Big Rivers ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
222710	0	1

VENDOR: BABCOCK POWER ENVIRONMENTAL INC
PO BOX 15040
WORCESTER, MA 01606

SHIP TO:
R. D. Green Station
9000 HWY 2096
Robards,KY 42452

BILL TO:
201 Third Street
Henderson,KY 42420

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO	DELIVER TO	DATE OF ORDER/BUYER	REVISED DATE/BUYER
65561		20-DEC-13 Toerne, Robert Frank	Toerne, Robert Frank
PAYMENT TERMS		BUYER TELEPHONE/FAX	F.O.B
30 NET DAYS		270-844-6029 888-268-6219	DESTINATION
FREIGHT TERMS		SHIP VIA	VENDOR CONTACT/TELEPHONE
ALLOWED/INCLUDED		BEST WAY POSSIBLE	(859) 647-1810

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

THE PARTIES AGREE THAT COMPANY IS SEEKING APPROVAL OF THE LANGUAGE IN PROJECT BR#13156; SECTION 2.7 OF FROM THE RUS ADMINISTRATOR. IF THE LANGUAGE IS NOT APPROVED BY THE RUS ADMINISTRATOR, THEN THE PARTIES WILL ADDRESS SUCH ACTION IN A MUTUALLY AGREEABLE MANNER.

Terms: Negotiated Terms on File.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	PROVIDE EQUIPMENT, MATERIALS AND SERVICES TO SUPPLY A DSI AND ACI SYSTEM FOR BREC'S G1&2 IN SUPPORT OF BREC'S MATS COMPLIANCE PROJECT AS PER THE CONFORMED PROJECT # BR13156 INCLUSIVE OF ALL CONFORMED APPENDICES. DELIVER TO:BERTRAM, MARK WAYNE		[redacted]	EACH	[redacted]	[redacted]
2.1	PROVIDE OUT OF SCOPE ENGINEERING AND EQUIPMENT FOR WORK APPROVED BY VP ENVIRONMENTAL SERVICES AND CONSTRUCTION ON TIME & MATERIALS/NOT TO EXCEED BASIS DELIVER TO:BERTRAM, MARK WAYNE The Parties agree that Company is seeking approval of the language in Project #BR13156; Section 2.7 from the RUS Administrator. If the language is not approved by the RUS Administrator, then the Parties will address such action in a mutually agreeable manner.		[redacted]	EACH	[redacted]	[redacted]

TOTAL [redacted]

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

Mercury and Air Toxics Standard (MATS) Compliance Project

Foundations
Contract 8220

RFQ #GN-14-021

Table of Contents
RFQ # GN-14-021

ATTACHMENTS

Documents: 73827.822.00400.Bid Form.xls
73827.822.00420.Clarifications and Exceptions.xls

PROJECT SUMMARY

Big Rivers Electric Corporation (Owner) is installing Dry Sorbent Injection (DSI) and Activated Carbon Injection (ACI) systems for Robert D. Green Generating Station (Green Station) Units 1 and 2. The addition of the DSI and ACI systems are intended to reduce mercury (Hg) emission to levels compliant with the Mercury Air Toxic Standards (MATS). DSI systems will be used to reduce SO_3 levels as necessary to improve the Hg removal efficiency of activated carbon. The DSI system will utilize hydrated lime for the reagent. The ACI system will utilize powdered activated carbon (PAC).

This Foundations Contract will furnish and install all of the foundations required for this Project. The foundations to be installed include the following:

- Silo/Stairtower Foundation – A pile supported foundation (piling by others) that supports 4 silos, the stair tower, pipe rack columns, and miscellaneous equipment.
- Retaining walls and retaining wall foundation – To be constructed at the bottom of an existing slope such that the wall can be backfilled and the area used to support equipment.
- Equipment pad foundation with equipment pedestals – Slab on grade where most of the equipment will be located.
- Pipe rack foundations – soil bearing foundations used to support the pipe rack.

Other work associated with the Foundations Contract includes:

- All anchor bolts associated with the foundations.
- Excavation, soil compaction, and backfill.
- Demolition of existing temporary drainage trench and installation of a new concrete trench.
- Electrical grounding.
- Drainage pipe to be embedded in silo foundation.

1. DEFINITIONS

1.1. "Addenda" - written or graphic changes or interpretations of the Contract Documents issued by Owner prior to the opening of Bids.

1.2. "Administrator" shall mean the Administrator of the Rural Utilities Service of the United States of America and his or her duly authorized representative or any other person in whom or authority in which may be vested the duties and functions which the Administrator is now authorized by law to perform.

1.3. "Agreement" or "Contract" - the written agreement between Owner and Bidder covering the Work to be performed. Other Contract Documents are attached to the Contract and made a part thereof as provided therein.

1.4. "Application for Payment" - the form acceptable to Owner and Engineer which is to be used by Bidder during the course of the Work in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

1.5. "Bid" - the formal offer of the Bidder submitted on the prescribed Bid Form and all information submitted with the Bid that pertains to performance of the Work.

1.6. "Bidder" – Prior to Contract award, "Bidder" is any person, firm, or corporation submitting a Bid for the Work or their duly authorized representative. Upon Contract award, "Bidder" is the person, firm or corporation with whom the Owner has entered into the Contract.

1.7. "Change Order" - a written document recommended by Engineer which is signed by Owner and Bidder and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Time or other material provision issued on or after execution of the Contract.

1.8. "Company" – Big Rivers Electric Corporation, also referred to as "BREC", "Big Rivers", or "Owner".

1.9. "Contract" or "Agreement" - the written agreement between Owner and Bidder covering the Work to be performed. Other Contract Documents are attached to the Contract and made a part thereof as provided therein.

1.10. "Contract Documents" - RUS Form 198 or RUS Form 200, all documents referenced in the table of contents, exhibits, attachments, affidavits, bonds, insurance requirements and documents, releases, Specifications, drawings, and Change Orders or signed amendments issued to the Contract.

1.11. "Contract Time" - the number of days or the dates stated in the Contract Documents for the completion of the Work.

1.12. "Contractor" - is the person, firm or corporation with whom the Owner has entered into the Contract.

1.13. "Date of Contract" - the date on which the Contract is signed and executed by the Owner.

1.14. "Day" or "Days" - a calendar day of 24 hours measured from midnight to the next midnight.

1.15. "DDP" (Delivered Duties Paid) (Incoterms 2000) Point of Delivery - The Contract Price includes all costs of transporting Equipment and Materials to the named Point of Delivery, including but not limited to any duties, permits, and insurance for the full value of the Equipment and Materials being delivered.

1.16. "Defective" - an adjective which when modifying the words Equipment and Materials, or Field Services refers to Equipment and Materials or Field Services which do not conform to the Contract Documents, or do not meet the requirements of any inspection reference standard, test, or approval referred to in the Contract Documents.

1.17. "Effective Date of the Contract" – the date of Acceptance of Contract by Owner or if approval by the Administrator is required, the date of approval by the Administrator in accordance with RUS Form 198 or RUS Form 200.

1.18. "Engineer" shall mean the Engineer employed by the Owner to provide engineering services for the project and said Engineer's duly authorized assistants and representatives. For this Project, "Engineer" means Burns & McDonnell Engineering Company, Inc. a Missouri Corporation, with offices at 9400 Ward Parkway, Kansas City, Missouri 64114.

1.19. "Equipment" - a product with operational or nonoperational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.20. "Field Services" - services to be furnished by Contractor at the Site as required by the Contract Documents.

1.21. "Final Acceptance" - shall mean the point after Substantial Competition when Contractor has (i) completed all punch list items; (ii) delivered to Owner all final documentation; and (iii) met all requirements associated with Liquidated Damages or paid the applicable damages.

1.22. "Force Majeure" - any condition, event or circumstance, including the examples set forth below, but only if, and to the extent (i) such condition, event or circumstance is not within the reasonable control of the Party affected, (ii) such condition, event or circumstance, despite the exercise of reasonable diligence, cannot be prevented, avoided or removed by such Party, (iii) such condition, event or circumstance materially adversely affects the ability of the affected Party to fulfill its obligations under this Agreement, (iv) the affected Party has taken all commercially reasonable precautions, due care and commercially reasonable alternative measures in order to avoid the effect of such condition, event or circumstance on the affected Party's ability to fulfill its obligations under this Agreement and to mitigate the consequences thereof and (v) such condition, event or circumstance is not the result of any failure of such Party to perform any of its obligations under this Agreement. By way of example, such events, conditions and circumstances shall include war,

rebellion, sabotage, riots, insurrection, public disorder, fires, floods, volcanic eruption, tidal wave, earthquake, quarantine, explosions or other natural catastrophes or Acts of God, and changes in applicable Laws or Regulations after the Effective Date of the Contract.

