled for identification purposes with a durable tag (synthetic or metal) permanently affixed to the device. Equipment that is not properly labeled SHALL NOT be used. However, manufacturer-supplied serial numbers or other individualized markings that identify the equipment meet the labeling requirement.
- 22.2.7.3 Defective equipment SHALL be removed from service and destroyed to prevent inadvertent reuse.
- 22.2.8** Examples of conditions that may require rigging hardware to be removed from service include the following:
  - 22.2.8.1 Synthetic slings with:
    - a. Abnormal wear
    - b. Torn stitching
    - c. Visible red threads from the interior of the sling fabric
    - d. Broken or cut fibers
    - e. Discoloration or deterioration
    - f. Evidence of heat damage
  - 22.2.8.2 Wire-rope slings with:
    - a. Kinking, crushing, bird-caging, or other distortions
    - b. Evidence of heat damage
    - c. Cracks, deformation, or worn end attachments
    - d. Broken wires in excess of regulatory requirements
    - e. Hooks opened more than 15% at the throat
    - f. Hooks twisted sideways more than 10° from the plane of the unbent hook
  - 22.2.8.3 Alloy steel chain slings with
    - a. Cracked, bent, or elongated links or components
    - b. Cracked hooks
    - c. Shackles, eye bolts, turnbuckles, or other damaged or deformed components

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**22.3. Rigging a Load with Rigging Equipment**

- 22.3.1** Do the following when rigging a load:
  - 22.3.1.1 Determine the weight of the load. Do not guess.
  - 22.3.1.2 Determine the proper size for slings and components.



- 22.3.2 Do not use manila rope for rigging.
- 22.3.3 Make sure that shackle pins and shouldered eye bolts are installed in accordance with the manufacturer's recommendations.
- 22.3.4 Make sure that ordinary (i.e., shoulderless) eye bolts are threaded in at least 1.5 times the bolt diameter.
- 22.3.5 Use safety hoist rings (i.e., swivel eyes) as a preferred substitute for eye bolts whenever possible.
- 22.3.6 Pad sharp edges to protect slings. Machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
- 22.3.7 Do not use slings, eye bolts, shackles, or hooks that have been cut, welded, or brazed.
- 22.3.8 Determine the center of gravity, and balance the load before moving it. Keep the attachment points of rigging accessories as far above, and as far away, from the center of gravity as possible.

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## 22.4. Chains

- 22.4.1 Inspection
  - a. Most of the causes of chain failures can be detected before failure occurs if the proper inspection procedure is followed.
  - b. A link-by-link inspection should be made to detect the following:
    - Bent links
    - Cracks in weld areas, in shoulders, or in any other section of link
    - Transverse nicks and gouges
    - Corrosion pits
- 22.4.2 Safe practices - in the use of chains, recognized safe practices will do much to prevent failures:
  - 22.4.2.1 Never splice a chain by inserting a bolt between two links.

- 22.4.2.2 Never put a strain on a kinked chain. Take up the slack slowly and see that every link in the chain seats properly.
- 22.4.2.3 Don't use a hammer to force a hook over a chain link.
- 22.4.2.4 Permanent identification tags are usually attached to chain slings by the manufacturer. Tags should never be removed.
- 22.4.2.5 Remember that decreasing the angle between the legs of a chain sling and the horizontal increases the load in the legs. (See variation of working load with lifting angle dimension in this section.)
- 22.4.2.6 Use chain attachments (rings, shackles, couplings, end links) designed for use with the chain to which they are fastened.
- 22.4.2.7 Make certain the load is always properly set in the bowl of the hook. Loading on or toward the point (except in the case of grab hooks or others especially designed for the purpose) overloads the hook and leads to spreading and possible failure.
- 22.4.2.8 Chains not in use should be stored in a suitable rack. Don't let them lie on the ground or floor for extended periods.

22.4.3 Welded Steel Chain Specification

Table 14: Welded Steel Chain Specifications from the National Association of Chain Manufacturers'

NACM WELDED STEEL CHAIN SPECIFICATIONS

NATIONAL ASSOCIATION OF CHAIN MANUFACTURERS  
Welded Steel Chain Specifications  
TABLE I

Grade 30 Proof Coil Chain  
(Not to be used in overhead lifting applications)

Nominal Chain Size		Material Diameter		Working Load Limit (Max.)		Proof Test** (Min.)		Minimum Breaking Force**		Inside Length (Max.)		Inside Width (Min.)	
in	mm	in	mm	lbs	kg	lbs	kN	lbs	kN	in	mm	in	mm
1/8	4.0	0.156	4.0	400	180	800	3.6	1,600	7.2	0.94	23.9	0.25	6.4
3/16	5.5	0.217	5.5	800	365	1,600	7.2	3,200	14.4	0.98	24.8	0.30	7.7
1/4	7.0	0.276	7.0	1,300	580	2,600	11.6	5,200	23.2	1.24	31.5	0.38	9.8
5/16	8.0	0.331	8.4	1,900	860	3,800	16.9	7,600	33.8	1.29	32.8	0.44	11.2
3/8	10.0	0.394	10.0	2,650	1,200	5,300	23.6	10,600	47.2	1.38	35.0	0.55	14.0
7/16	11.9	0.488	11.9	3,700	1,680	7,400	32.9	14,800	65.8	1.64	41.6	0.65	16.6
1/2	13.0	0.512	13.0	4,500	2,030	9,000	40.0	18,000	80.0	1.79	45.5	0.72	18.2
5/8	16.0	0.630	16.0	6,900	3,130	13,800	61.3	27,600	122.6	2.20	56.0	0.79	20.0
3/4	20.0	0.787	20.0	10,600	4,800	21,200	94.3	42,400	188.6	2.76	70.0	0.98	25.0
7/8	22.0	0.866	22.0	12,800	5,810	25,600	114.1	51,200	228.2	3.03	77.0	1.08	27.5
1	26.0	1.020	26.0	17,900	8,140	35,800	159.1	71,600	318.2	3.58	90.9	1.25	31.7

\*\*The Proof Test and Minimum Breaking Force loads shall not be used as criteria for service and design purposes. See Section 3.0.

NATIONAL ASSOCIATION OF CHAIN MANUFACTURERS  
Welded Steel Chain Specifications  
TABLE II

Grade 43 High Test Chain  
(Not to be used in overhead lifting applications)

Nominal Chain Size		Material Diameter		Working Load Limit (Max.)		Proof Test** (Min.)		Minimum Breaking Force**		Inside Length (Max.)		Inside Width (Min.)	
in	mm	in	mm	lbs	kg	lbs	kN	lbs	kN	in	mm	in	mm
1/4	7.0	0.276	7.0	2,600	1,180	3,900	17.3	7,800	34.6	1.24	31.5	0.38	9.8
5/16	8.7	0.343	8.7	3,900	1,770	5,850	26.0	11,700	52.0	1.29	32.8	0.44	11.2
3/8	10.0	0.496	10.3	5,400	2,450	8,100	36.0	16,200	72.0	1.38	35.0	0.55	14.0
7/16	11.9	0.468	11.9	7,200	3,270	10,800	48.0	21,600	96.0	1.64	41.6	0.65	16.6
1/2	13.0	0.531	13.5	9,200	4,170	13,800	61.3	27,600	122.6	1.79	45.5	0.72	18.2
5/8	16.0	0.630	16.0	13,000	5,910	19,500	86.5	39,000	173.0	2.20	56.0	0.79	20.0
3/4	20.0	0.787	20.0	20,200	9,180	30,300	134.7	60,600	269.4	2.76	70.0	0.98	25.0
7/8	22.0	0.866	22.0	24,500	11,140	36,750	163.3	73,500	326.6	3.03	77.0	1.08	27.5

\*\*The Proof Test and Minimum Breaking Force loads shall not be used as criteria for service and design purposes. See Section 3.0.

NATIONAL ASSOCIATION OF CHAIN MANUFACTURERS  
Welded Steel Chain Specifications  
TABLE III

Grade 70 Transport Chain  
(Not to be used in overhead lifting applications)

Nominal Chain Size		Material Diameter		Working Load Limit (Max.)		Proof Test** (Min.)		Minimum Breaking Force**		Inside Length (Max.)		Inside Width (Min.)	
in	mm	in	mm	lbs	kg	lbs	kN	lbs	kN	in	mm	in	mm
1/4	7.0	0.291	7.0	3,150	1,430	6,300	28.0	12,600	56.0	1.24	31.5	0.38	9.8
5/16	8.7	0.343	8.7	4,700	2,130	9,400	41.8	18,800	83.6	1.29	32.8	0.44	11.2
3/8	10.0	0.406	10.3	6,600	2,990	13,200	58.7	26,400	117.4	1.38	35.0	0.55	14.0
7/16	11.9	0.468	11.9	8,750	3,970	17,500	77.8	35,000	155.4	1.64	41.6	0.65	16.6
1/2	13.0	0.531	13.5	11,300	5,130	22,600	100.4	45,200	200.8	1.79	45.5	0.72	18.2
5/8	16.0	0.630	16.0	15,800	7,170	31,600	140.4	63,200	280.8	2.20	56.0	0.79	20.0
3/4	20.0	0.787	20.0	24,700	11,200	49,400	219.6	98,800	439.2	2.76	70.0	0.98	25.0

\*\*The Proof Test and Minimum Breaking Force loads shall not be used as criteria for service and design purposes. See Section 3.0.

Adopted  
April 11, 2010

NACM WELDED STEEL CHAIN SPECIFICATIONS

NATIONAL ASSOCIATION OF CHAIN MANUFACTURERS  
Welded Steel Chain Specifications

TABLE IV  
Grade 80 Alloy Chain  
(For overhead lifting applications, only alloy chain should be used)

Nominal Chain Size		Material Diameter		Working Load Limit (Max.)		Proof Test** (Min.)		Minimum Breaking Force**		Inside Length (Max.)		Inside Width Range	
in	mm	in	mm	lbs	kg	lbs	kN	lbs	kN	in	mm	in	mm
7/32	5.5	0.217	5.5	2,100	970	4,200	19.0	8,400	38.0	0.69	17.6	0.281 - 0.325	7.14 - 8.25
9/32	7.0	0.276	7.0	3,500	1,570	7,000	30.8	14,000	61.6	0.90	22.9	0.375 - 0.430	9.53 - 10.92
5/16	8.0	0.315	8.0	4,500	2,000	9,000	40.3	18,000	80.6	1.04	26.4	0.430 - 0.500	10.92 - 12.70
3/8	10.0	0.394	10.0	7,100	3,200	14,200	63.3	28,400	126.0	1.26	32.0	0.512 - 0.600	13.00 - 15.20
1/2	13.0	0.512	13.0	12,000	5,400	24,000	107.0	48,000	214.0	1.64	41.6	0.688 - 0.788	17.48 - 19.50
5/8	16.0	0.630	16.0	18,100	8,200	36,200	161.0	72,400	322.0	2.02	51.2	0.812 - 0.945	20.63 - 24.00
3/4	20.0	0.787	20.0	28,300	12,600	56,600	252.0	113,200	504.0	2.52	64.0	0.984 - 1.180	25.00 - 30.00
7/8	22.0	0.866	22.0	34,200	15,500	68,400	305.0	136,800	610.0	2.77	70.4	1.080 - 1.300	27.50 - 33.00
1	26.0	1.020	26.0	47,700	21,600	95,400	425.0	190,800	850.0	3.28	83.2	1.280 - 1.540	32.50 - 39.00
1-1/4	32.0	1.260	32.0	72,300	32,800	144,600	644.0	289,200	1,288.0	4.03	102.4	1.580 - 1.890	40.00 - 48.00

\*\*The Proof Test and Minimum Breaking Force loads shall not be used as criteria for service and design purposes. See Section 3.0.