1.23. "Laws and Regulations"/ "Laws or Regulations" - laws, rules, regulations, ordinances, codes and/or orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

1.24. "Liquidated Damages" – payments which the Contractor shall make to the Owner for the value of damages experienced by the Owner to compensate for additional operational expenses or missed delivery schedules defined within the Contract.

1.25. "Materials" - products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.

1.26. "Notice to Proceed" - the written notice by Owner to Bidder fixing the date on which the Contract Time will commence to run and on which Bidder shall start to perform Bidder's obligation under the Contract.

1.27. "Owner" – Big River Electric Corporation, also referred to as "BREC", "Big Rivers", or "Company".

1.28. "Point of Delivery" – the place designated where the Equipment and Materials are to be delivered, being:

1.28.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

1.29. "Parties" - Owner and Bidder, each of which is individually a "Party".

1.30. "Payment and Cancellation Schedule" - the detailed listing of activities or milestones with an associated payment percentage of the total Contract Price which accurately reflects payment for Work accomplished and cancellation percentage of the total

Contract Price which reflects the payment(s) agreed to between the Parties in the event of cancellation. This schedule shall be jointly developed and agreed to by Owner and Contractor.

1.31. "Project" - the total construction of which the Work to be provided under the Contract may be the whole, or a part as indicated elsewhere in the Contract.

1.32. "Reference Drawings" - drawings not specifically prepared for this Contract, but which contain information pertinent to the Work.

1.33. "Samples" - physical examples of Equipment, Materials, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

1.34. "Shop Drawings" - all drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

1.35. "Site", "Job Site" or "Point of Delivery" - the Owner's Station where Material and Equipment is being delivered, being:

1.35.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

1.36. "Specifications" - those portions of the Contract Documents consisting of written technical descriptions of the Work, and covering the Equipment, Materials, workmanship, performance and certain administrative details applicable thereto.

1.37. "Subcontractor" - an individual, firm, or corporation having a direct contract with Contractor to perform a portion of the Work.

1.38. "Submittals" - all Shop Drawings, product data, and Samples which are prepared by Contractor, a Subcontractor, manufacturer or Supplier, and submitted by Contractor to Owner and Engineer as a basis for approval of the use of Equipment and Materials

proposed for incorporation in the Work or needed to describe proper installation, operation, and maintenance, or technical properties.

1.39. "Substantial Completion" - the event when, as determined in Owner's reasonably exercised discretion, (i) erection or installation of the Equipment and Materials furnished under the Contract has been completed by the installing Contractor and required Field Services have been furnished; (ii) all testing of the Work has been completed and all test data properly evaluated; (iii) the guarantees have been verified by Owner and Engineer and the warranty period has commenced; and (iv) Contractor has delivered to Company any operating instructions, maintenance manuals, and warranties.

1.40. "Supplier" - a manufacturer, fabricator, supplier, distributor, material man, or vendor of Bidder or Contractor.

1.41. "Work" - the goods and all services required by the Contract, and includes all labor, Materials, Equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations herein. The Work may constitute the whole or a part of the Project.

2. OVERVIEW

2.1. The Contractor shall furnish, deliver (DDP Point of Delivery), and install all Equipment and Material in accordance with the requirements of this Contract.

2.2. Robert D. Green Generating Station consists of Unit 1 and Unit 2 which are 250 MW and 242 MW pulverized coal-fired balanced draft natural circulation, wall fired units provided by Babcock & Wilcox in 1976. Both units have two air preheaters and two electrostatic precipitators downstream of the economizers, and two wet FGD scrubbers which run at all times the units are online. Green burns a blend of bituminous coal and petroleum coke with a range of 0% - 27% petroleum coke in the blend. Fuel range and analyses are provided in Appendix 011101-A of the Engineer's Specification.

2.3. If any conditions, circumstances or occurrences not covered in the Specification are encountered, or if there are any doubts as to the meaning, please contact the Rob Toerne at (270) 844-6029 or rob.toerne@bigrivers.com. Clarifications or explanations may result in an addendum to the RFQ.

2.4. The Contractor shall abide by the items in this Specification unless Big Rivers agrees in writing to any changes. Changes must be made in the form of a written request.

2.5. Big Rivers Electric Corporation reserves the right to reject any or all Bids, to waive informalities therein and to consider exceptions and clarifications therein in order to determine the lowest and best bid; to reject any or all non-conforming, non-responsive, unbalanced or conditional Bids; to reject the Bid of any Contractor that it would not be in the best interest of the Project to make an award to that Contractor, whether because the Bid is not responsive or the Contractor is unqualified or of doubtful financial ability, or fails to meet any other pertinent standard or criteria established. The Company also reserves the right to negotiate contract terms with the successful Contractor. By submitting a Bid, the Contractor agrees that such procedures will be without liability for any damage or claim brought by the Contractor because of such rejections or procedures, nor will the Contractor seek any recourse of any kind against the Company because of such rejections or procedures. The filing of any Bid in response to this Invitation will constitute an agreement of the Contractor to these conditions.

3. PROPOSAL PREPARATION AND SUBMITTAL

3.1. A mandatory pre-bid meeting will be held on April 9, 2014 at Big Rivers Green Station starting at 8:30 AM CT.

3.2. All bids will be valid for ninety (90) days from the opening of the bid.

3.3. The Bidders must complete and submit all documents identified as submittals within this document including, but not limited to;

a. Document 0040 - BID FORM for Contract 8220 of the Engineer's Specification
b. Exhibit 1 –Clarifications and Exceptions for Contract 8220 of the Engineer's Specification.
c. Big Rivers Contractor Safety Credentials Assessment Program
d. RUS Equal Opportunity Form 270
e. RUS Certification Relating to Lobbying
f. RUS Certification Regarding Debarment Form AD-1048
g. Big Rivers New Vendor Information Form
h. IRS Form W-9

3.4. The Bidders must submit a preliminary Payment Schedule paired with readily identifiable milestone events.

3.5. The Bidder may submit a list of any Subcontractors that might be used for this project for pre-approval. The submittal must include experience lists and reference contacts for all proposed Subcontractors.

3.6. Any deviations from or exceptions to the attached Specification, terms and conditions, or the Submittals may impact the evaluation of the Bidder's proposal. If there are no exceptions or clarifications please so indicate on the Clarifications & Exceptions Form. Any exception taken to the Specification must be justified in writing, i.e., safety, reliability, efficiency, and increase or decrease in cost and identified on Clarifications & Exceptions Form.

3.7. Any addenda to this request for quotation (RFQ) shall be signed by the Bidder and will be returned with the proposal.

3.8. The Bidder will submit sufficient information and detail with the bid to permit full understanding and evaluation of the Equipment, Materials, and services being offered.

3.9. The attached Big Rivers Submittal Sheet should be used as the submittal sheet for a firm dollar cost to provide Equipment and Materials as specified with any additional and/or optional pricing attached thereto. The Bidder may submit alternate bids

showing detailed options, however, alternates will be considered only if a complete original bid is submitted.

3.9.1. The Bidder will also provide a cost plus percentage markup for any materials that may be needed for additional/emerging work for this Project. This percentage is to be factored on the base cost of the material before taxes are applied.

a. In the event of additional/emerging work, the Bidder shall attempt to obtain sufficient information to present a firm dollar quote. No additional work will be performed until the Bidder has been given written authorization to proceed by Big Rivers.

3.10. The proposal shall be submitted by post, courier, or hand delivered in a sealed envelope marked prominently with the RFQ number GN-14-021. **Bid Proposal must be received no later than April 25, 2014 by 3:00 p.m. (Central Time).** Bid proposals received after this date and time will be returned and will not be considered. The bid proposal shall consist of three hard copies and one electronic copy (DVD, CD or thumb drive) and shall be submitted to the Big Rivers Supply Chain Department at the following address:

3.10.1. Big Rivers Electric Corporation
Attn: Rob Toerne
201 Third Street
Henderson, KY 42420

3.11. This inquiry implies no obligation on the part of Big Rivers. The Bidder offers the prices, terms, and delivery freely and without bias.

3.12. All expenses incurred by the Bidder in the development of this bid are the sole responsibility of the Bidder.

3.13. The evaluation methodology that will be used to identify the winning bid includes, but is not limited, to the following four elements: Non-Responsiveness Evaluation, Price Evaluation, Qualification/Certification Evaluation, and Technical Evaluation.

The purpose of each element and the process employed in each are described in the following sections.

3.13.1. Non-Responsiveness Evaluation: The Non-Responsiveness Evaluation is designed to identify and eliminate any proposal that has not provided the requested information in a proper format to allow an equitable evaluation to occur or that does not meet the requirements set forth in this RFQ. A bid deemed non-responsive by Big Rivers may be rejected. Bidders are subject to disqualification for such things as failure to submit the proposal on or before the designated time and date. Big Rivers Electric Corporation may, in its discretion, disqualify a bid and drop it from further consideration for failure to submit a complete proposal in the form required or failure to provide additional supporting documentation or any clarification that may be requested by Big Rivers subsequent to the submission of the proposal.

3.13.2. Price Evaluation: The Price Evaluation is designed to identify and eliminate bids which are clearly more expensive than other compliant proposals received. This will be accomplished by ranking the bids, as well as the designated options, against each other according to price. Preliminary estimates of production cost effects, operation and maintenance costs, and other pertinent costs will be made and added to each proposal for evaluation purposes. The evaluation will also include an estimate of the negative impact of deviations or exceptions, if any, to the terms and conditions in the proposed Contract or in other agreements contemplated to be entered into. Big Rivers expects the bid to contain an early payment discount structure which terms will also be part of the evaluation.

3.13.3. Qualification/Certification Evaluation: The Qualification/Certification Evaluation is designed to identify and eliminate bids that clearly demonstrate a lack of understanding or an inability to meet the intended Specification for this project. Big Rivers Electric Corporation requires all on-site contractors to complete the Contractor Certification process before any on-site work is awarded.

3.13.4. Technical Evaluation: The Technical Evaluation will consist of a comprehensive review that considers a number of price and non-price factors. The goal of the Technical Evaluation is to determine the options that best meet the needs of Big Rivers for this project and technical options which improve the facility's overall cost, reliability and availability.

3.14. The Contractor will, within 14 days after Notice to Proceed, submit a Certificate of Insurance naming Big Rivers Electric Corporation as the holder of the certificate. The certificate will also show Big Rivers Electric Corporation and Engineer as additional insureds. Insurance coverage must meet as a minimum, the insurance requirements as specified in Section 7.21 of this document.

3.15. The Contractor will, within 10 business days after Notice to Proceed, submit performance and payment bonds (Bonds), each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Bidder's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Laws or Regulations or by the Contract Documents.

3.15.1. All Bonds shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury.

3.15.2. The Bonds shall be automatically increased in amount and extended in time without formal separate amendments to cover full and faithful performance of the Contract in the event of Change Orders, regardless of the amount of time or money involved. It is Contractor's responsibility to notify its surety of any changes affecting the general scope of the Work or change in the Contract Price or Contract Time. All Bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

3.15.3. If at any time during the continuance of the Contract, the surety on any Bond becomes unacceptable to Owner for financial reasons, Owner has the right to

require additional and sufficient sureties, which Contractor shall furnish to the satisfaction of Owner within ten (10) Days after notice to do so.

3.15.4. If the surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of the Contract, Contractor shall within five (5) Days thereafter substitute another Bond and surety, both of which must be acceptable to Owner.

4. SCHEDULE REQUIREMENTS

4.1. The time of completion of the Work is a basic consideration of the Specification. Time is of the essence of this Agreement. The proposal will be based upon completion of the Work as referenced by Section 011100, Entry 1.09 of the Engineer's Specification. Contractor's preliminary schedule and support requirements must be defined and submitted to Big Rivers and the Engineer for approval. A final, mutually agreed and approved schedule must be met.

4.2. The Contractor will provide a bi-weekly project status update to the designated Big Rivers representative.

4.3. The Contractor will adhere to the schedule. Schedules provided with the proposal or within this Specification may be updated prior to the Project. The Contractor will take any and all actions necessary to ensure scheduled completion.

4.4. The Contractor shall maintain, throughout the duration of the job, a schedule with the work progression of individual job elements. The schedule will be up-dated regularly and will be available to Big Rivers for review at any time. The schedule will be broken down to show individual job elements.

4.5. If at any time during the progress of the Work it is determined that the scheduled completion date cannot be met, Big Rivers reserves the right to take any action it deems necessary to ensure timely completion.

5. PLANT SITE REQUIREMENTS

5.1. Big Rivers is committed to procuring safe results for all Purchase Orders. The Contractor and every on-site employee must be certified through and current with Big Rivers' Contractor Safety Credentials Assessment Program (C-SCAP). Contractor will comply with all applicable OSHA, KOSHA, EPA, Big Rivers' rules or other safety practices, rules and regulations that govern work while on the Big Rivers' sites.

5.1.1. The Contractor's on-site employees will be in compliance with all C-SCAP requirements.

5.1.2. Big Rivers may stop work and/or remove the offending party from the worksite if that party fails to observe safety requirements.

5.2. The Contractor will provide all necessary supervision, labor, job management, Materials, tools, Equipment and consumables deemed necessary to ensure safe, proper and timely completion of the specified work.

5.3. The Contractor will utilize all of the information presented in this document to be fully prepared to begin work at the specified commencement date and time. The Contractor will ensure that a copy of this document has been reviewed by and is in the possession of the on-site manager.

5.4. The Contractor will ensure that all instructions and emergency warnings can be effectively and immediately communicated to all employees. Unless otherwise instructed Big Rivers requires that one (1) interpreter be provided for every eight (8) non-English speaking employees.

5.5. The Contractor will provide all necessary personnel protective equipment for each of its employees along with documentation of proper training in the use of said equipment.

5.6. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the Contractor.

5.7. The Contractor will protect its own employees and its Subcontractors' employees and be responsible for their work until Big Rivers' acceptance of the entire Project, and to protect Big Rivers' facilities, property, employees and third parties from damage or injury.

5.8. The Contractor will inform Big Rivers of any hazardous chemicals that will be transported or used on the plant site. Material Safety Data Sheets (MSDS) must be provided to the Owner's Site safety representative prior to use on the plant site and must be available at all times while on the plant site.

5.9. The Contractor will comply with the latest or amended version of the followings standards and codes, and with any and all other standards and codes that may be applicable:

- 5.9.1. National Fire Protection Association (NFPA)
- 5.9.2. National Electrical Code (NEC)
- 5.9.3. National Electrical Manufacturers Association (NEMA)
- 5.9.4. Electrical Apparatus Service Association (EASA)
- 5.9.5. International Electrical Testing Association (NETA)
- 5.9.6. Factory Mutual (FM)

5.10. The Contractor will notify the designated Big Rivers representative upon completion of each phase of the Work.

5.11. The Contractor will ensure that all discarded material and trash is removed from the site or placed in an approved dumpster.

- 5.11.1. Big Rivers may provide on-site dumpsters for the disposal of non-hazardous waste material. Debris must not be stacked beyond the top of the dumpster.

5.12. The Contractor will not discharge petroleum products anywhere on the plant site. Fuel, lubrication products and any other liquid consumables stored on-site will be in an appropriate tank or container with proper labeling. Use of the proper container and the Big Rivers' approval of such containers in no way releases the Contractor from its responsibility to clean up any spills, discharges, or other releases.

5.13. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers and promptly repaired or replaced by the Contractor. During the project, unanticipated repairs or work may be encountered. If such needs are discovered during the project, they will be communicated to the designated Big Rivers representative by the Contractor's on-site supervisor as soon as possible.

5.13.1. The Contractor will obtain sufficient information to present a firm dollar quote for any emerging work for this project.

5.13.2. No additional work will be performed until the Contractor has been given written authorization to proceed by the Big Rivers.

5.14. The Contractor will exercise care in the protection of Materials and Equipment furnished under this Contract.

5.15. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the

6. PLANT SITE SUPERVISION

6.1. The Contractor will designate an on-site contact person with the authority to make decisions, correct problems and generally oversee the Contractor's equipment. In the event the contact person is absent from the job site, an alternate contact person with full authority to make decisions will be available onsite during all activities relating to this project.

6.1.1. There will be a designated Big Rivers representative on site, during day shift, to coordinate work schedules, safety issues, etc.

6.2. The Contractor will provide in writing the name and phone number (office, home, pager and mobile as applicable) of the contact person and the alternate contact person(s) prior to the start of Work hereunder and within one working day of any changes in the previously designated contact person.

6.3. To the extent possible, the on-site contact person will be the same from week to week to ensure job continuity.

6.4. The Contractor will provide an after-hours, emergency 24-hour per day contact list. The list will be prioritized as to the order that should be followed in notifying the Contractor.

7. COMMERCIAL TERMS

7.1. Submittal based Liquidated Damages will be assessed at a rate of $500 per day for the first five days and $1,000 per day upon and after six days, retroactive to the first day for each of the items referenced in Appendix 013300-A of the Engineer's Specification as being subject to Liquidated Damages.