NATIONAL ASSOCIATION OF CHAIN MANUFACTURERS  
Welded Steel Chain Specifications

TABLE V  
Grade 100 Alloy Chain  
(For overhead lifting applications, only alloy chain should be used)

Nominal Chain Size		Material Diameter		Working Load Limit (Max.)		Proof Test** (Min.)		Minimum Breaking Force**		Inside Length (Max.)		Inside Width Range	
in	mm	in	mm	lbs	kg	lbs	kN	lbs	kN	in	mm	in	mm
7/32	5.5	0.217	5.5	2,700	1,220	5,400	23.8	10,800	47.6	0.69	17.6	0.281 - 0.325	7.14 - 8.25
9/32	7.0	0.276	7.0	4,300	1,950	8,600	38.5	17,200	77.0	0.90	22.9	0.375 - 0.430	9.53 - 10.92
5/16	8.0	0.315	8.0	5,700	2,600	11,400	51.0	22,800	102.0	1.04	26.4	0.430 - 0.500	10.92 - 12.70
3/8	10.0	0.394	10.0	8,800	4,000	17,600	79.0	35,200	158.0	1.26	32.0	0.512 - 0.600	13.00 - 15.20
1/2	13.0	0.512	13.0	15,000	6,800	30,000	134.0	60,000	268.0	1.64	41.6	0.688 - 0.788	17.48 - 19.50
5/8	16.0	0.630	16.0	22,600	10,300	45,200	201.0	90,400	402.0	2.02	51.2	0.812 - 0.945	20.63 - 24.00
3/4	20.0	0.787	20.0	35,300	16,000	70,600	315.0	141,200	630.0	2.52	64.0	0.984 - 1.180	25.00 - 30.00
7/8	22.0	0.866	22.0	42,700	19,400	85,400	381.0	170,800	762.0	2.77	70.4	1.080 - 1.300	27.50 - 33.00

\*\*The Proof Test and Minimum Breaking Force loads shall not be used as criteria for service and design purposes. See Section 3.0.

**Table 15: Working Load Limits (WLL); Chain**

SIZE mm (inches)	GRADE 30 proof coil kg/lbs.	GRADE 43 high test kg/lbs.	GRADE 70 transport kg/lbs.	GRADE 80 alloy kg/lbs.	GRADE 100 alloy kg/lbs.
7 (1/4)	580 (1,300)	1,180 (2,600)	1,430 (3,150)	1,570 (3,500)	1,950 (4,300)
8 (5/16)	860 (1,900)	1,770 (3,900)	2,130 (4,700)	2,000 (4,500)	2,600 (5,700)
10 (3/8)	1,200 (2,650)	2,450 (5,400)	2,990 (6,600)	3,200 (7,100)	4,000 (8,800)
11 (7/16)	1,680 (3,700)	3,270 (7,200)	3,970 (8,750)		
13 (1/2)	2,030 (4,500)	4,170 (9,200)	5,130 (11,300)	5,400 (12,000)	6,800 (15,000)
16 (5/8)	3,130 (6,900)	5,910 (13,000)	7,170 (15,800)	8,200 (18,100)	10,300 (22,600)
Chain Mark Examples:					
Example 1	3	4	7	8	10
Example 2	30	43	70	80	100
Example 3	300	430	700	800	1000

## 22.5. Care and Use of Ropes, Slings, and Blocks

- 22.5.1** When removing rope from the coil make sure that it unwinds in a counterclockwise direction. Lay coil down flat with the inside end at the bottom. Pull end of rope up through the center of coil. Always take new rope from the center of coil. After use, coil rope in a clockwise direction. This prevents twists and kinks.
- 22.5.2** Store rope in a dry place and where a free circulation of air is provided. Never store rope near exhaust steam or where it may come in contact with sharp objects.
- 22.5.3** Wet rope should never be stored. Always dry rope properly after wetting to avoid premature loss of rope life and strength.
- 22.5.4** Whenever possible, use dry rope. But if wet rope must be used, use rubber gloves with leather protectors when working near energized lines or equipment.









- 22.5.5** Keep rope away from oil, sand, mud, grit, and also away from acids or surfaces upon which acid has been spilled. These agents will greatly reduce the strength and life of a rope.
- 22.5.6** Inspect rope frequently and do not use if it is worn or shows signs of deterioration.
- 22.5.7** Inspect for broken strands, rot, and excessive wear.
- 22.5.8** All rope ends should be taped, whipped, or woven to prevent unraveling.
- 22.5.9** Make sure all tag lines, hand lines, etc., are properly rolled up and hung up.
- 22.5.9.1** Hand lines SHALL be a minimum of 1/2-inch diameter and have a strength equivalent to 1/2-inch manila or polypropylene equivalent.
- 22.5.9.2** Be sure all tag lines, hand lines, etc., are properly rolled up and hung up.
- 22.5.10** Care should be taken in the selection of the knot for each particular job.
- 22.5.11** Do not use frozen rope.
- 22.5.12** Avoid kinks in rope. Kinks pulled through a block will shear the fibers and weaken the rope.
- 22.5.13** When ropes are used as guys and other supports and are exposed to bad weather, they should be slacked off to prevent overstrain due to shortening from wetting.
- 22.5.14** When moving from one location to another, do not allow rope to drag on the ground or over sharp objects.
- 22.5.15** Use the proper knot for the work at hand. Faulty knots or hitches in rope under strain may cause serious incidents. Leave enough end rope to insure that the knot will not pull out.
- 22.5.16** Avoid sudden jerks when raising or lowering a load.

- 22.5.17** A sharp bend reduces the strength of a rope by putting extra strain on the outer fibers. Do not tie or snub rope to objects of relatively small diameter if rope is to be placed under tension. Select a reasonably smooth rounded surface for this purpose.
- 22.5.18** Never straddle or stand unnecessarily close to rope under tension. Do not stand in the inside angle or in the path of rope being paid-out or under tension.
- 22.5.19** Eyes and splices SHALL be made in accordance with the instructions given by the rope manufacturer to prolong the rope's life and service. Splices are better and stronger than knots for permanent connection, since the best knot reduces the strength of the rope up to 50 percent (50%).
- 22.5.20** Minimum factor of safety for rope SHALL be 5:1.
- 22.5.21** The safe load, as specified by the manufacturer, SHALL NOT be exceeded. Safe working load SHALL be a minimum of 5:1 safety factor.

*Table 16: Rope Comparison Chart*

Characteristic	Sisal	Manila	Nylon	Polyester	Polypropylene	Polyethylene
Relative strength	Least	Low	Greatest	2nd Greatest	Great	Great
Relative weight	Heaviest	Heaviest	Light	Heavy	Lightest	Lightest
Permanent elongation 20% of load		1.5	7.0	2.0	4.5	4.0
Working elasticity, 20% of load		7.0	10.0	5.0	5.0	2.0
Ability to absorb energy	Least	Low	Best	Fine	Good	Good
Mildew resistance	Poor	Poor	Excellent	Excellent	Excellent	Excellent
Acid resistance	Poor	Poor	Fair	Good	Excellent	Excellent
Alkali resistance	Poor	Poor	Excellent	Fair	Excellent	Excellent
Sunlight resistance	Fair	Fair	Good	Best	Poor	Fair
Organic solvent resistance	Good	Fair	Good	Good	Fair	Fair
Shows effect of heat, at melting point	300°F	300°F	350°F 460°F	350°F 482°F	250°F 330°F	230°F 285°F
Specific gravity	1.38	1.38	1.14	1.38	0.91	0.95
Moisture absorption (%)	25.0	25.0	4.5	1.5	0	0
Resistance to abrasion	Fair	Good	Excellent	Best	Fair	Fair
Floatability	None	None	None	None	Indefinitely	Indefinitely

Table 17: Nylon Web Sling Ratings

Working Load Limits - Safety Factor = 5 For: Eye & Eye, Twisted Eye, Triangle Fittings, Choker Fittings						
Web Width (in.)	Single Vertical Hitch	Single Choker Hitch	Single Basket Hitch (Vertical Legs)	2-Leg Bridle Hitch Single Basket Hitch with Legs Inclined		
						
	(lbs)	(lbs)	(lbs)	60° (lbs)	45° (lbs)	30° (lbs)
1	1,000	750	2,000	1,730	1,400	1,000
2	2,000	1,500	4,000	3,460	2,830	2,000
3	3,000	2,250	6,000	5,200	4,250	3,000
4	4,000	3,000	8,000	6,950	5,650	4,000
5	5,000	3,750	10,000	8,660	7,070	5,000
6	6,000	4,500	12,000	10,400	8,500	6,000
7	7,000	5,250	14,000	12,100	9,900	7,000
8	8,000	6,000	16,000	13,850	11,300	8,000
9	9,000	6,750	18,000	15,600	12,700	9,000
10	10,000	7,500	20,000	17,350	14,100	10,000
11	11,000	8,250	22,000	19,100	15,500	11,000
12	12,000	9,000	24,000	20,800	17,000	12,000
				If used with a choker hitch, multiply above values x 3/4.		For double basket hitch, multiply above values x 3/4.
						

Note: For Working Load Limits of endless or grommet slings, multiply above values by 2.

## 22.5.22 Working Load Limit (WLL)

22.5.22.1 The Cordage Institute specifies that the WLL of a rope is determined by dividing the minimum tensile strength by the safety factor. Safety factors range from 5 to 12, 5 being standard non-critical and 12 being critical. The working load is a guideline for rope in good condition used in non-critical applications, and should be reduced where life, limb, or valuable property are involved, or where exceptional shock, sustained loading, severe vibration, etc., may be experienced.



**22.5.23** Tensile Strength/Breaking Strength

22.5.23.1 The terms “tensile strength” or “breaking strength” refers to the measured load required to break a rope in tension.

22.5.23.2 Tensile strength is the average strength of new rope under laboratory conditions. This is determined by wrapping the rope around two large diameter capstans and slowly tensioning the line until it breaks. The manufacturer’s recommended working load is determined by taking the tensile strength and dividing it by a factor that more accurately reflects the maximum load that should be applied to a given rope to assure a comfortable safety margin and longevity of the line.

**22.5.24** Tensile Strength/Breaking Strength Formula

22.5.24.1 Formula: Rope Tensile Strength Divided By Safety Factor Equals Safe Working Load (SWL).

22.5.24.2 EXAMPLES: A polypropylene rope with a tensile strength of 14,000 lbs. will be used to complete a non-critical (SF5) and critical (SF12) application and safe working load will be determined for each:

- a. 14,000 lbs. divided by 5 (non-critical) equals 2,800 lbs. SWL
- b. 14,000 lbs. divided by 12 (critical) equals 1,166 lbs. SWL

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**22.6. Winches and Wire Rope**

**22.6.1** Winches

22.6.1.1 There should be no free-spool winches used on jobs because of the possibility of dropping a load by incidentally putting the winch into free-spool.

22.6.1.2 Any malfunctions noted in any of the winch mechanisms (brakes, clutch gear) and any damage to the winch line must be reported as soon as possible and repaired before the winch is again used.

22.6.1.3 When winches are not in operation, the operator should not leave the controls without first having disengaged the winch.

- 22.6.1.4 The winch itself should be greased periodically, whether it is being used frequently or just occasionally. The winch should be given a visual inspection as often as possible because it is a very important piece of equipment in our line of work.
- 22.6.1.5 The truck operator should be thoroughly familiar with the operation of the truck, the power takeoff, and the winch, and should know the effect of the winch and its load on the truck clutch accelerator pedal, truck transmission, and power takeoff movements.
- 22.6.1.6 Care should be taken when operating a winch that the proper speed of the truck transmission and the direction of winch rotation are selected before releasing the clutch pedal.
- 22.6.1.7 Due to the heavy nature of work done with winches, it is essential that all moving parts be kept thoroughly lubricated. Do not exceed the rated capacity of winch and cable.
- 22.6.2 Winch Lines**
- 22.6.2.1 A winch line must be lubricated regularly to protect it from corrosion and excessive wear. Because wire rope is lubricated, it should be kept away from fire. Even a slight burn will dangerously weaken the rope and render it unsafe for use.
- 22.6.2.2 Wire ropes should be securely fastened to drums by zinc plugs or suitable clamps. No less than three clamps should be used. At least three turns should remain on the drum at all times.
- 22.6.2.3 The winch line, after use, should be replaced on the drum in even layers so that in no instance is the line crossed or bunched. If this happens your line will be crushed and flattened, damaging the strands and making it unsafe for the next job.