7.2. The time of the completion of this Foundation Contract 8220 is of great importance to the Project. Should the Bidder neglect, refuse, or fail to deliver and install the foundations as provided in and defined by this RFQ within the time herein agreed upon, after giving effect to extensions of time, if any, then, in that event and in view of the difficulty of estimating with exactness damages caused by such delay, the Owner shall have the right to deduct from and retain out of such moneys which may be then due, or which may become due and payable to the Bidder the amounts defined within this section for each and every day that such completion is delayed beyond the specified time, as liquidated damages and not as a penalty; if the amount due and to become due from the Owner to the Bidder is insufficient to pay in full any such liquidated damages, the Bidder shall pay to the Owner the amount necessary to effect such payment in full: Provided, however, that the Owner shall promptly notify

the Bidder in writing of the manner in which the amount retained, deducted or claimed as liquidated damages was computed. In no event shall Contractor be liable for delay damages if Company's ability to conduct commercial operations of its unit(s) is not harmfully reduced, impeded, delayed or otherwise adversely affected by Contractor's failure to achieve the schedule guarantees herein. Liquidated Damages will be assessed at the rate for each of the items listed below as referenced in Section 011100, Entry 1.09 of the Engineer's Specification:

7.2.1. Section 011100, Entry 1.09; Item C.5.

A. $5,000 per day

7.2.2. Section 011100, Entry 1.09; Item C.8.

A. $10,000 per day

7.2.3. Section 011100, Entry 1.09; Item C.9.

A. $1,000 per day

7.3. Retention

10% of the Contract value will be held as retention until Owner and Engineer have determined the Project to be Substantially Complete with Final Acceptance.

7.4. Warranties

7.4.1. All Materials and Equipment furnished hereunder shall be subject to the inspection, tests, and approval of the Owner and the Engineer, and the Contractor shall furnish all information required concerning the nature or source of any Materials and Equipment and provide adequate facilities for testing and inspecting the Materials and Equipment at the plant of the Contractor.

7.4.2. Contractor warrants that:

a. the Work will conform to any applicable Specification; and any Materials and Equipment supplied in connection therewith shall be new, unused, and free from defect;

b. the Work will be suitable for the purposes specified by Company and will conform to each statement, representation, and description made by Contractor to Company;

c. the Work is not and shall not be subject to any encumbrance, lien, security interest, patent, copyright or trademark claims, infringements, or other defects in title; and

d. any labor or services performed pursuant to this Agreement shall be performed in a competent, diligent, and timely manner in accordance with the highest professionally accepted standards.

7.4.3. The Work furnished hereunder shall become the property of the Owner upon delivery, provided, however, that the Owner or the Engineer, within two years after initial operation of the Project, or within the period for which the Material and Equipment is guaranteed, whichever is longer, may reject any Materials or Equipment which does not comply with the Specifications made a part hereof or with the guarantees, if any, of the Contractor and the manufacturer. Upon any such rejection, the Contractor shall repair or replace such defective Material or Equipment within a reasonable time after notice in writing from the Owner. If any such defective Materials, Equipment, or workmanship so replaced or repaired is found to be defective within two years after the completion of the replacement or repair, the Contractor shall replace or remedy such defective Materials, Equipment, or workmanship. In the event of failure by the Contractor so to do, the Owner may make such replacement and the cost and expense thereof shall be paid by and recoverable from the Contractor.

7.4.4. Contractor shall respond in writing to any warranty claim by Company within five (5) business days of the delivery of notice of such claim to Contractor.

7.4.5. All manufacturers' guarantees of Equipment, if any, shall be transferred and assigned to the Owner upon delivery of any Equipment and before final payment is made for such Equipment.

7.4.6. The term of the Warranty is two years from the time of acceptance by the Owner and Engineer.

7.5. Materials and Supplies.

In the performance of this Contract there shall be furnished only such

unmanufactured articles, Materials, and supplies as have been mined or produced in the United States or in any eligible country, and only such manufactured articles, materials, and supplies as have been manufactured in the United States or in any eligible country substantially all from articles, materials, or supplies mined, produced or manufactured, as the case may be, in the United States or in any eligible country; provided that other articles, materials, or supplies may be used in the event and to the extent that the Administrator shall expressly in writing authorize such use pursuant to the provisions of the Rural Electrification Act of 1938, being Title IV of Public Resolution No. 122, 75th Congress, approved June 21, 1938. For the purposes of this section, an "eligible country" is any country that applies with respect to the United States an agreement ensuring reciprocal access for United States products and services and suppliers to the markets of that country, as determined by the United States Trade Representative. The Bidder agrees to submit to the Owner such certificates with respect to compliance with the foregoing provision as the Administrator from time to time may require.

7.6. Conditions of Risk and Work

Unless the applicable Statement of Work expressly provides otherwise, Contractor agrees that before beginning any Work, Contractor shall carefully examine all conditions relevant to such Work and its surroundings, and, unless Contractor notifies Company in writing that it will not perform the Work under such conditions, Contractor shall assume the risk of such conditions and shall, regardless of such conditions, the expense, or difficulty of performing the Work, fully complete the Work for the stated Contract Price applicable to such Work without further recourse to Company. Without limiting the foregoing, Contractor specifically recognizes that Company and other parties may be working concurrently at the site. Information on the site of the Work and local conditions at such site furnished by Company in Specifications, drawings, or otherwise is made without representation or warranty of any nature by Company, is not guaranteed by Company, and is furnished solely for the convenience of Contractor. All drawings and other documents, if any, required to be submitted to Company for review shall be submitted in accordance with the mutually agreed to schedule, and, if no schedule applies, such drawings or other documents shall be submitted by Contractor without unreasonable delay. No Work affected by such drawings and other documents shall be started until Contractor is

authorized to do so by Company. In case of a conflict between or within instructions, Specifications, drawings, schedules, or Purchase Order(s), Company shall resolve such conflict; and Company's resolution shall be binding on Contractor.

7.7. Company Changes in Work

The scope of and conditions applicable to the Work shall be subject to changes by Company from time to time. Such changes shall only be enforceable if documented in a writing executed by Company. Except as otherwise specifically set forth in this Agreement, changes in the scope of or conditions applicable to the Work may result in adjustments in the Contract Price and/or the Work schedule in accordance with this Article. If Contractor believes that adjustment of the Contract Price or the Work schedule is justified, whether as a result of a change made pursuant to this Article or as a result of any other circumstance, then Contractor shall (a) give Company written notice of its claim within five (5) business days after receipt of notice of such change or the occurrence of such circumstances and (b) shall supply a written statement supporting Contractor's claim within ten (10) business days after receipt of notice of such change or occurrence of such circumstances, which statement shall include Contractor's detailed estimate of the effect on the Contract Price and/or the Work schedule. Contractor agrees to continue performance of the Work during the time any claim hereunder is pending. Company shall not be bound to any adjustments in the Contract Price or the Work schedule unless expressly agreed to by Company in writing. Company will not be liable for, and Contractor waives, any claims of Contractor that Contractor knew or should have known and that were not reported by Contractor in accordance with the provisions of this Article.

7.8. Force Majeure

Neither party shall be liable to the other for any damages for any failure to perform or for any delays or interruptions beyond that party's reasonable control in performing any of its obligations under this Agreement due to Force Majeure, unless the time to perform is expressly guaranteed. Contractor shall advise Company immediately of any anticipated and actual failure, delay, or interruption and the cause and estimated duration of such event. Any such failure, delay, or interruption, even though existing on the date of this Agreement or on the date of the start of the Work, shall require Contractor to within five (5) days submit a recovery plan detailing the manner in

which the failure, delay, or interruption shall be remedied and the revised schedule. This Article shall apply only to the part of the Work directly affected by the particular failure, delay, or interruption, and shall not apply to the Work as a whole or any other unaffected part thereof.

7.9. Contractor Delays

Contractor agrees to cooperate with Company in scheduling the Work so that the Project and other activities at Company's site will progress with a minimum of delays. Company shall not be responsible for compensating Contractor for any costs of overtime or other premium time work unless Company has provided separate prior written authorization for additional compensation to Contractor, and, if Company provides such written authorization, such additional compensation shall be limited to Contractor's actual cost of the premium portion of wages, craft fringe benefits, and payroll burdens. Contractor shall be liable for all failures, delays, and interruptions in performing any of its obligations under this Agreement which are not (a) caused by Company and reported in accordance with Article 7.8, (b) excused by Article 7.9, or (c) directed by Company pursuant to Article 7.11. Contractor shall, without adjustment to completion date or Contract Price, be obligated to make up time lost by such failures, delays, or interruptions. Company may suspend payments under this Agreement during the period of any such failure, delay, or interruption.

7.10. Company Extensions

Company shall have the right to extend schedules or suspend the Work, in whole or in part, at any time upon written notice to Contractor (except that in an emergency or in the event that Company identifies any safety concerns, Company may require an immediate suspension upon oral or written notice to Contractor). Contractor shall, upon receipt of such notice, immediately suspend or delay the Work. Contractor shall resume any suspended Work when directed by Company. If Contractor follows the requirements of Article 7.8, a mutually agreed equitable adjustment to the Contract Price or to the schedules for payments and performance of the remaining Work may be made to reflect Company's extension of schedules or suspension of the Work. Contractor shall provide Company all information Company shall request in connection with determining the amount of such equitable adjustment.

7.11. Right of Inspecting and Testing

Company reserves the right, but shall not be obligated, to appoint representatives to follow the progress of the Work with authority to suspend any Work not in compliance with this Agreement. The appointment or absence of an appointment, of such representatives by Company shall not have any effect on warranties. Acceptance or approval by Company's representative shall not be deemed to constitute final acceptance by Company, nor shall Company's inspection relieve Contractor of responsibility for proper performance of the Work. Inspection by Company's representative shall not be deemed to be supervision or direction by Company of Contractor, its agents, servants, or employees, but shall be only for the purpose of attempting to ensure that the Work complies with this Agreement. In the event Contractor fails to provide Company with reasonable facilities and access for inspection when advised, and if in the opinion of Company it becomes necessary to dismantle the Work for such inspection, then Contractor shall bear the expenses of such dismantling and reassembly.

7.12. Right of Auditing

Contractor shall maintain complete records relating to any cost-based (i.e., Work not covered by firm prices) components of the Work billed under this Agreement or relating to the quantity of units billed under any unit price provisions of this Agreement (all the foregoing hereinafter referred to as "Records") for a minimum of five years following the latest of performance of, delivery to Company of, or payment by Company for, such Work or units. All such Records shall be open to inspection and subject to audit and reproduction during normal working hours, by Company or its authorized representatives to the extent necessary to adequately permit evaluation and verification of any invoices, payments, time sheets, or claims based on Contractor's actual costs incurred in the performance or delivery of Work under this Agreement. For the purpose of evaluating or verifying such actual or claimed costs, Company or its authorized representative shall have access to said Records at any time, including any time after final payment by Company to Contractor pursuant to this Agreement. All non-public information obtained in the course of such audits shall be held in confidence except pursuant to judicial and administrative order. Company or its authorized representative shall have access, during normal working hours, to all necessary Contractor facilities and shall be

provided adequate and appropriate work space to conduct audits in compliance with the provisions of this Article. Company shall give Contractor reasonable notice of intended audits. The rights of Company set forth in this paragraph shall survive the termination or expiration of this Agreement.

7.13. Use of Tools and Equipment

Company, in its sole discretion, may allow Contractor to use Company's tools and equipment for the Work and related activities at designated Company locations. Contractor shall indemnify and hold harmless Company and its Affiliates, including their respective officers, directors, shareholders, agents, members and employees (each an "Indemnified Party"), from and against any and all claims, damages, losses or liabilities arising out of, relating to, or in connection with, the use of Company's tools and equipment by Contractor, its agents, servants, employees or subcontractors, and will reimburse each Indemnified Party for all expenses (including attorney's fees and expenses) as they are incurred in connection with investigating, preparing or pursuing or defending any action, claim, suit or investigation or proceeding related to, arising out of, or in connection with, the use of Company's tools and equipment by Contractor, its agents, servants, employees or subcontractors, whether or not threatened or pending and whether or not any Indemnified Party is a party. Contractor, on behalf of itself or its agents, affiliates, officers and directors, and all of their predecessors, successors, assigns, heirs, executors and administrators, hereby irrevocably release, discharge, waive, relinquish and covenant not to sue, directly, derivatively or otherwise, Company and/or its Affiliates and each of their respective directors, officers, shareholders, members, partners (general or limited), employees and agents (including, without limitation, its financial advisors, counsel, proxy solicitors, information agents, depositories, consultants and public relations representatives) and all of their predecessors, successors, assigns, heirs, executors or administrators, and all persons acting in concert with any such person , with respect to any and all matters, actions causes of action (whether actually asserted or not), suits, damages, claims, or liabilities whatsoever, at law, equity or otherwise, arising out of, relating to, or in connection with the use of Company's tools and equipment by Contractor, its agents, servants, employees or subcontractors. Company shall in no event be liable for any claim whatsoever by or through Contractor, its employees, agents and/or subcontractors or by any third party, for any inoperability or failure of

the tools and equipment to perform as designed or intended, whether such claim is based in warranty, contract, tort (including negligence), strict liability or otherwise and whether for direct, incidental, consequential, special, exemplary or other damages. Contractor shall ensure that its employees, agents, subcontractors or servants shall inspect, exercise the appropriate level of care in the use, maintenance and repair of the tools and equipment, so as to minimize the incidence of casualties and injuries occurring in connection therewith.

7.14. Applicable Laws and Safety

Contractor agrees to protect its own and its Subcontractors' employees and be responsible for their Work until Company's acceptance of the entire Project and to protect Company's facilities, property, employees, and third parties from damage or injury. Contractor shall at all times be solely responsible for complying with all applicable Laws and Regulations and facility rules, including without limitation those relating to health and safety, in connection with the Work and for obtaining (but only as approved by Company) all permits and approvals necessary to perform the Work. Without limiting the foregoing, Contractor agrees to strictly abide by and observe all standards of the Occupational Safety & Health Administration (OSHA) which are applicable to the Work and Company's Contractor/Subcontractor safety policy and any other rules and regulations of the Company. Contractor shall maintain the Work site in a safe and orderly condition at all times. Company shall have the right but not the obligation to review Contractor's compliance with safety and cleanup measures. In the event Contractor fails to keep the work area clean, Company shall have the right to perform such cleanup on behalf of, at the risk of and at the expense of Contractor. Contractor shall require all of its Subcontractors to complete the safety and health questionnaire and checklists provided by Company and shall provide a copy of such documents to Company upon request. Contractor shall conduct, and require its Subcontractors to conduct, safety audits and job briefings during performance of the Work. In the event a Subcontractor has no procedure for conducting safety audits and job briefings, Contractor shall include the Subcontractor in its safety audits and job briefings. All safety audits shall be documented in writing by the Contractor and its Subcontractors. Contractor shall provide documentation of any and all audits identifying safety deficiencies and concerns and corrective action taken as a result of such audits to Company semi-monthly.

7.15. Hazards and Training

Contractor shall furnish trained, qualified, and experienced personnel and appropriate safety and other equipment in first-class condition, suitable for performance of the Work. Such personnel shall be skilled and properly trained to perform the Work and recognize all hazards associated with the Work. Without limiting the foregoing, Contractor shall participate in any safety orientation or other of Company's familiarization initiatives related to safety and shall strictly comply with any monitoring initiatives as determined by Company. Contractor shall accept all equipment, structures, and property of Company as found and acknowledges it has inspected the property, has determined the hazards incident to working thereon or thereabouts, and has adopted suitable precautions and methods for the protection and safety of its employees and the property.

7.16. Drug and Alcohol

No person will perform any of the Work while under the influence of drugs or alcohol. No alcohol may be consumed within four (4) hours of the start of any person's performance of the Work or anytime during the workday. A person will be deemed under the influence of alcohol if a level of .02 percent blood alcohol or greater is found. In addition to the requirements of the drug testing program, as set forth in Company's rules and regulations, all persons who will perform any of the Work will be subject to drug and alcohol testing under either of the following circumstances: (i) where the person's performance either contributed to an accident or cannot be completely discounted as a contributing factor to an accident which involves off-site medical treatment of any person; and (ii) where Company determines in its sole discretion that there is reasonable cause to believe such person is using drugs or alcohol or may otherwise be unfit for duty. Such persons will not be permitted to perform any Work until the test results are established. Contractor shall be solely responsible for administering and conducting drug and alcohol testing, as set forth herein, at Contractor's sole expense. As applicable and in addition to any other requirements under this Agreement, Contractor shall develop and strictly comply with any and all drug testing requirements as required by applicable Laws or Regulations.

7.17. Status of Contractor

Contractor, in performing the Work, shall not act as an agent or employee of Company, but shall be and act as an independent contractor and shall be free to perform the Work by such methods and in such manner as Contractor may choose, doing everything necessary to perform such Work properly and safely and having supervision over and responsibility for the safety and actions of its employees and the suitability of its equipment. Contractor's employees and Subcontractors shall not be deemed to be employees of Company. Contractor agrees that if any portion of Contractor's Work is subcontracted, all such Subcontractors shall be bound by and observe the conditions of this Agreement to the same extent as required of Contractor.