- 22.6.2.4 A winch line is only as strong as the eye on the end. Make sure this eye is properly made, and both it and the entire winch cable should be given periodic inspections. Moving winch lines, whether or not under load, should be handled only with gloved hands and even then with extreme caution. At least a distance of three feet SHALL be maintained between a workman's hand on the line and any sheave, block, and the winch drum itself.
- 22.6.2.5 Never attach a wire rope winch cable on a level with or above primary wires to raise or lower equipment on a pole.
- 22.6.2.6 When pulling poles, stumps, trees, or when lifting objects with winch, never depend on rope slings. Use chain or wire cable for this purpose.
- 22.6.2.7 Never use winch cable over sheave or Johnson (headache) bar for raising or lowering a load which should be handled with the derrick.
- 22.6.2.8 When a winch and cable are used for any purpose, the cable must always pass over the sheave.
- 22.6.2.9 All employees should be instructed to stand clear of any cable when it is under strain.
- 22.6.2.10 The truck driver is to take orders from only one person while raising or lowering the derrick and during winch operations.
- 22.6.3 Wire Rope**
- 22.6.3.1 Deterioration of wire ropes is due largely to the following factors, which vary considerably in importance, depending on the conditions of service:
- a. Wear, particularly on the crown or outside wires, from contact with sheaves and drums.
  - b. Corrosion, particularly of the interior wires, indicated by pitting. This condition is difficult to detect and highly dangerous. Wear is accelerated by corrosion.
  - c. Kinks, acquired in improper installation of a new rope, hoisting with slack in the rope, and so forth. A kink cannot be removed without creating a weak place.

- d. Fatigue, indicated by a square break of a wire - a break showing granular structure - and particularly due to excessive bending stresses from sheaves and drums with small radius, whipping, vibrations, pounding, and torsional stresses.
- e. Drying out of lubrication, often hastened by heat and operating pressure.
- f. Overloading, including dynamic overloading, if acceleration and deceleration are factors of importance.
- g. Over-winding, which is drum crushing caused by uncontrolled multiple wrapping.
- h. Mechanical abuse, such as pinching down and cutting wires or dragging ropes.

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## **23. LOCKOUT/TAGOUT**

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### **23.1. General Requirements**

- 23.1.1** The following is a guideline to controlling energy sources by either locking and/or tagging the source. Employees performing these tasks are required to comply with the EEC Lockout/Tagout Program.
- 23.1.2** Only approved and authorized personnel may apply locks or tags or other energy isolating devices to company equipment, machinery, or vehicles. All other affected personnel SHALL be trained in the purpose and application of the procedures.
- 23.1.3** Approved lockout/tagout and application devices SHALL be the only devices used for controlling energy and tagging purposes, and SHALL NOT be used for other purposes.
- 23.1.4** Tagout devices SHALL be constructed and printed so that exposure to weather conditions or wet locations will not cause the tag to deteriorate or cause the tag message to become illegible.
- 23.1.5** All information required on the tag SHALL be properly and legibly entered.

- 23.1.6** If more than one person is required to lockout or tagout equipment or machinery, each person will place their own personal lockout or tagout device on the energy isolating device.
- 23.1.7** When an energy isolating device cannot accept multiple locks or tags, a multiple lockout/tagout device such as a multi-holed hasp SHALL be used.
- 23.1.8** As an alternative to utilizing a multi-holed hasp to lockout a device, a single lock may be used to lockout the equipment or machinery, with the single key to that lock being placed in a lockout box or cabinet which allows the use of multiple locks or tags to secure that cabinet.
- 23.1.8.1** Each employee will then use their own lock or tag to secure the box or cabinet. As each person no longer needs to maintain their lockout protection, that person will remove their lock or tag from the multiple lockout devices or the lockout box or cabinet, whichever is being used.
- 23.1.9** Shift changes SHALL be coordinated by the authorized employee in charge, utilizing the departmental lockout/tagout procedure to ensure the safe exchange of information and control of hazardous energies.
- 23.1.10** In the event work cannot be completed by the end of a shift, and there are no overlapping shifts or direct exchange of information between authorized employees assuming the work, employees SHALL follow approved department procedures to ensure the equipment or machinery is safe and properly secured, and that all required information is documented.
- 23.1.11** In the event an employee leaves the facility without removing his/her lock from equipment or machinery on which work must continue then all efforts must be made to contact that employee to return to work and remove the lock or tag.
- 23.1.11.1** If an authorized employee who applied the lock or tag device is not available to remove it, and cannot be contacted, the lock or tag may only be removed according to the following procedures:

- a. A supervisor and authorized employee, from the same department as the employee whose lock or tag has been applied, SHALL be assembled at the equipment or machinery.
- b. The supervisor will verify that the authorized employee who applied the device is not available.
- c. The supervisor and authorized employee will evaluate the equipment or machinery in question to include the inspection of any energy control device, all affected energy sources (e.g., hydraulic, electrical, chemical, pneumatic, thermal, stored energy, etc.), and any other potential hazards that may result from continuing the maintenance and/or repair, or from restarting that piece of equipment or machinery.
- d. Make all reasonable effort to notify the original authorized employee that their lock or tag has been removed.
- e. Apply, as necessary, any new locks and/ or tags to the equipment, and;
- f. Document the results of this exception procedure and maintain with appropriate lockout/tagout files.

*Note: Additional procedures may be required by individual department.*

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## **23.2. Lockout/Tagout Procedures**

**23.2.1** The authorized employee SHALL know the type and magnitude of energy sources that the machine or equipment utilizes and SHALL understand the hazards and the appropriate means to eliminate the hazard.

**23.2.2** If the machine or equipment to be serviced is operating, it should be shutdown using normal shutdown procedures.

- 23.2.3** Operate the disconnect switch, line valve, or other isolation devices so that the equipment is isolated from its energy source(s). Always trace all lines of supply back to their source to assure that there are no added splices, connections, or “tees” that have not been secured. Stored energy in springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam or water pressure, etc., must be dissipated or restrained by methods such as repositioning, blocking, bleeding down, etc.
- 23.2.4** The authorized employee SHALL lockout and/or tagout the energy isolating devices with assigned individual locks and/or tags.
- 23.2.5** Any time a lock is used to secure an energy source, it must be accompanied by a tag identifying the person that installed it, the date and time it was installed, and a means by which the employee may be contacted.
- 23.2.6** At no time will the locking device be removed by anyone other than the person who is identified on the tag unless following specific departmental procedures.
- 23.2.7** After ensuring that no personnel are exposed, as a check on having disconnected the proper energy sources, operate the push button or other normal operating controls to make certain the equipment will not operate.
- 23.2.8** If the equipment, machinery, or vehicle being serviced or repaired has stored energy which cannot be realistically removed by dissipation, bleeding down, or restraining against movement, verification of isolation SHALL be continued until the servicing or maintenance is completed.
- 23.2.9** The equipment or machine is now locked or tagged out-of-service and maintenance or repairs may begin.

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**23.3. Termination of Lockout/Tagout**

- 23.3.1** After the service and/or maintenance is complete and the equipment is ready to be tested and/or returned to normal operation, it must be inspected for completeness of assembly, the area around the machine or equipment must be checked to ensure that exposures to hazards or risks are minimal, and that all non-essential items have been removed from the operating area.
- 23.3.2** All equipment guards must be in place and properly adjusted.
- 23.3.3** All affected employees must be notified of the intention to energize and test the machine or equipment. All non-essential personnel will move to a safe location.
- 23.3.4** The authorized employee(s) who applied any lock or tag SHALL remove all lockout or tagout devices and operate the energy isolating devices to restore energy to the machine or equipment in the exact reverse order that they were installed.
- 23.3.5** Do not remove the last lock or tag until all hazards have been considered and corrected as needed.

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**24. FALL PROTECTION**

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**24.1. Introduction**

- 24.1.1** This section sets forth requirements for employers to provide fall protection systems. Each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge, which is six feet (1.8 meters) or more above a lower level, SHALL be protected from falling by the use of guardrail systems, safety net systems, or personal fall arrest systems.

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**24.2. Duty to Have Fall Protection**

- 24.2.1** Excavations



- 24.2.1.1 Each employee at the edge of an excavation six feet (1.8 meters) or more deep SHALL be protected from falling by guardrail systems, fences, or barricades when excavations cannot be readily seen because of plant growth or other visual obstruction.
- 24.2.1.2 Where walkways are provided to permit employees to crossover excavations, guardrails are required on the walkway if it is 6 feet (1.8 meters) or more above the bottom of the excavation.
- 24.2.2** Precast Concrete Erection
  - 24.2.2.1 Each employee engaged in the erection of pre-cast concrete members (including, but not limited to, the erection of wall panels, columns, beams, and floor and roof “tees”) and related operations, such as grouting of precast concrete members, who is six feet (1.8 meters) or more above lower levels, SHALL be protected from falling by guardrail systems, safety net systems, or personal fall arrest systems.
- 24.2.3** Formwork and Reinforcing Steel
  - 24.2.3.1 Each employee on the face of framework or reinforcing steel SHALL be protected from falling six feet or more by personal fall arrest systems, safety net systems, or positioning device systems.
  - 24.2.3.2 When employees are moving vertically and/or horizontally on the vertical face of rebar assemblies built in place, fall protection is not required.
  - 24.2.3.3 OSHA considers the multiple hand holds and foot holds on rebar assemblies as providing similar protection than that which is provided by a fixed ladder; consequently, no fall protection is necessary while moving point to point for heights below 24 feet.
  - 24.2.3.4 An employee must be provided with fall protection when climbing or otherwise moving at a height more than 24 feet, the same as for fixed ladders.
- 24.2.4** Holes

- 24.2.4.1 “Hole” means a gap or void two inches or more in its least dimension in a floor, roof, or other walking/working surface.
- 24.2.4.2 Personal fall arrest systems, covers, or guardrail systems SHALL be erected around holes (including skylights) that are more than six feet above lower levels.
- 24.2.4.3 Holes covered with plywood, planking, or other substantial materials should be anchored to the substrate and labeled/marked to warn of hazard below.
- 24.2.5 Hoist Areas**
- 24.2.5.1 Each employee in a hoist area SHALL be protected from falling six feet or more by guardrail systems or personal fall arrest systems.
- 24.2.5.2 If guardrail systems (or chain gate or guardrail) or portions thereof must be removed to facilitate hoisting operations, as during the landing of materials, and a worker must lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee must be protected by a personal fall arrest system.
- 24.2.6 Ramps, Runways, and Other Walkways**
- 24.2.7** Each employee using ramps, runways, and other walkways SHALL be protected from falling six feet or more by guardrail systems.
- 24.2.8 Roofing**
- 24.2.8.1 Low-slope roofs
  - a. Each employee engaged in roofing activities on low-slope roofs with unprotected sides and edges six feet or more above lower levels SHALL be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or a combination of a warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system. On roofs 50 feet or less in width, the use of a safety monitoring system without a warning line system is permitted.

**24.2.8.2** Steep roofs

b. Each employee on a steep roof with unprotected sides and edges six feet (1.8 meters) or more above lower levels SHALL be protected by guardrail systems with toeboards, safety net systems, or personal fall arrest systems.

**24.2.9** Wall Openings

24.2.9.1 Each employee working on, at, above, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is six feet (1.8 meters) or more above lower levels and the inside bottom edge of the wall opening is less than 39 inches above the walking/working surface must be protected from falling by the use of a guardrail system, a safety net system, or a personal fall arrest system.

**24.2.10** Leading Edges

24.2.10.1 Each employee who is constructing a leading edge six feet or more above lower levels SHALL be protected by guardrail systems, safety net systems, or personal fall arrest systems. If the employer can demonstrate that it is infeasible or creates a greater hazard to implement these systems, he or she must develop and implement a fall protection plan.

**24.2.11** Industry Best Practice(s) Adopted by the Company.

24.2.11.1 Electrical Transmission and Distribution (ET&D) OSHA Partnership - Wood pole and lattice tower structure best practices have been adopted by the company and require 100% fall protection above four feet, regardless of the activity.

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**24.3. Fall Protection Systems Criteria and Practices**

**24.3.1** Guardrail Systems - If the employer chooses to use guardrail systems to protect workers from falls, the systems must meet the following criteria:

24.3.1.1 Toprails and midrails of guardrail systems must be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations.

- 24.3.1.2 If wire rope is used for top rails, it must be flagged at not more than six-foot intervals with high-visibility material.
- 24.3.1.3 Steel and plastic banding cannot be used as top rails or mid rails.
- 24.3.1.4 Manila, plastic, or synthetic rope used for top rails or mid rails must be inspected as frequently as necessary to ensure strength and stability.
  - a. The top edge height of top rails, or (equivalent) guard rails, must be 42 inches plus or minus three inches above the walking/working level.
  - b. Screens, mid rails, mesh, intermediate vertical members, or equivalent intermediate structural members must be installed between the top edge of the guard rail system and the walking/working surface when there are no walls or parapet walls at least 21 inches high.
  - c. Other structural members, such as additional mid rails and architectural panels, SHALL be installed so that there are no openings in the guard rail system more than 19 inches wide.
  - d. The guard rail system must be capable of withstanding a force of at least 200 pounds in any outward or downward direction.
  - e. Mid rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members SHALL be capable of withstanding a force of at least 150 pounds.
  - f. Guard rail systems SHALL be surfaced to protect workers from punctures or lacerations and to prevent clothing from snagging.
  - g. The ends of top rails and mid rails must not overhang terminal posts, except where such overhang does not constitute a projection hazard.
  - h. When guard rail systems are used at hoisting areas, a chain, gate, or removable guard rail section must be placed across the access opening between guard rail sections when hoisting operations are not taking place.

- i. At holes, guardrail systems must be set up on all unprotected sides or edges. When holes are used for the passage of materials, the hole SHALL have not more than two sides with removable guardrail sections. When the hole is not in use, it must be covered or provided with guardrails along all unprotected sides or edges.
- j. If guardrail systems are used around holes that are used as access points (such as ladderways), gates must be used, or the point of access must be offset, to prevent people from inadvertently walking into the hole.
- k. If guardrails are used at unprotected sides or edges of ramps and runways, they must be erected on each unprotected side or edge.

**24.3.2** Personal Fall Arrest Systems - These consist of an anchorage, connectors, and a body harness and may include a deceleration device, lifeline, or suitable combinations. If a personal fall arrest system is used for fall protection, it must do the following:

- 24.3.2.1 Be rigged so that an employee cannot free fall more than six feet (1.8 meters), nor contact any lower level;
- 24.3.2.2 Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to three and a half (3.5) feet, and;
- 24.3.2.3 Have sufficient strength to withstand twice the potential impact energy of an employee free-falling a distance of six (6) feet or the free fall distance permitted by the system, whichever is less.

*Note: The use of a body belt for fall arrest is prohibited.*

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- a. Personal fall arrest systems must be inspected prior to each use for wear damage and other deterioration. Defective components must be removed from service. D-rings and snaphooks must have a minimum tensile strength of 5,000 pounds. D-rings and snaphooks SHALL be proof-tested by the manufacturer to a minimum tensile load of 3,600 pounds without cracking, breaking, or suffering permanent deformation.
- b. Snaphooks SHALL be sized to be compatible with the member to whom they will be connected, or SHALL be of a locking configuration.
- c. Unless the snaphook is a locking type and designed for the following connections, they SHALL NOT be engaged:
  - Directly to webbing, rope, or wire rope;
  - To each other;
  - To a D-ring to which another snaphook or other connector is attached;
  - To a horizontal lifeline, or;
  - To any object incompatible in shape or dimension relative to the snaphook, thereby causing the connected object to depress the snaphook keeper and release unintentionally.
- d. Hooks on lanyards should be a significant size to prevent "roll out."
- e. On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline SHALL be capable of locking in both directions on the lifeline.
- f. Horizontal lifelines SHALL be designed, installed, and used under the supervision of a qualified person, as part of a complete personal fall arrest system that maintains a safety factor of at least two. Lifelines SHALL be protected against being cut or abraded.

- g. Self-retracting lifelines and lanyards that automatically limit free-fall distance to two feet or less SHALL be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully-extended position.
- h. Self-retracting lifelines and lanyards that do not limit free-fall distance to two feet or less, ripstitch lanyards, and tearing and deforming lanyards SHALL be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully-extended position.
- i. Ropes and straps (webbing) used in lanyards, lifelines, and strength components of body belts and body harnesses SHALL be made of synthetic fibers.
- j. Anchorages SHALL be designed, installed, and used under the supervision of a qualified person, as part of a complete personal fall arrest system that maintains a safety factor of at least two, i.e., capable of supporting at least twice the weight expected to be imposed upon it.
- k. Anchorages used to attach personal fall arrest systems SHALL be independent of any anchorage being used to support or suspend platforms; and must be capable of supporting at least 5,000 pounds per person attached.
- l. Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds.

### **24.3.3** Work Positioning Systems

- 24.3.3.1 Work positioning systems are to be set-up (rigged) so that workers cannot free fall more than two feet.

*Note: Climbing wood poles with climbing hooks and a non-cinching climbing strap (lineman's belt) is prohibited.*

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- 24.3.3.2 They SHALL be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.

24.3.3.3 Requirements for snaphooks, D-rings, and other connectors used with positioning systems must meet the same criteria as those for personal fall arrest systems.

24.3.3.4 All snaphooks will be double-locking design. Those without double-locking design SHALL be removed from service.

#### **24.3.4 Safety Monitoring Systems**

24.3.4.1 When no other alternative fall protection has been implemented, the employer SHALL implement a safety monitoring system.

24.3.4.2 Employers must appoint a competent person to monitor the safety of workers and the employer SHALL ensure that the safety monitor:

- a. Is competent in the recognition of fall hazards;
- b. Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices;
- c. Is positioned on the same walking/working surfaces as the workers and can see them;
- d. Is close enough to work operations to communicate verbally with workers and has no other duties to distract from the monitoring function.
  - Mechanical equipment SHALL NOT be used or stored in areas where safety monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.
  - No worker, other than one engaged in roofing work (on low-sloped roofs) or one covered by a fall protection plan, SHALL be allowed in an area where an employee is being protected by a safety monitoring system.
  - All workers in a controlled access zone SHALL be instructed to promptly comply with fall hazard warnings issued by safety monitors.

#### **24.3.5 Warning Line Systems**

24.3.5.1 Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set-up as follows:



- a. Flagged at not more than 6-foot intervals with high-visibility material;
- b. Rigged and supported so that the lowest point (including sag) is no less than 34 inches from the walking/working surface; and its highest point is no more than 39 inches from the walking/working surface.
- c. Stanchions, after being rigged with warning lines, SHALL be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;
- d. The rope, wire, or chain SHALL have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, must support without breaking, the load applied to the stanchions as prescribed above.
- e. Shall be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over.
  - Warning lines SHALL be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line SHALL be erected not less than six feet from the roof edge parallel to the direction of mechanical equipment operation; and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation.
  - When mechanical equipment is not being used, the warning line must be erected not less than six feet from the roof edge.

- 24.3.6** A controlled access zone is a work area designated and clearly marked in which certain types of work (such as overhand bricklaying) may take place without the use of conventional fall protection systems – guardrail, personal arrest or safety net – to protect the employees working in the zone.
- 24.3.7** Controlled access zones are used to keep out workers other than those authorized to enter work areas from which guardrails have been removed.
- 24.3.8** Controlled access zones, when created to limit entrance to areas where leading edge work and other operations are taking place, must be defined by a control line or by any other means that restrict access.
- 24.3.9** Control lines SHALL consist of ropes, wires, tapes or equivalent materials, and supporting stanchions, and each must be:
- 24.3.9.1 Flagged or otherwise clearly marked at not more than six-foot intervals with high-visibility material;
- 24.3.9.2 Rigged and supported in such a way that the lowest point (including sag) is not less than 39 inches from the walking/working surface; and the highest point is not more than 45 inches;
- 24.3.9.3 Strong enough to sustain stress of not less than 200 pounds; control lines SHALL extend along the entire length of the unprotected or leading edge and SHALL be approximately parallel to the unprotected or leading edge, and;
- 24.3.9.4 Control lines also must be connected on each side to a guardrail system or wall.
- 24.3.10** When control lines are used, they SHALL be erected not less than 6 feet (1.8 meters), nor more than 25 feet, from the unprotected or leading edge, except when precast concrete members are being erected. In the latter case, the control line is to be erected not less than six feet, nor more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge.

- 24.3.11** Controlled access zones, when used to determine access to areas where overhand bricklaying and related work are taking place, are to be defined by a control line erected not less than 10 feet, nor more than 15 feet from the working edge. Additional control lines must be erected at each end to enclose the controlled access zone.

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**24.4. Covers**

- 24.4.1** Covers located in roadways and vehicular aisles must be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected. All other covers must be able to support at least twice the weight of employees, equipment, and materials that may be imposed on the cover at any one time. To prevent incidental displacement resulting from wind, equipment, or workers' activities, all covers must be secured. All covers SHALL be color coded or bear the markings "HOLE" or "COVER."

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**24.5. Protection from Falling Objects**

- 24.5.1** When guardrail systems are used to prevent materials from falling from one level to another, any openings must be small enough to prevent passage of potential falling objects. No materials or equipment except masonry and mortar SHALL be stored within four feet of working edges. Excess mortar, broken or scattered masonry units, and all other materials and debris SHALL be kept clear of the working area by removal at regular intervals.
- 24.5.2** During roofing work, materials and equipment SHALL NOT be stored within six feet of a roof edge unless guardrails are erected at the edge, and materials piled, grouped, or stacked near a roof edge must be stable and self-supporting.
- 24.5.3** Canopies
- 24.5.3.1** When used as protection from falling objects canopies must be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto them.

**24.5.4** Toeboards

24.5.4.1 When toeboards are used as protection from falling objects, they must be erected along the edges of the overhead walking/working surface for a distance sufficient to protect persons working below. Toeboards SHALL be at least 3-1/2 inches in height, and withstand at least 50 pounds of force in a downward and outward direction. Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening must be erected from the walking/working surface or toeboard to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employees below.

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**24.6. Three Points of Contact**

24.6.1 When ascending or descending vehicles, equipment, ladders, structures, etc., the practice of three points of contact SHALL be the required.

24.6.2 The practice of three points can be defined as two hands and one foot **OR** two feet and one hand remain in contact while ascending or descending.

*Note: Excluding emergency situations (vehicle/truck fire, equipment fire, etc.) **DO NOT JUMP** off equipment, vehicle/trucks, ladders, structures, trailers, floats, railcars, etc. If steps are provided for the purpose of ascending and descending, use them. If steps are not provided, use a ladder as the means of safe ascending and descending.*

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**25. LOCATING UNDERGROUND LINES - DAMAGE PREVENTION**

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**25.1. Introduction/General Requirements**

25.1.1 Federal, state, local, and EEC company policies all require the locating, and avoidance, of underground facilities during excavation operations.

**25.1.2**      Underground facilities are defined as: any public or private personal property which is buried, placed below the ground or submerged on a right-of-way, easement, public street, other public place or private property, and is being used or will be used for the conveyance of water, sewage, telecommunications, cable television, electricity, oil, petroleum products, gas, optical signals, traffic control, sprinkler systems, underground storage tanks, or for the transportation of hazardous liquids regulated pursuant to the "Hazardous Liquid Pipeline Safety Act of 1979."

**25.1.3**      Contact with underground facilities is an ever-present concern in most of the work we do. Of primary importance is the safety issue posed by contact with underground facilities. The secondary issue is economic. As the underground becomes more crowded and these facilities become more critical to business, the interruption of the services provided by these facilities becomes very costly. We are now seeing claims that include significant 'consequential damages' from one cable cut. We must identify, adopt, and use the best techniques and training available in an effort to reduce, with a goal of eliminating, any damage to underground facilities as a result of our work.

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**25.2.      Planning**

**25.2.1**      Assign one person on each job to be responsible for all underground locating activity on that job. This includes contacts with One Call centers, as well as any individual underground facilities operators. This reduces the chance of something being overlooked because "someone else was going to do that."

**25.2.2**      Review all job documents (plans, specifications, sketches, etc.) and note all underground facilities shown or mentioned. Find out what the local requirements are for markouts. Verify the local color code for individual types of facilities.