7.18. Equal Employment Opportunity

To the extent applicable, Contractor shall comply with all of the following provisions, which are incorporated herein by reference: (i) Equal Opportunity regulations set forth in 41 CFR § 60-1.4(a) and (c), prohibiting employment discrimination against any employee or applicant because of race, color, religion, sex, or national origin; (ii) Vietnam Era Veterans Readjustment Assistance Act regulations set forth in 41 CFR § 60-250.4 relating to the employment and advancement of disabled veterans and Vietnam era veterans; (iii) Rehabilitation Act regulations set forth in 41 CFR § 60-741.4 relating to the employment and advancement of qualified disabled employees and applicants for employment; (iv) the clause known as "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals" set forth in 15 USC § 637(d)(3); and (v) the subcontracting plan requirement set forth in 15 USC § 637(d).

7.19. Indemnity

Contractor shall indemnify and hold harmless the Company and Engineer and their agents and employees from and against all claims, costs, losses, and damages (including reasonable attorney's fees and court costs) arising from and to the extent of the violation of law, negligence, acts, errors, omissions, or intentional misconduct of Contractor or any firm, entity, or other persons for whose acts or omissions the Contractor is responsible, including any Subcontractors. Company shall indemnify

and hold harmless Contractor and its directors, officers, employees, and agents from and against all claims, costs, losses, and damages (including reasonable attorney's fees and court costs) arising from and to the extent of the violation of law, negligence, acts, errors, omissions, or intentional misconduct of Company.

7.20. Environmental Control:

As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200) and certain other applicable Laws or Regulations, Contractor or its Subcontractors shall provide Material Safety Data Sheets ("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Agreement. Contractor and its Subcontractors shall provide Company with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any applicable Laws or Regulations in effect at the worksite. No asbestos or lead containing materials shall be incorporated into any Work performed by Contractor or otherwise left on the Work site without the prior written approval of Company. Contractor and its Subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Agreement is subject to any applicable Laws or Regulations.

7.20.1. Contractor and its Subcontractors shall label hazardous substances and materials and train their employees in the safe usage and handling of such substances and materials as required under any applicable Laws or Regulations.

7.20.2. Contractor and its Subcontractors shall be solely responsible for the management of any petroleum or hazardous substances and materials brought onto the Work site and shall prevent the release of petroleum or hazardous substances and materials into the environment. All petroleum or hazardous substances and materials shall be handled and stored according to Contractor's written Spill Prevention Control and Countermeasures Plan or Best Management Practices Plan as defined under the provisions of the Clean Water Act, as amended, if either such Plan must be maintained pursuant to applicable Laws or Regulations. Contractor shall provide secondary containment for the storage of petroleum or hazardous substances and materials. The prompt and

proper clean-up of any spills, leaks, or other releases of petroleum or hazardous substances and materials resulting from the performance of the Work under this Agreement and the proper disposal of any residues shall be Contractor's sole responsibility, but Contractor shall give Company immediate notice of any such spills, leaks, or other releases. Contractor shall be solely responsible for the storage, removal, and disposal of any excess or unused quantities of chemicals and materials which Contractor causes to be brought to the Work site.

7.20.3. Unless Company and Contractor expressly agree otherwise in writing, Contractor and its Subcontractors shall be solely responsible for any wastes generated in the course of the Work, and Contractor shall handle, store, and dispose of such wastes in accordance with any Applicable Laws.

7.21. Contractor's Insurance Obligation: Contractor shall provide and maintain, and shall require any Subcontractor to provide and maintain, the following insurance which shall be primary (and, except with regard to Workers' Compensation), naming Company and Engineer as additional insureds and waiving rights of subrogation against Company, Engineer and Company's insurance carrier(s), and shall submit evidence of such coverage to Company prior to the start of the Work. Contractor's liability shall not be limited to its insurance coverage.

7.21.1. Contractor shall furnish certificates of insurance, in the name of the Big Rivers Electric Corporation, evidencing insurance coverage of the following types of minimum amounts:

a. Workman's compensation and employer's liability insurance covering all employees who perform any of the obligations under the Contract or Purchase Order, in the amounts required by law. If any employer or employee is not subject to the workers compensation laws of the governing state, then insurance shall be obtained voluntarily to provide coverage to the same extent as though the employer or employee were subject to such laws.

b. Comprehensive general liability insurance covering all operation under the Contract or Purchase Order: bodily injury - $1,000,000 each occurrence and aggregate; property damage - $1,000,000 each occurrence and aggregate. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable. Coverage should include contractual liability, broad form property damage liability, Owner's and Contractor's protective (independent contractor's) liability, products and completed operations hazard, explosion, collapse, and underground property damage hazard.

c. Automotive liability insurance on all motor vehicles used in conjunction with the Contract or Purchase Order, whether owned, nonowned, or hired; bodily injury - $1,000,000 each person and $1,000,000 each occurrence; property damage $1,000,000 each occurrence. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable.

d. Certificates evidencing the insurance coverage's must be furnished before the commencement of Work. If any work to be performed under this Contract or Purchase Order is sublet, the Contractor will be required to furnish proof of insurance from all Subcontractors evidencing equal to or better coverage.

7.21.2. The above policies to be provided by Contractor shall be written by insurance companies which are both licensed to do business in the state where the Work will be performed and either satisfactory to Company or having a Best Rating of not less than A-. These policies shall not be materially changed or canceled except with thirty (30) days written notice to Company from Contractor and the insurance carrier. Evidence of coverage, notification of cancellation or other

changes shall be mailed to: Attn: Manager, Supply Chain, Big Rivers Electric Corp., P.O. Box 24, Henderson, KY 42419.

7.21.3. Company reserves the right to request and receive a summary of coverage of any of the above policies or endorsements; however, Company shall not be obligated to review any of Contractor's certificates of insurance, insurance policies, or endorsements, or to advise Contractor of any deficiencies in such documents. Any receipt of such documents or their review by Company shall not relieve Contractor from or be deemed a waiver of Company's rights to insist on strict fulfillment of Contractor's obligations under this Agreement.

7.21.4. Contractor shall provide notice of any accidents or claims at the Work site to Company's Manager, Risk Management at Big Rivers Electric Corporation, P.O. Box 24, Henderson, KY 42419 and Company's site safety representative.

7.22. Intellectual Rights and Patents

Contractor shall pay all royalties and license fees which may be payable on account of the Work or any part thereof. In case any part of the Work is held in any suit to constitute infringement and its use is enjoined, Contractor within a reasonable time shall, at the election of Company and in addition to Contractor's obligations under Article 7.19, either (a) secure for Company the perpetual right to continue the use of such part of the Work by procuring for Company a royalty-free license or such other permission as will enable Contractor to secure the suspension of any injunction, or (b) replace at Contractor's own expense such part of the Work with a non-infringing part or modify it so that it becomes non-infringing (in either case with changes in functionality that are acceptable to Company).

7.23. Release of Liens

Contractor hereby releases for itself and its successors in interest, and for all Subcontractors and their successors in interest, any and all claim or right of mechanics or any other type lien upon Company's or any other party's property, the Work, or any part thereof as a result of performing the Work. Contractor shall execute and deliver to Company such documents as may be required by applicable Laws or Regulations to make this release effective and shall give all required notices

to Subcontractors with respect to ensuring the effectiveness of the foregoing release against those parties. Contractor shall secure the removal of any lien that Contractor has agreed to release in this Article within five (5) working days of receipt of written notice from Company to remove such lien. If not timely removed, Company may remove the lien and charge all costs and expenses to Contractor, including without limitation costs of bonding off such lien.

7.24. Assignment of Agreement; Subcontracting

Contractor shall not, by operation of law or otherwise, assign and/or subcontract any part of the Work or this Agreement without Company's written approval. Such approval, if given by Company, shall not relieve Contractor from full responsibility for the fulfillment of any and all obligations under this Agreement. Under any and all circumstances, any permitted assignee of Contractor, whether or not such assignee shall be a division, subsidiary and/or affiliate entity of Contractor, shall also be fully bound by the terms of this Agreement and, furthermore, upon request by Company, each of Contractor and its permitted assignee shall provide sufficient financial information, as determined by Company in its sole discretion, necessary to validate such assignee's credit worthiness and ability to perform under this Agreement.

7.25. Invoices and Effects of Payments

7.25.1. Invoices: In accordance with the Payment and Cancellation Schedule, Contractor shall submit an invoice to Company that complies with this Article. Payments shall be made within thirty (30) days of Company's receipt of Contractor's proper invoice, and, in the event that Company's payment is overdue, Contractor shall promptly provide Company with a notice that such payment is overdue. Contractor's invoices shall designate the Company location which is the responsible party. Such invoices shall reference the Contract / Purchase Order number and shall also show labor, material, taxes paid (including without limitation sales and use taxes, duties, fees, and other assessments imposed by governmental authorities), freight, and all other charges (including without limitation equipment rental) as separate items. All invoices shall be submitted with supporting documentation and in acceptable form and quality to Company's authorized representative. Should Company

dispute any invoice for any reason, payment on such invoice shall be made within thirty (30) days of the dispute resolution. Payment of the invoice shall not release Contractor from any of its obligations hereunder, including but not limited to its warranty and indemnity obligations. Invoices shall not be delivered with goods, unless expressly authorized by the Company, but all correspondence and packages related to this Agreement shall reference the Purchase Order / Contract number assigned by Company.