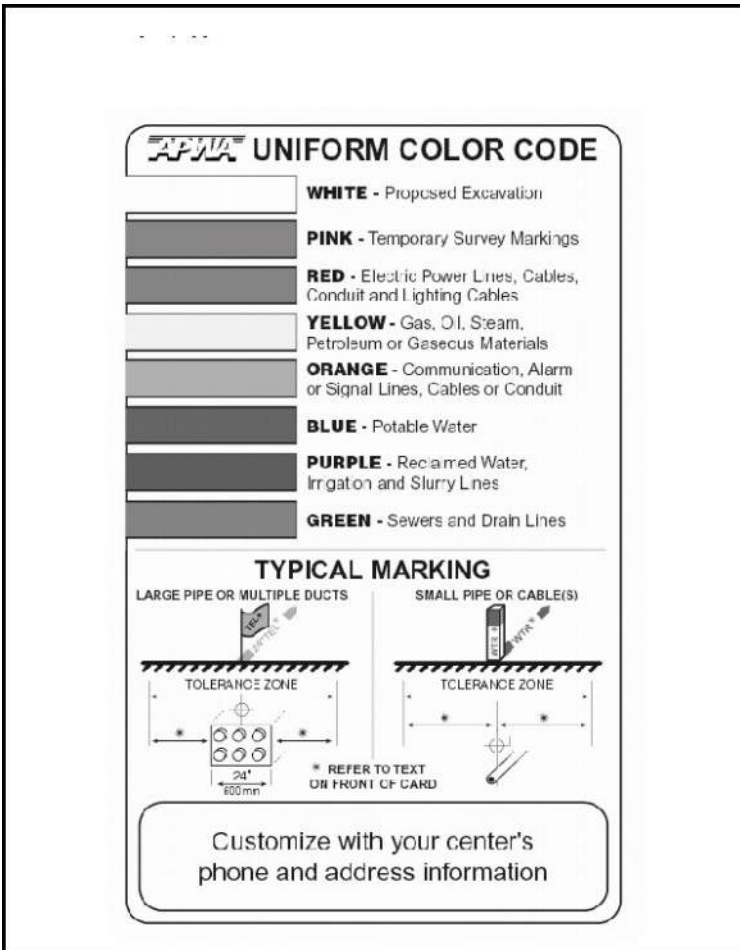
- 25.2.3** Call the One Call service regarding the specified area of the work at least the minimum required time for that area (48, 72 or whatever hours required, note that weekend and holiday hours usually do not count). Make sure the One Call provider covers all the territory included by the job. Call additional One Call services as required.
- 25.2.4** Call directly to any facilities owners not covered by the One Call services.
- 25.2.5** Document ALL contact with the One Call providers and owners using the Markout Report. Do not use any other contractor's or customer's verification/work number for EEC's work. Each excavating contractor must have their own separate One Call reference number.
- 25.2.6** Contact all private property owners affected by the job. Request them to markout their underground facilities and have them sign the Private Property Markouts form.
- 25.2.7** Prepare a list of all known owners of underground facilities, and the name and phone number of an emergency contact at each. Include the numbers of local fire, rescue, and medical facilities, where possible.
- 25.2.8** Supervisor SHALL have One Call ticket on-site or immediately available for identifying the verification number, start date, scope of ticket, and expiration date.
- 25.2.9** Whenever feasible, meet with the locating person at the job site and review the job.
- 25.2.10** Perform a sweep of the job site to;

  - 25.2.10.1 Verify the locates of the locating person
  - 25.2.10.2 Check for unknown facilities not on the drawing or on the locating service records. This is especially important when on private property. Use experience and common sense to spot signs of underground facilities such as markers, trench lines, poles, and pits that probably are connected, etc. Look for risers, meters, pedestals, pad-mounted transformers, and other like facilities and verify that the respective service is marked. Make sketches and take photographs of markouts for reference if needed later.

- 25.2.11 If you think that a facility has not been properly located or not located at all, call the One Call center or owner again and ask for another locate.

Figure 22: APWA Uniform Color Code Chart

(See inside front cover pages for color version of this chart.)



### **25.3. During Construction**

- 25.3.1** Follow all standard safety measures including traffic control and wearing of PPE when performing any activity associated with locating, and avoiding, underground facilities. Know the color code for all facilities located.
- 25.3.2** Review the location of all underground facilities on the job with all site personnel and go over the activity hazard analysis "Preparation for Excavation."
- 25.3.3** Verify the expiration date of the markout ticket. If the job is expected to continue past this date, notify the One Call service or the owner the required number of hours ahead of time so that work will not be stopped while the ticket is renewed.
- 25.3.4** Pothole and expose the underground facility at all crossings or close parallels with the work in progress. Use 'soft' digging methods, such as a vacuum truck or air knife, where possible. In all cases use nonconductive (i.e., fiberglass or wood) hand tools. If standard tools are necessary, dielectric gloves SHALL be worn. Make sure the gloves have a valid test date on them.
- 25.3.5** During excavation and/or directional drilling, place a person at each underground facility crossing or close parallel to act as a spotter to assist the equipment operator in avoiding any contact with the facility.
- 25.3.6** DO NOT GUESS OR ASSUME WHERE A FACILITY IS OR ISN'T! If there is any question about the accuracy of a locate, do not guess. Verify with our own locator or call the owner out to verify again, if necessary.
- 25.3.7** Take care to preserve and protect all markouts at the job site. If markouts are obscured before work is completed, call for a remark.
- 25.3.8** When uncovering (potholing) an underground facility prior to performing your own work, clear a 'buffer' zone on all sides (360 degrees) of the marked underground facility as required by local or state law. Excavating underneath the marked facility especially protects facilities placed vertically.



**25.3.9** Record any instance when a facility is not found where marked, as well as any facility that is found but was not marked by the locating service. Keep a copy of this record and include a copy in the as-built documents.

**25.3.10 Emergency notification:**

In the event you cause or discover a leak or damage to a line or pipe carrying flammable gas (example: natural gas), liquid petroleum, or other hazardous liquid or gas, immediately do the following:

- Turn off all equipment if it can be done safely. Abandon all equipment and get a safe distance away.
- Call 911 and report the incident and thereafter report the damage to the operator/owner/utility and your supervisor. If you cannot reach the operator/owner/utility, report the damage to the One-Call Center at 811 or the 1-800 number for the One-Call Center in the state in which you are working.
- Evacuate the area and keep people out.
- Avoid open flames or anything that might start a fire in the immediate area of the leak or damage. Do not start motor vehicles or electrical equipment. Remove all ignition sources (cigarettes, cell phones, or anything that could create a spark or static electricity).
- Remain on-site to convey any pertinent information to the emergency responders.

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**25.4. Key Issues/Problems**

**25.4.1** Unmarked facilities: facilities that are not on the design drawings or the One Call records.

**25.4.2** Mismarked facilities: facilities marked but outside the 'buffer zone'.

**25.4.3** Unmarked private facilities: facilities on private property and not part of the One Call database.

**25.4.4** Non-metallic facilities without trace wire: impossible to locate with conventional locating instruments although new vibration methods and ground penetrating radar now exist.

**25.4.5** Shallow facilities: facilities installed above the 'standard' depth.

**25.4.6** Multiple facilities in a common trench: finding the first facility in a pothole doesn't mean you have found them all.

- 25.4.7 Loops in facilities: often a problem with facilities placed parallel to the path of the new installation. A safe separation may not hold for the entire run as the existing facility may have an off set, loop, or butt splice in the path of the new facility.
- 25.4.8 Carelessness: not taking sufficient care to locate and then pothole all facilities.
- 25.4.9 Rushing to complete the job: one hit can stop a job far longer than taking the time to do it right the first time.
- 25.4.10 Lost or obscured markings: don't guess as to where you think you remember a markout being. Call for a remark or do your own locating.
- 25.4.11 Safety: observe all safety rules while locating and potholing underground facilities.
- 25.4.12 Job delays: waiting for a locate and/or potholing when a facility isn't where the markout shows it to be (expensive).
- 25.4.13 Job delays: if a facility is hit and requires repair (VERY expensive).

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**25.5. Locating**

- 25.5.1 All initial locating on a job should be performed by the owner(s) of the existing underground facilities or the legally designated One Call locating service for that area.
- 25.5.2 Only a trained EEC locator should be assigned the task of performing any of our own locating on a job.
- 25.5.3 All locating equipment is not the same. Some equipment is designed for specific locating conditions while other equipment is multipurpose. Make sure the locating equipment used on a job is designed to do the type of locating being performed.
- 25.5.4 Locator training SHALL consist of at least:
  - 25.5.4.1 Map and drawing reading symbols, color codes, industry standards
  - 25.5.4.2 Theory of locating instrumentation
  - 25.5.4.3 Hands-on use of various types of locating instruments
  - 25.5.4.4 At least 40 hours of on-job-training with an experienced locator, including actual potholing of 'located' facilities
  - 25.5.4.5 Safety issues associated with locating

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## **26. EMERGENCY PLANNING AND FIRST AID**

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### **26.1. Emergency Planning**

- 26.1.1** The information given is general. Specific action to be taken at the scene of an emergency cannot be predetermined and will necessarily be modified by the situation. It is important that employees be familiar with the contents of this section and local emergency procedures in the event of an incident.
- 26.1.2** Person in charge SHALL be trained in first aid and cardio pulmonary resuscitation (CPR).
- 26.1.3** Panel of approved medical facilities SHALL be displayed at show-up sites.
- 26.1.4** Nearest medical facilities SHALL be documented on the job briefing sheet.
- 26.1.5** All employees should be made aware of the medical services available and how to obtain them.

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### **26.2. First Aid**

#### **26.2.1** Introduction

- 26.2.1.1** The material in this section is intended to act as an overall guide to first aid activities. It is not designed as a self-teaching course, but merely reviews some aspects of first aid techniques for those who have received training in first aid.
- 26.2.1.2** Details for first aid treatment may be found in the American Red Cross Standard First Aid Book and the U.S. Bureau of Mines First Aid Manual.
- 26.2.1.3** CPR treatment should be performed only by persons who are properly trained and qualified, or otherwise following the direction of a qualified emergency responder.

#### **26.2.2** General

26.2.2.1 Employees SHALL be familiar with the basic techniques for first aid so that they may provide emergency treatment to fellow employees. Personnel should be knowledgeable of the treatment for traumatic shock, means of giving artificial respiration, and control of bleeding.

26.2.2.2 Personnel engaged in overhead line work SHALL know the essential elements of pole-top rescue. They should also be familiar with resuscitation techniques, and how to apply these techniques in an elevated position.

26.2.2.3 First aid kits are to be supplied; employees SHALL be familiar with the location, the contents, and the instructions given with the first aid kit. Each employee SHALL learn to use this equipment so he can render treatment when needed. Except for minor injuries the service of a physician SHALL be obtained.

26.2.2.4 The contents of the first aid kits SHALL be inspected each week and expended items replaced.

### **26.2.3 Wounds and Control of Bleeding**

26.2.3.1 A person can bleed to death in a very short time — less than one minute. Therefore, in the event of an injury that results in significant bleeding, immediate steps must be taken to prevent the loss of blood.

26.2.3.2 Bleeding may be controlled by the following methods:

- a. Direct pressure. Application of pressure directly on the wound. Use of a sterile dressing is preferred. In an emergency, use any dressing.
- b. Indirect pressure or pressure points. Application of pressure on the arterial pressure points in the arm or leg. Pressure points may be combined with direct pressure to restrict severe bleeding.
- c. Elevation. Loss of blood can be slowed by raising the wound above the level of the heart.
- d. Possibility of shock is present in all cases of serious bleeding. Prompt attention must be given for prevention and/or treatment of shock.

### **26.2.4 Shock**

26.2.4.1 Shock is a life-threatening condition when an insufficient blood supply is being sent to all parts of the body.

- 26.2.4.2 Shock is likely to develop when any serious injury or illness occurs. This could be a result of severe bleeding, serious injury, severe allergic reaction, or significant fluid loss.
- 26.2.4.3 Symptoms or signals of shock are:
- a. Restlessness or anxiety
  - b. An altered level of consciousness
  - c. Rapid breathing
  - d. Rapid pulse
  - e. Pale or ashen, cool, moist skin
  - f. Nausea and vomiting
  - g. A blue tinge to lips and nail/beds
- 26.2.4.4 Recommended treatment for shock is:
- a. After checking the scene to be sure it is safe, check the victim, and then call 911.
  - b. Monitor the victim's airway, breathing, and circulation.
  - c. Control any external bleeding.
  - d. Keep the person from getting chilled or overheated.
  - e. Help person to rest comfortably. If the victim is not having trouble breathing, or if you do not suspect a head, neck, or back injury, or broken bones in the hips or legs, elevate the legs about 12 inches
  - f. Comfort and reassure the victim until EMS personnel arrive and take control.
  - g. Do not give food or drink.
  - h. Moving an injured person can cause additional injury and pain. Move an injured victim only if:
    - The scene becomes unsafe.
    - You must reach another victim with a serious injury.
    - You need to move the injured person in order to provide proper care (e.g., a flat surface to administer CPR).
    - Perform necessary CPR and First Aid until EMS arrives and is able to transport.

- i. Proper transportation practice is never more imperative than in the case of a person who may develop shock. It constitutes the most important single measure in the prevention and treatment of shock. Use an ambulance, if possible. If other means must be used, follow the above instructions as closely as possible.

## **26.2.5 Eye Injuries**

### **26.2.5.1 Foreign bodies**

- a. When a small foreign body, such as dust or a wood flake is on the eye or eye lid, moderate efforts may be made to remove it. The edge of a clean handkerchief or similar device may be used. Never use a match stick, knife, or other such instrument that might cause damage to the eye.
- b. Objects imbedded in the eye must be removed by a physician. Both eyes of the injured should be bandaged loosely and the employee taken to the hospital immediately. The injured employee should be told to relax and try not to move their eyes.
  - Chemical burns — acid or caustic. Immediate irrigation of the eye with large quantities of clean water is mandatory whenever a chemical substance enters the eye. Flushing of the eye with running water should continue for 15 minutes.
  - All eye injury cases, regardless of first aid measures taken, should be taken to a physician to be checked and treated.

## **26.2.6 Burns and Scalds**

26.2.6.1 Burns are usually the result of contact with dry heat, electricity, or chemicals; whereas scalds are usually the result of contact with hot solutions, hot vapors, or steams. Electricity may cause burns either by current passing through the body or by an electric arc or flash.

### **26.2.6.2 Classification of burns and scalds:**

- a. First degree: reddening of the skin.
- b. Second degree: the formation of blisters.

- c. Third and fourth degree: deeper destruction of tissue and possible involvement of bone.

**26.2.6.3**

Treatment - The first aider's duties in the treatment of burns and scalds are to prevent infection and treat for shock, which should be done without delay.

- a. Minor burns: a burn in which the degree and size of the burned area is such that it does not require the immediate services of a doctor.
  - Apply approved burn ointment to a sterile dressing and place directly over burn.
  - Bandage in place, firmly but not too tightly.
- b. Major burns: a burn in which the degree and size of the burned area is such that it requires the immediate service of a physician.
  - Cool the burned area with water.
  - Cover with a dry, sterile dressing to prevent infection.
  - Care for shock while waiting for EMS personnel.
  - Do not put any kind of ointment on a burn.
  - Do not attempt to remove any clothing that is sticking to the victim.
- c. Chemical burns
  - Flush burned area with large amounts of cool, running water.
  - Help injured person remove contaminated clothing if it can be done without coming into contact with chemicals.
  - Cover with a dry, sterile dressing to prevent infection.
  - Care for shock while waiting for EMS personnel.

**26.2.7** Bites and Stings

**26.2.7.1**

Animal bites (including conditions in which human teeth may break the skin). In addition to the effects common to other wounds, some animal bites may cause rabies.

- a. Treatment:
  - Wash the wound and surrounding tissue with soapy water to remove saliva.

- Apply an antiseptic to the wound and surrounding area.
- Apply a sterile dressing directly over the wound and bandage in place.
- Obtain medical attention.

**26.2.8 Snake Bites - Poisonous**

**26.2.8.1 Symptoms:**

- a. Rapid swelling
- b. Rapid pulse, nausea and vomiting
- c. Shortness of breath
- d. Very painful

**26.2.8.2 Treatment:**

- a. Keep the victim as calm as possible, while keeping the injured part lower than heart level.
- b. Get medical attention immediately.
- c. If professional medical care is delayed, immobilize the limb with a splint.

**26.2.8.3 Other considerations:**

- a. If the bite is on the hand or arm, remove all jewelry from the affected area.
- b. Identifying the snake. If the snake can be killed without risk or delay, it should be brought, with care, to the hospital for identification.
- c. Do not apply ice or cold compresses.
- d. Do not give alcohol, sedatives, aspirin, or other medications.

**26.2.9 Insects -** There are a variety of insects that have biting or stinging mouth parts which may inject toxic materials into the skin. These conditions are usually of minor medical importance, causing temporary pain, irritation, and general discomfort. Infection may develop if the wound is not properly cared for.

**26.2.9.1 Treatment:**

- a. If stinger remains in wound, remove it.
- b. Swab affected parts of the skin with medicated insect swab and gently rub into the skin, or apply antiseptic to the wound.
- c. Do not scratch the wound.
- d. Cover the wound with bandage.



- e. Employees known to be particularly allergic to any insect venom should be seen by a physician without delay.

**26.2.10** Transportation - Serious Injury

26.2.10.1 The improper handling of an injured person may cause additional injury or the complication of an existing injury. A person with serious injuries should be moved only if in danger of being further injured. The necessary first aid treatment should be rendered to the injured person at the scene of the incident until help is summoned. If help is delayed, transport by best method available.

26.2.10.2 Seriously injured persons should be moved on a stretcher or in lying-down position.

*Note: All persons with fractures or suspected fractures should be handled very carefully. Fractures to the skull, neck, chest, spine, or other extremities require special care. Request the services of a physician or emergency medical technician at the scene of the incident if available.*

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**26.2.11** Poison Ivy

26.2.11.1 Prevention:

- a. If working in areas where poison ivy may be found, shirts with full-length sleeves should be worn with the sleeves rolled down and buttoned. Trouser cuffs should be fastened around the ankles. All exposed areas of the skin should have a film of approved protective ointment applied as a preventive measure.
- b. Avoid breathing or contacting smoke of burning brush that may contain poison ivy.
- c. Immediately after exposure remove contaminated clothing and wash the affected areas thoroughly with soap and water, and apply approved medicated ointment. Care should be used in cleaning contaminated clothing to avoid reinfection.
- d. Symptoms are most common within 12 to 24 hours after contact, although they may appear within a few hours or be delayed several days.

- Red rash, inflammation, and swelling
- Appearance of blisters
- Breaking of the blisters and excretion of fluid

- 26.2.11.2 Treatment:
- a. Wash affected skin area with soap and water.
  - b. Apply approved medicated ointment to area to reduce discomfort.
  - c. Avoid scratching affected area.
  - d. In severe cases, obtain medical attention.

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## **26.3. Bloodborne Pathogens**

**26.3.1** Engineering and work practice controls SHALL be used to eliminate or minimize exposure to employees. Where occupational exposure remains after institution of these controls, employees are required to wear PPE. The following practices SHALL be used:

- 26.3.1.1 Universal precautions SHALL be observed to prevent contact with blood, body fluids, or other potentially infectious materials.
- 26.3.1.2 All blood or potentially contaminated material SHALL be considered infectious regardless of the perceived status of the source individual.
- 26.3.1.3 An exposure incident SHALL be reported to the regional safety manager, safety personnel, or immediate supervisor no later than the end of the work day, including weekends.
- 26.3.1.4 PPE (i.e., latex gloves, resuscitation bags or masks, etc.) SHALL be provided with each first aid kit.
- 26.3.1.5 Latex gloves SHALL be worn when any potential exposure incident occurs.
- 26.3.1.6 Pocket breathing masks SHALL be used should an employee be required to perform CPR.
- 26.3.1.7 All garments penetrated by blood are to be removed immediately, or as soon as feasible.
- 26.3.1.8 Eye protection SHALL be worn by employees when providing first aid to a bleeding victim.

- 26.3.1.9 Employees SHALL wash their hands and any other exposed area of skin with soap and water following emergency medical treatment.
- 26.3.1.10 Clean and disinfect all equipment and work surfaces potentially contaminated with blood or other potentially contaminated material.
- 26.3.1.11 Employees SHALL NOT eat, drink, smoke, apply cosmetics, handle contact lenses, etc., in areas where exposure to infectious materials may occur.
- 26.3.1.12 Use disposable gloves and other PPE when cleaning up spills. Wipe up spill with paper towels or other absorbent material.

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## **27. OFFICE SAFETY**

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### **27.1. Prevention**

- 27.1.1** A large percentage of workplace incidents and injuries occur in office buildings. Like the shop or garage, the office requires a few preventive measures to ensure a safe and healthful environment. Common causes of office incidents include the following:
  - 27.1.1.1 Slipping, tripping, and falling hazards.
  - 27.1.1.2 Burning, cutting, and pinching hazards
  - 27.1.1.3 Improper lifting and handling techniques
  - 27.1.1.4 Unobservant and inattentive employees
  - 27.1.1.5 Improper office layout and arrangement
  - 27.1.1.6 Dangerous electrical wiring
  - 27.1.1.7 Exposure to toxic substances
  - 27.1.1.8 Horseplay
  - 27.1.1.9 Using chairs or other office furniture to serve as a ladder

**27.1.2** The following sections address several office safety practices. Other preventive measures may be necessary in addition to the following guidelines.

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**27.2. Responsibilities**

**27.2.1 Office Manager**

27.2.1.1 The ultimate responsibility for office safety rests with the office manager. They are responsible to ensure all employees are properly trained and instructed in safe office practices and aware of all hazards associated with their work. All work hazards must be anticipated and appropriate safeguards utilized.

**27.2.2 Employee**

27.2.2.1 Shall bring to the attention of the office manager and/or safety personnel potential hazardous situations. Follow EEC health and safety policies, procedures, rules, and the instructions of the office manager or safety personnel.

**27.2.3 Safety Personnel/Department**

27.2.3.1 Shall assist office manager in correcting hazardous situations and designating safe working practices. Periodically inspects all office facilities to ensure compliance.

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**27.3. Safe Work Practices**

**27.3.1** Guard the sharp edges of furniture to prevent personal injury. Keep desk “pull-out” writing surfaces closed when not in use.

**27.3.2** Practice good housekeeping. Keep floors free of items that might cause tripping. Keep waste cans out of the way, do not overfill them.

**27.3.3** Prevent slipping incident by cleaning up spills immediately.

**27.3.4** Report all defects such as loose tiles, broken steps, railings, and doors immediately.

- 27.3.5** Keep razor blades, tacks, and other sharp objects in closed containers.
- 27.3.6** Use the proper tool for the job at hand (e.g., a staple remover to remove staples).
- 27.3.7** Do not overload electrical outlets. Do not plug a multiple-outlet strip, or an extension cord with multiple electrical receptacles, into a second multiple-outlet strip.
- 27.3.8** Report immediately, any damaged electrical cords, broken switches, loose connections, or bare wires.
- 27.3.9** Unplug any office machine that smokes, sparks, or delivers an electrical shock. Have it inspected by the appropriate repair personnel.
- 27.3.10** Avoid overloading the top drawers of filing cabinets to avoid the possible tipping of the cabinet when the drawers are opened. Open one drawer of the file cabinet at a time to prevent tipping. File cabinets should be placed where their use will not interfere with office traffic patterns.
- 27.3.11** Keep file and desk drawers closed when not in use to help prevent tripping incidents.
- 27.3.12** Be sure to use proper lifting techniques. Make arrangements with personnel skilled in moving to shift furniture and other heavy objects.
- 27.3.13** Do not lean too far back in chairs. This may result in over-balancing and a fall.
- 27.3.14** Use only safety step stools or ladders for climbing. Don't stand on swivel chairs or use them as step stools.
- 27.3.15** Bookcases or filing cabinets taller than 64 inches must be secured or anchored. Keep bookcase doors closed when not in use.
- 27.3.16** Power switches must be off, or the cord unplugged, when electrical equipment such as a typewriter is being cleaned or serviced.
- 27.3.17** Office doors SHALL be free of obstructions at all times to allow exit in case of an emergency.
- 27.3.18** Jewelry, long hair, and clothing must be kept clear of the moving parts of all office machines.

- 27.3.19** If it is necessary to run a cable or electrical cord across the floor, a cable cover must be used to protect the wiring and prevent tripping.
- 27.3.20** Do not cover air vents or obstruct air flow from registers. Do not place furniture, equipment, or materials in locations that will interfere with air movement around thermostats.
- 27.3.21** Ensure that office lighting is adequate and available. Replace burned-out light bulbs, and have additional lighting installed, as necessary.
- 27.3.22** Maintain clear and unobstructed access to emergency equipment, such as fire extinguishers, pull stations, eyewash units, showers, etc.
- 27.3.23** Machine rooms housing utility equipment are not storage areas. Fire and life safety codes state that these rooms must be clear of any obstructions that would slow or prevent access by emergency personnel.
- 27.3.24** Fire and life safety codes prohibit stacking boxes closer than 18 inches to the ceiling. Store clearly-marked boxes in an approved storage space.
- 27.3.25** Fire and life safety codes prohibit the use of hallways for storage; boxes, filing cabinets, tables and chairs, etc., are not to be stored in the hallways.