7.25.2. Surcharges: All charges must be pre-approved and referenced within the Purchase Order or Contract. Unapproved charges will not be accepted and will cause the invoice to be rejected and returned. This includes, but is not limited to, surcharges, packing charges, core charges, deposits, and/or any other added costs.

7.25.3. Sales and Use Taxes

a. Projects: If Company provides Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, then Contractor shall not withhold or pay Kentucky sales or use taxes to the extent such exemption certificate applies to the Work (such exemption does not and shall not apply to any materials consumed by Contractor in performing the Work). If Company does not provide Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, Contractor shall be solely responsible for paying all appropriate sales, use, and other taxes and duties (including without limitation sales or use tax with respect to materials purchased and/or consumed in connection with the Work) to, as well as filing appropriate returns with, the appropriate authorities. To the extent specifically included in the Contract Price, Contractor shall bill Company for and Company shall pay Contractor all such taxes and duties, but Company shall in no event be obligated for taxes and duties not specifically included in the Contract Price or for interest or penalties arising out of Contractor's failure to comply with its obligations under this Section.

b. Goods provided to Big Rivers: The Contractor shall not bill Big Rivers for Kentucky Sales Tax. A Direct Pay Authorization is maintained under Permit # 108814 as per 103 KAR 31:030.

7.25.4. Billing of Additional Work: All claims for payments of additions to the Purchase Order / Contract Price shall be shown on separate Contractor's invoices and must refer to the specific change order or written authorization issued by Company as a condition to being considered for payment.

7.25.5. Effect of Payments/Offset: No payments shall be considered as evidence of the performance of or acceptance of the Work, either in whole or in part, and all payments are subject to deduction for loss, damage, costs, or expenses for which Contractor may be liable under any Purchase Order or set-off hereunder. Company, without waiver or limitation of any rights or remedies of Company, shall be entitled from time to time to deduct from any and all amounts owing by Company to Contractor in connection with this Agreement or any other contract with Company any and all amounts owed by Contractor to Company in connection with this Agreement or any other contract with Company.

7.25.6. Evidence of Payment to Subcontractors: Contractor shall, if requested by Company, furnish Company with a certificate showing names of Contractor's Suppliers and Subcontractors hereunder, and certifying to Company that said Suppliers and Subcontractors have been paid in full.

7.26. Term and Termination

7.26.1. This Agreement shall commence upon the issuance of Purchase Order referencing this Specification, the Bidder's Proposal, and any subsequent negotiations and shall survive in full force and effect until terminated as set forth below. A termination under this Article based on certain Work shall only apply to the Purchase Order that covers such Work. Any purchase orders that do not relate to such Work shall not be affected by such a termination.

7.26.2. Termination for Contractor's Breach:

If the Work to be done under this Agreement shall be abandoned by Contractor, if this Agreement or any portion thereof shall be assigned by operation of law or otherwise without the written permission of the Company, if the Work or any portion thereof is sublet by Contractor without the written permission of Company, if Contractor is placed in bankruptcy, or if a receiver be appointed for its properties, if Contractor shall make an assignment for the benefit of creditors, if at any time the necessary progress of Work is not being maintained, or if Contractor is violating any of the conditions or terms of this Agreement, or has executed this Agreement in bad faith, Company may, without prejudice to any other rights or remedies it may have as a result thereof, notify Contractor to discontinue any or all of the Work and terminate this Agreement in whole or part. Company's foregoing right to notify Contractor and terminate this Agreement is subject to Company first providing Contractor with (i) notice and (ii) 30 days' chance to cure any such defect, failure, breach or improper performance. In the event that Section 365(a) of the Bankruptcy Code or some successor law gives Contractor as debtor-in-possession the right to either accept or reject this Agreement, then Contractor agrees to file an appropriate motion with the Bankruptcy Court to either accept or reject this Agreement within twenty (20) days of the entry of the Order for Relief in the bankruptcy proceeding. Contractor and Company acknowledge and agree that said twenty (20) day period is reasonable under the circumstances. Contractor and Company also agree that if Company has not received notice that Contractor has filed a motion with the Bankruptcy Court to accept or reject this Agreement within said twenty (20) day period, then Company may file a motion with the Bankruptcy Court asking that this Agreement be accepted or rejected, and Contractor shall not oppose such motion.

7.26.3. Effect of Termination for Contractor's Breach:

From the effective date of such termination notice, Contractor shall vacate the site, whereupon Company shall have the right but not the obligation to take possession of the Work wherever located, and Contractor shall cooperate with Company and cause Contractor's Subcontractors to cooperate with Company

so that Company can effect such possession. In obtaining replacement services, Company shall not be required to request multiple bids or obtain the lowest figures for completing the Work and may make such expenditures as shall best accomplish such completion and are reasonable given the circumstances. The expenses of completing the Work in excess of the unpaid portion of the Contract Price, together with any damages suffered by Company, shall be paid by Contractor, and Company shall have the right to set off such amounts from amounts due to Contractor.

7.26.4. Termination for Company's Convenience:

Company may terminate this Agreement or one or more purchase orders in whole or in part for its own convenience by thirty (30) days' written notice at any time. In such event, Company shall pay Contractor all direct labor and Material costs incurred on the Work that is subject to such termination prior to such notice, plus any reasonable unavoidable cancellation costs which Contractor may incur as a result of such termination, plus indirect costs or overhead on the portion of the Work completed, computed in accordance with generally accepted accounting principles less salvage value. As an alternative to salvage value reduction, Company shall have the right in its sole discretion to take possession of all or part of the Work.

7.27. Publicity

Contractor shall not issue news releases, publicize or issue advertising pertaining to the Work or this Agreement without first obtaining the written approval of Company.

7.28. Confidential Information

All information relating to the Work or the business of Company, including, but not limited to, drawings and specifications relating to the Work, and customer information, shall be held in confidence by Contractor and shall not be used by Contractor for any purpose other than for the performance of the Work or as authorized in writing by Company. In the event that the Contractor assigns the work to one or more Subcontractors, a signed confidentiality agreement between the Contractor and each Subcontractor(s) will be provided to the Company prior to the provision of any information described in the immediately preceding sentence or the

performance of any Work by the Subcontractor. All drawings, specifications, or documents furnished by Company to Contractor or developed in connection with the Work shall either be destroyed or returned to Company (including any copies thereof) upon request at any time.

7.29. Miscellaneous

7.29.1. No waiver by Company of any provision herein or of a breach of any provision shall constitute a waiver of any other breach or of any other provision.

7.29.2. Headings: The headings of Articles, Sections, paragraphs, and other parts of this Agreement are for convenience only and do not define, limit, or construe the contents thereof.

7.29.3. Severability: If any provision of this Agreement shall be held invalid under law, such invalidity shall not affect any other provision or provisions hereof which are otherwise valid.

7.29.4. State Law Governing Agreement: This Agreement shall be governed by, and construed in accordance with, the laws of the Commonwealth of Kentucky, without regard to its principles of conflicts of laws.

7.29.5. Enforcement of Rights: Company shall have the right to recover from Contractor all expenses, including but not limited to fees for and expenses of inside or outside counsel hired by Company, arising out of Contractor's breach of this Agreement or any other action by Company to enforce or defend Company's rights hereunder.

7.29.6. No Third Party Beneficiaries: Except for Contractor and Company, there are no intended third party beneficiaries of this Agreement and none may rely on this Agreement in making a claim against Company.

8. NOTICES

All notices and communications respecting this Agreement shall be in writing, shall be identified by the contract number, and shall be addressed as follows (which address either party may change upon five (5) days prior notice to the other party).

To Company:	To Contractor:
Big Rivers Electric Corp.	_____
Attn: Director, Supply Chain	_____
P.O. Box 24	_____
Henderson, Kentucky 42419	_____

8.1. Any notice, request, or approval or other document required or permitted to be given under this Contract will be in writing unless otherwise provided herein and will be deemed to have been sufficiently given if delivered in person, transmitted by fax or email with return receipt and followed by a hard copy, dispatched in the U.S. mails, postage prepaid for mailing by certified or registered mail, return receipt requested, or dispatched for delivery by other courier service providing a return receipt.

9. ENGINEER'S TECHNICAL SPECIFICATION

The Engineer's technical specification from Burns and McDonnell referenced as ***Project 73827, Contract 8220, Foundations*** starts on the next page.