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**27.4. Workstations**

- 27.4.1** Ensure correct working height of chair, desk, and keyboard.
- 27.4.2** Sit in an upright position using good posture.
- 27.4.3** Adjust monitor and copy stand side by side and at a comfortable viewing angle.
- 27.4.4** Set angle of monitor and copy stand to reduce glare.
- 27.4.5** Keep wrists and hands in line while using keyboard and mouse. Avoid bending wrists forward or backward.
- 27.4.6** When using a video display terminal, blink frequently to maintain eye surface moisture.

- 27.4.7** To prevent eye fatigue, momentarily focus eyes on a distant object.
- 27.4.8** When using a video display terminal (VDT) for prolonged periods, frequently stretch and move head, neck, shoulders, and arms to prevent buildup of muscletension.
- 27.4.9** Ensure chairs are easily and fully adjusted, and allow the body to shift position to the greatest extent possible. Use footrests when adjustments to the chair height do not relieve pressure under the thigh.
- 27.4.10** When continuously and simultaneously using the telephone and VDT, use telephone headrest, headset, or speaker phone to prevent injury.
- 27.4.11** Organize work areas to avoid stretching/twisting to reach items.

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**28. SHOP/YARD**

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**28.1. Safe Work Practices**

- 28.1.1** Before an operator uses shop tools and equipment, ensure he or she is qualified and/or has demonstrated skills.
- 28.1.2** Inspect machines before use, and clean after use.
- 28.1.3** Immediately remove defective machines from service, identify them, and do not use them until repaired.
- 28.1.4** When operating shop machinery tools, do not wear loose clothing and jewelry.
- 28.1.5** Do not operate equipment beyond manufacturer's and/or engineering's specifications.
- 28.1.6** Ensure manufacturer's instructions are available to the user.
- 28.1.7** Before operating equipment, ensure machine guards are in place to protect operator and personnel.
- 28.1.8** To protect persons from flying chips, use chip guards.

- 28.1.9 Lock and tagout machines if manufacturer's operational safeguards are rendered ineffective exposing employee to hazardous portions of machines or equipment.
- 28.1.10 Minor tool changes and adjustments which are required for normal production operations and which are routine, repetitive, and integral to equipment use do not normally require lockout/tagout procedures if alternative measures for effective employee protection are provided.
- 28.1.11 When removing chips and shavings from operating machinery, do not use hands.
- 28.1.12 When handling coolants, lubricants, solvents, or cutting fluids, refer to the product's MSDS for required PPE.
- 28.1.13 When cutting, drilling, or performing other machining operations, properly secure the work; and use the correct tool to perform the work.
- 28.1.14 Do not use hands rather than the appropriate securing device to hold the work in place.
- 28.1.15 Do not place hands in the operating area of the machine until the machine comes to a complete stop.
- 28.1.16 Maintain control of the machine operating area.
- 28.1.17 When operating equipment or handling materials in yard, employ all personal protective equipment, i.e., hard hat, safety glasses, gloves, high-visibility shirt or vest, and wear sturdy leather work boots.
- 28.1.18 When there is a potential for objects to be ejected from a machine such that injury may occur, wear a face shield, or safeguard the machine.
- 28.1.19 When overhead work is in progress, or when the potential for any head hazard exists, wear hard hats.

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**28.2. Flammable/Combustible Storage**

- 28.2.1 Containers in storage SHALL be located so as to minimize exposure to excessive temperature rise, physical damage, or tampering by unauthorized persons.
- 28.2.2 Approved fire extinguishers SHALL be mounted near tanks.



**28.2.3** Storage Cabinets

**28.2.4** Storage cabinets containing flammable materials must be distinctly labeled **“Flammable - Keep Fire Away”** and must meet National Fire Protection Association test requirements.

**28.2.5** Cabinets SHALL be kept closed when not in use.

**28.2.6** Inside Storage

28.2.6.1 Post flammable storage areas prominently as “No Smoking” areas. Openings to other rooms or buildings must be provided with non-combustible, liquid tight, raised sills, or ramps at least four inches in height.

28.2.6.2 Ventilation which provides for a complete change of air within a room at least six times each hour is required for inside storage rooms.

**28.2.7** Outside Storage

28.2.7.1 Driveways between and around open area storage for combustible materials must be at least 15 feet wide.

28.2.7.2 No combustible materials can be stored outdoors within 10 feet of a building or structure.

28.2.7.3 Outdoor storage of containers (less than 60 gallons) should not exceed 1,100 gallons in any one area.

28.2.7.4 Stacks of combustible/flammable materials must be separated by at least five feet; and not be nearer than 20 feet to a building.

28.2.7.5 Smoking is prohibited in outside storage areas for combustible/flammable and other hazardous materials.

28.2.7.6 NO SMOKING signs must be displayed prominently on storage tanks.

28.2.7.7 Provide proper guarding to protect tanks from vehicular damage.

28.2.7.8 Electrical connections including pumps and switches should be vapor and explosion proof.

**28.3. Temporary Facilities**

- 28.3.1** Trailers and other temporary structures used as field offices, to house personnel, or for storage SHALL be anchored with rods and cables or by steel straps to ground anchors. The anchor system SHALL be designed to withstand winds; and must meet applicable state or local standards for anchoring mobile trailer homes.
- 28.3.2** Temporary project fencing SHALL be provided on all projects located in areas of active use by members of the public. Consideration will also be given to those areas proximate to family housing areas and/or school facilities.
- 28.3.3** Signs warning of the presence of construction hazards and requiring unauthorized persons to keep out of the construction area SHALL be posted on the fencing.
- 28.3.4** When sanitary sewers are not available, one of the following facilities, unless prohibited by local codes, SHALL be provided: chemical toilets, recirculating toilets, combustion toilets, or other toilet systems as approved by state and local governments.
- 28.3.5** Solid and liquid waste SHALL be removed in a way that avoids creating a menace to health and as often as necessary to maintain a sanitary environment.
- 28.3.6** When any hazardous substance is procured, used, stored, or disposed, MSDSs for the substances SHALL be available at the worksite.
- 28.3.7** Portable Toilet Facilities

*Figure 23: Number of Portable Toilet Facilities*

Number of employees	Minimum facilities (per sex)
20 or less	One
21 to 199	One toilet seat and one urinal for every 40 workers
200 or more	One toilet seat and one urinal for every 50 workers

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## **29. ENVIRONMENTAL CONSIDERATIONS AND GUIDELINES**

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### **29.1. Employee Requirements**

**29.1.1** The following act as a minimum guideline; employees SHALL be familiar with EEC Corporate Environmental Program and EEC Spill Prevention and Response Program.

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### **29.2. New Yard or Office Location Considerations**

**29.2.1** Before setting up a new yard or office location; owned, rented, or leased; a Phase 1 Environmental Audit should be completed.

**29.2.2** As a minimum the following factors should be consider before establishing occupancy:

29.2.2.1 Purpose and function of land use;

29.2.2.2 Location of streams and/or wetlands;

29.2.2.3 Surface area (paved/dirt/other);

29.2.2.4 Surface water runoff;

29.2.2.5 Local laws and regulations concerning commercial property;

29.2.2.6 Previous use of land, and;

29.2.2.7 Duration of occupancy.

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### **29.3. Spill Response**

**29.3.1** In case of a spill of any type of oil or chemicals, your first course of action is to assure the safety of yourself, other employees, and the general public.

**29.3.2** Next step is to make sure you understand the hazards of the product; and that the required PPE is utilized.

**29.3.3** If the product is of no danger to your health, try to control the spill from its source.

- 29.3.4 Protect all environmental receptors, storm drains, surface water bodies, and soil.
- 29.3.5 Immediately after spill source has been controlled and measures have been taken to protect environmental receptors, notify your manager/supervisor and safety representative.
- 29.3.6 Each crew foreman SHALL have a spill kit available to contain a spill in the field.
- 29.3.7 Each reporting yard should have a spill response plan and agreement with a local authorized vendor for disposal.

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## **30. SUBCONTRACTOR AND SUPPLIER SAFETY**

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### **30.1. Requirements**

- 30.1.1 Subcontractors will be given a copy of all safety documents that are applicable to the project, which should include the provisions of the EEC Project Injury and Illness Prevention Program (IIPP), client stipulations, and contractual obligations at a pre-job safety meeting. It is the obligation of all contractors and/or subcontractors to comply with applicable statutory safety and health laws, regulations and rules covered. Subcontractors have the obligation to provide a safe and healthful working environment for employees and other persons at the project site, including the traveling public, who may be exposed to the work.
- 30.1.2 Directives and general guidelines for subcontractor safety and health programs SHALL be provided to each company prior to job start-up.
- 30.1.3 Minimum requirements for subcontractors will be to:
  - 30.1.3.1 Designate in writing a representative responsible for safety acceptable to the EEC project manager and project safety manager. The designated safety representative will be employed at the work site. Their duties SHALL include administration and implementation of the safety program.

- 30.1.3.2 Provide a written site specific IIPP which includes procedures covering the work to be submitted to the subcontractor monitor and the project safety manager prior to the start of work. The IIPP SHALL meet, at a minimum, the requirements of all applicable federal, state, and local government requirements and the EEC IIPP.
- 30.1.3.3 Comply with the requirements for new hire safety on boarding.
- 30.1.3.4 Report immediately to EEC all occupational injuries or illnesses requiring a doctor visit. The subcontractor will investigate such incidents, identifying true and actual root causes, and the corrective actions implemented to prevent recurrence. These reports, complete with supporting documentation, will be delivered to the project safety manager within 24 hours or as otherwise specified by the EEC project manager.
- 30.1.3.5 Promptly report all injuries and incidents to EEC. A copy of the incident investigation, initial medical reports, and the first report of injury SHALL be provided to the EEC project safety manager. A monthly summary of occupational injuries and illnesses, including man-hours worked, SHALL also be provided to EEC.
- 30.1.3.6 Provide or attend a safety and health on boarding for all new hires, which SHALL include, but not be limited to:
  - a. Daily log
  - b. Personal protective equipment required
  - c. Fire prevention
  - d. Emergency procedures
  - e. Hazard communications
  - f. Substance abuse prevention
  - g. Security requirements
  - h. Housekeeping procedures
  - i. Equipment safety
  - j. Other specific project requirements pursuant the SSSP
- 30.1.3.7 Conduct and document weekly safety and health training meetings for all employees.

- 30.1.3.8 Inform their supervisory personnel of the project safety and health program and of the contractor's / subcontractor's responsibility of providing a safe and healthful place to work for their employees.
- 30.1.3.9 Immediately report any OSHA/EPA inspections, and provide a copy of any inspection reports and citations to the project safety manager.
- 30.1.3.10 Maintain all equipment and tools in a safe condition.
- 30.1.3.11 Conduct and participate in safety and health inspections.
- 30.1.3.12 Provide a copy of all MSDSs for hazardous substances being used on the project to the project safety manager. Train employees in accordance with the Hazard Communication Standard to include location of project MSDSs, proper use, storage, spill and disposal procedures for hazardous materials used on the project.
- 30.1.3.13 Prepare and submit to the subcontractor monitor a site specific job hazard analysis (JHA) for each work phase and/or operation. Hourly employees and management familiar with the operation should jointly develop the hazard analysis.
- 30.1.3.14 Employ a competent person as designated by OSHA for all activities that require such a competent person.
- 30.1.3.15 Maintain compliance with CFR Title 49 Federal Motor Carrier Safety Regulations and Federal Hazardous Materials Regulations.

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## **31. REGULATORY COMPLIANCE INSPECTIONS (RCI)**

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### **31.1. Employee Responsibilities**

- 31.1.1 All employees are responsible for adhering with the policies and procedures contained within this section and for immediately contacting their supervisor upon being notified of a regulatory compliance inspections, i.e., OSHA, EPA, DOT, etc.

- 31.1.2** Managers, supervisors, persons in charge/foremen are accountable for ensuring their employees adhere to the policies and procedures contained herein and for contacting the regional safety manager and/or designated regional safety personnel immediately after being notified of an OSHA inspection. Upon notification of an OSHA inspection, immediate contact SHALL be made to the Corporate Safety Department.

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**31.2. RCI Procedure – OSHA – What to Expect**

- 31.2.1** The primary responsibility of the compliance officer is to conduct inspections to determine compliance with the rules, standards, and regulation promulgated under the OSH Act. Inspections are almost always conducted without prior notice.
- 31.2.2** The compliance officer will present his/her credentials to the ranking person at the facility/jobsite prior to entering for the inspection. The ranking company representative should always carefully check the compliance officer's credentials prior to any part of an inspection and document their name and badge number.
- 31.2.3** The compliance officer will conduct a joint opening conference with the employer and any employee representative. During the opening conference, the compliance officer will:
- 31.2.3.1 Inform the employer of the purpose of the inspection;
  - 31.2.3.2 Inform the employer of the scope of the inspection;
  - 31.2.3.3 List records that need to be reviewed;
  - 31.2.3.4 Indicate his/her obligation to interview employees;
  - 31.2.3.5 Indicate how the physical inspection will be conducted;
  - 31.2.3.6 Discuss the time and place of the closing conference;
  - 31.2.3.7 Furnish a copy of the complaint, if applicable, and;
  - 31.2.3.8 Answer any questions.

**31.2.4** The compliance officer may, during the course of the opening conference, request to review company records, such as OSHA 300 Logs, employee injury/illness reports, training records, safety meeting minutes, etc. The compliance officer may review, however do not release any written material that belongs to EEC without approval from the Corporate Legal Department or Corporate Safety Department.

31.2.4.1 Inform the compliance officer that prior to releasing any company materials/documents that EEC requires all such requests SHALL be made in writing.

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**31.3. Inspection of the Jobsite/Workplace**

**31.3.1** Once at the jobsite or inside the workplace, the compliance officer will normally take the time necessary to inspect all the company operations. The compliance officer will have or will obtain the necessary instruments to check electrical grounding, noise levels, toxic substances, air contaminants, and other items that may be found in the jobsite/facility. The main function of the OSHA inspection will be to note any apparent violation of the rules, regulations, and standards that have been promulgated under the OSH Act. The compliance officer's notes are the basis of information from which citations and penalties are issued. For this reason, it is important that the ranking company representative do the following:

31.3.1.1 The compliance officer is a guest on our job site. They should be treated with respect, not fear!



- 31.3.1.2 The supervisor/foreman SHALL hold a job briefing with the compliance officer before the inspection begins. As part of the job briefing let the compliance officer know that a change in condition has occurred with their presence. Inform the compliance officer that because they are on your jobsite you're now accepting responsibility for their safety, and as would be done with any outside visitor approaching our jobsite, we are to follow procedure by stopping the work. Indicate your willingness to cooperate, however let the compliance officer know that procedure requires the ranking company representative be contacted and present prior to commencement of inspection. Contact your supervisor at this time so they can be in route to meet with the compliance officer.
- 31.3.1.3 The ranking company representative SHALL notify the regional safety department and their manager immediately upon receipt of notification of an inspection. Regardless of the outcome of an inspection, notification of an inspection SHALL be made immediately to the VP of Corporate Safety by the responsible manager or designee.
- 31.3.1.4 Make sure that all parties have agreed on the scope of the inspection (ranking company representative and compliance officer). Ascertain nature and extent of inspection in terms of time and scope of inspection activity.
- 31.3.1.5 Ask how the job site was selected for inspection.
- 31.3.1.6 Cooperate with the compliance officer, but do not volunteer any information that is not requested by the compliance officer.
- 31.3.1.7 Make sure a ranking company representative accompanies the compliance officer at all times.
- 31.3.1.8 If the compliance officer asks to interview employees, inform the employees of their rights. They have the right to take part in the interview, refuse to be interviewed, or they can have a representative with them during the time of the interview. EEC requires that supervisors and persons in charge have a company representative while interviewed.

- 31.3.1.9 The compliance officer does not have the authority to control our employees.
- 31.3.1.10 Take detailed notes as to what observations the compliance officer has made, any questions which were asked, which employees the compliance officer spoke with, etc.
- 31.3.1.11 With respect to any samples taken, conduct parallel sampling. If possible do not permit sampling until you have had opportunity to have your own industrial hygienist available to perform parallel sampling.
- 31.3.1.12 The compliance officer cannot require you to demonstrate anything for his/her viewing. Demonstrations SHALL NOT be performed.
- 31.3.1.13 If the compliance officer asks you to remove employees from an unsafe situation, do not argue with him/her. Remove the employees from the alleged unsafe area. Do not admit guilt!
- 31.3.1.14 Always remember that compliance officers are people and will tend to react in kind to how they are treated. Therefore, be courteous and non-confrontational.
- 31.3.1.15 Take measurements in the same way, if possible.
- 31.3.1.16 If compliance officer asks you to agree with a measurement or that there is a violation, you have the right to not respond.
- 31.3.1.17 Take parallel videotape or still pictures of those items/areas that the compliance officer photographs. Ask the compliance officer, "Exactly what are you photographing/videotaping?" in order to take the same picture.
- 31.3.1.18 Take physical measurements in the same way as the compliance officer. Do not assist the compliance officer in taking measurements. If asked, state that company policy requires that you take your measurements and he/she should take their own.
- 31.3.1.19 Take notes on questions asked, as well as comments made throughout the inspection.

- 31.3.1.20 Once the compliance officer has completed the inspection, take him/her back to the designated meeting room for any further discussions.

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**31.4. Closing Conference**

- 31.4.1 When the inspection is completed, the compliance officer will conduct a closing conference with the employer and any employee representative. At this time, the compliance officer will inform those present of all conditions and practices that may constitute a safety or health violation.
- 31.4.2 At closing conference, first secure compliance officer's agreement that any comments/statements made by the company will not constitute admissions. Absent such agreement, do not make any statements that the company was not in compliance with applicable OSHA standards or regulations.
- 31.4.3 Ask the compliance officer to explain in detail what OSHA alleges to be violations of the act or its standards and specify the basis.
- 31.4.4 Ask the compliance officer to articulate specific abatement methods or alternatives. Do not volunteer abatement solutions yourself or commit to particular abatement steps or methods.
- 31.4.5 Ask the compliance officer to specify the time OSHA perceives as necessary for abatement and how it reached that determination.
- 31.4.6 Ask the compliance officer what classifications and penalties he or she intends to recommend; and when the company can expect to receive any OSHA citations that will issue.

**Attachment D - Substation A Project Execution Plan  
04.08.22**



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## 1.0 PROJECT OVERVIEW

### 1.1 1.1 Project information and Background

City of Independence has solicitation bidders to bid on the addition of (1) 20-MVAR capacitor bank at Substation A

### 1.2 Scope of Work Description

The scope of work includes the demolition of T1 & T1A along with its associated deluge system and bus duct. Installation of 20-MVAR Cap Bank, which includes: Relay Panel, Cable Tray, AC Panel, Control Cable, Grounding, Conduit, Bus/Jumpers, and (1) Foundation. All concrete and electrical testing as shown in the specification.

## 2.0 PROJECT MANAGEMENT

### 2.1 Team Members and Responsibilities

Emerald will utilize existing team members that have been previously working for EEC. Ryan Truitt will act as Project Manager and will be responsible for managing all subcontractors, vendors, financials, and schedule. Matthew Garner will act as Construction Manager and will be responsible for managing labor, equipment, and sequencing of activities. Jamie Smith will be the foreman on the project and will be responsible for all daily operations of the project. Jamie has been foreman for EEC for 3.5 years and is well versed in Cap Bank Installations.

### 2.2 Pre-Construction Meeting

To start this project, we will hold a Pre-Construction meeting. The purpose of this meeting will be to introduce the EEC team to the CoI team. We will also discuss our approach for Safety and Execution. We will also discuss all coordination efforts between the two parties. EEC will ensure that lines of communication are clear and established. The goal is to ensure that the CoI team understands the approach that EEC intends to use to successfully complete the project.

## 3.0 PROCUREMENT

### 3.1 Material Management Plan

EEC has partnered with PEAK substation Services to provide the contractor furnished materials. We will submit the material submittals and ensure all material is delivered to the site timely and efficiently.

### 3.2 Inspection



All materials, whether purchased by EEC or provided by CoI, will be inspected by the foreman onsite and will immediately be reported for non-conformance.

#### 4.0 CONSTRUCTION

##### 4.1 Temporary Facilities Plan

Once EEC mobilizes to the site, we intend to utilize a portion of the substation space to park our tool trailer and equipment trailer. EEC will bring in temporary restroom and trash facilities for use throughout the project.

##### 4.2 Construction Execution Plan

Once all material is ready for delivery, we will prepare for mobilization. We will mobilize in our crew and tool trailer along with skid steer and mini excavator. We will rent a forklift and man lift for use while onsite. Our next step will be to have the oil removed from the existing T1 and T1A Transformers. The oil will be put into tanks and hauled off site to be disposed of. This process will be performed by a subcontractor.

Once this is complete, EEC will begin the process of demo of the existing facilities. We will remove the existing bus ducts and the deluge system. EEC will require assistance from CoI to ensure that the deluge system is properly shut off prior to demolition. Once the bus duct is removed, EEC will seal the exterior wall penetration of the Power Plant. We will plan to use a gauged plate that will be welded in place to the existing thru-wall metal. EEC will then remove the control cable from the transformer. EEC will take special care in performing an OHM process to identify each cable on panel side to ensure everything is properly labeled before removal. After this, EEC will remove the existing overhead strain bus to allow for a crane to be used onsite for demolition of the existing transformers.

EEC will then subcontract the salvage of the existing transformer T1 and T1A. A crane will be brought in to assist with removal. For T1A, this transformer will be removed and hauled off in one piece. For T1, this transformer will need to be partially dismantled in place to remove enough weight to capable of being hauled off. Once both transformers are removed, EEC will begin the demo of the existing foundation for the deluge system. We will utilize a hammer on skid steer to break the foundation below grade. We will then re-install the strain bus back into its place.

Once the demo is complete, we will begin the process of installing the foundation. We intent to self-perform this scope. We will perform layout, form work, and rebar per the design drawings. Prior to placing concrete, we will submit a mix design for approval and submit the testing firm qualifications for approval as well. We will pour the concrete directly from the truck using its chute. As this foundation is curing, we will install the anchors in the existing foundations and begin the installation of the owner furnished cap bank structure.

We will uncrate the shipment and organize all parts once it has been delivered. This is to ensure that we review the shipment early in the process to confirm all material is delivered and in proper



working condition. We will begin by building the support frame and installing in place. We will immediately ground the frame once in its position. We will then lift the pre-assembled racks in place by use of a forklift. We will re-peat this for all 3 structures. Once the structures are in place, we will begin installing all ancillary equipment and bus work. Once complete, we will gravel the disturbed area back to its original condition.

After this is complete, our crew will then move into the control house and begin installation of the cable tray, owner furnished relay panel, and owner furnished AC panel. We will pull the cable from the cap bank to the control house and perform the wiring operation. Once all of this is complete, we will bring in a subcontractor to perform the testing of the installed equipment. All testing reports will be provided to CoI once complete.

#### 4.3 Subcontractor Plan

EEC plans to utilize a couple of vendors/subcontractors on the project. The scope that will be subcontracted is as follows:

- Material Packaging – PEAK Substation Services
- Oil Removal – Emerald Transformer or EMI of KC
- Transformer Salvage – Emerald Transformer or Sunbelt Solomon
- Rebar – TBD
- Concrete – TBD
- Concrete Tester – TBD
- Equipment Testing Firm – TBD

#### 4.4 Oil Removal Plan

EEC will be subcontracting out the removal of the oil from the existing T1 and T1A transformers. EEC is discussing this scope with (2) subcontractors: Emerald Transformer or EMI of KC. No PCB test report has been provided to EEC at this time. EEC has assumed and instructed both subcontracting firms to assume that the PCB levels are under the safe and legal limits for PCB's. If CoI cannot provide a test report, EEC will have a test performed to confirm the PCB levels. The cost of this test will be passed directly to the city at cost plus 15%. If the PCB levels are indeed safe and under the legal limit, then no further action will be necessary. If they are not, then we will need to discuss the proper steps to dispose of the oil. There could be potential cost impacts if PCB levels are shown to be over the legal limits.