Big Rivers
ELECTRIC CORPORATION

Big Rivers Electric Corporation

Green Station MATS Compliance Project

Contract 8220
Foundations

Contract Documents

Burns & McDonnell Project 73827
May 2014

Burns & McDonnell
SINCE 1898

Big Rivers Electric Corporation
Green Station MATS Compliance Projects – Units 1 and 2
Contract No. 8220 – Foundations
Burns & McDonnell Project No. 73827

TABLE OF CONTENTS

BIG RIVERS ELECTRIC CORPORATION
Green Station MATS Compliance Project – Units No. 1 and 2
Contract No. 8220 – Foundations
Burns & McDonnell Project No. 73827

DOCUMENT 00005 - INDEX AND CERTIFICATION PAGE

TECHNICAL SPECIFICATIONS

CERTIFICATION(S)

STATE OF KENTUCKY
MICHAEL J. ROUSH II
29249
LICENSED PROFESSIONAL ENGINEER

5-5-14
DIV. 33 ONLY

STATE OF KENTUCKY
BRENT D. OXANDALE
27172
LICENSED PROFESSIONAL ENGINEER

5-5-14
Div 26 Only

STATE OF KENTUCKY
STANLEY C. LAWSON
26539
LICENSED PROFESSIONAL ENGINEER

5 MAY 2014
Div 1, 3, 5

STATE OF KENTUCKY
EDWARD T. TOHILL
23271
LICENSED PROFESSIONAL ENGINEER

5/5/14
DIV 31 & 32

BID FORM

www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827

CONTRACT: 8220
Foundations

BIDDER'S NAME: Industrial Contractors Skanska

BID NO:

BIDDER IS TO FILL IN ALL HIGHLIGHTED BLANKS.

1 Schedule:

Submittals: See SECTION 013300

[x] No Exception Taken

[ ] Exception are stated in the attached Clarification and Exceptions Spreadsheet

Construction Milestones: See SECTION 011100

[x] No Exception Taken

[ ] Exception are stated in the attached Clarification and Exceptions Spreadsheet

2 Bidder's manufacturing, fabrication, or warehouse location from which proposed equipment or materials will be shipped:

Evansville IN
(City, State, Country)

Supply shipping weights and dimensions as an attachment to your proposal.

3 List of Subsuppliers and/or Work that will be subcontracted is as follows:

Subsupplier Name	Scope of Work
Harris Davis Rebar	**Reinforcing steel furnish/install**
Patriot Engineering	**testing mtrls**
Associated Engineering	**survey**
IMI	**supply concrete**

4 Quotation Includes Taxes?: Yes x No

5 Addenda. Bidder represents that Bidder has examined the following Addenda, receipt of which is hereby acknowledged. Failure to acknowledge receipt of any duly issued Addendum may be cause for rejection of Quotation.

No.	Date
1	4/11/2014

6

BID COMPLIANCE. If Bidder takes exception to any of the information included in the Bid Documents, such exception shall be clearly stated on the Clarifications and Exceptions spreadsheet provided in the bid documents and incorporated into your Proposal.

If no exceptions are taken, it is agreed that the Bidder understands, accepts and will comply with all requirements specified in the Bid Documents.

A. **Technical Specifications**. Includes data sheets, specifications, drawings and ALL other technical attachments included in Bid Documents.

[ ] No Exception Taken

BID FORM

www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827

CONTRACT: 8220
Foundations

BIDDER'S NAME: Industrial Contractors Skanska

BID NO:

[x] Exception are stated in the attached Clarification and Exceptions Spreadsheet

B. **General Term and Conditions**. Any specific exceptions to the terms and conditions must be so stated in your Proposal by listing the applicable Article number and specific verbiage proposed on the Clarifications and Exceptions spreadsheet provided. Please note that blanket exception of any of the terms and conditions or reference to Bidder's standard terms and conditions are not acceptable and will be grounds for rejection of your Proposal.

[x] No Exception Taken

[ ] Exception are stated in the attached Clarification and Exceptions Spreadsheet

7 PROPOSAL PRICE SUMMARY. All prices are in US$.

Description		Lump Sum Price
Furnish and install retaining wall and retaining wall foundation.		$ 136,100.00
Furnish and install silo/stairtower foundation.		$ 274,988.00
Furnish and install trench.		$ 121,862.00
Furnish and install all remaining foundations, pads, slabs, and pedestals.		$ 140,306.00
Furnish and install electrical grounding.		$ 40,017.00
Furnish and install all remaining Work not included above.		$ 61,992.00
Taxes		$ 20,150.00
Payment and Performance Bonds		$ 4,775.00
Mobilization and demobilization.		$ 5,000.00
TOTAL LUMP SUM PRICE		**$ 805,190.00**

Unit Prices for Payment Adjustments

Description	Unit of Measure	Unit Price
General Grading: Soil Excavation for grading and trenching	CY	$ 18.00
General Grading: Cohesive Fill, including compaction	CY	$ 20.00
Storm Drainage: Reinforced Concrete Trench Installed, incl excavation, backfill and granular bedding	LF	$ 501.00
Erosion Control: Silt Fences, installed	LF	$ 1.75
Erosion Control: 6" Topsoil & Seed, installed	SY	$ 2.00
Road Construction: 10" Crushed Rock, including spread and compacted, and delivery.	SY	$ 28.00
Road Construction: Hot mix asphaltic concrete paving 5" thick	SY	$ 32.00

BID FORM

www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827

CONTRACT: 8220
Foundations

BIDDER'S NAME: Industrial Contractors Skanska

BID NO:

Asphalt Surfacing: 6" Crushed Rock, including spread and compacted, and delivery.	SY	$ 15.00
Demolition: Demo existing asphalt	SY	$ 5.00
Demolition: Demo Concrete trench	CY	$ 100.00
Demolition: Demo two 10" HDPE pipes and haul offsite	LF	$ 7.50
Demolition: Removal of spoils/debris	CY	$ 25.00

Note: Unit price work units will be performed by the Contractor when directed by the Owner. Unit prices are for work not shown on the Contract Drawings, specified in the Contract Documents, or required in the performance of other work specified or indicated.

SUPPLIER PROVIDED ALTERNATES/OPTIONS

The enclosed specifications define requirements associated with materials of construction, components, design methodology, manufacturing and construction methods, etc. Owner encourages suppliers and subcontractors to propose alternate pricing for less costly or better performing alternatives to certain specification requirements when the alternate does not adversely impact the safety, quality, reliability, functionality, or servicing of the item. When proposing alternates, the bidder shall completely define the alternate proposal including the original specification requirement and the estimated cost savings for each alternate.

Description of Alternate	Unit of Measure	Quantity	Unit Price	Extended Price	Alternate Savings

10 Bidder's Checklist: Bidder must indicate as to whether it has provided the following:

		YES	NO
a	Send Proposal as defined in the Commercial terms	x	
b	Clarifications and Exceptions Spreadsheet with Comments	x	
c	Items requested with proposal in Section 013300-A.	x	
d	Quoted Firm Price Validity for ~~60~~30 days beyond the bid due date	x	
e	Agrees to net 60 day payment terms	x	
f	Provide anticipated schedule	x	
g	Includes the cost for warranty requirements	x	
h	Have included the cost for a 100% Payment and Performance Bond or LOC	x	

Please use the Clarifications and Exceptions spreadsheet to submit all such responses and submit a redline markup of the commercial terms and conditions documents and appendices.

BID FORM

www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827

CONTRACT: 8220
Foundations

BIDDER'S NAME: Industrial Contractors Skanska

BID NO:

11 Bidder's Contact for Technical Questions:

Name:	Mike Brooks
Title:	Civil Estimator
Phone No:	(812) 464-7253
Fax No:	(812) 464-9050
Cell No:	812-484-6519
E-Mail:	mike.brooks@skanska.com

12 Bidder's Contact for Commercial Questions:

Name:	Mike Brooks
Title:	Civil Estimator
Phone No:	(812) 464-7253
Fax No:	(812) 464-9050
Cell No:	
E-Mail:	mike.brooks@skanska.com

Proposal Date: 25-Apr-14

Name (Typed) Daniel Hoefling

Authorized Signature:

Title: Sr. V.P./Gen. Mgr.

END OF BID FORM

EXHIBIT 1 - CLARIFICATIONS AND EXCEPTIONS

Project No.:	**73827 – Big Rivers MATS Compliance Project**
Contract:	**8220 - Foundations**
Bidder :	
Current Date:	

All commercial and technical deviations to the Bid Documents shall be brought to Owner's attention in the form of a clarification or exception at the time Bidder's Proposal is submitted. Scope defined in the Bid Documents defines the Work to be provided unless clarifications and exceptions are received and accepted in writing. This form will be used to track and conform all the commercial and technical clarifications and exceptions and document the resolutions, but will not be included in the Contract itself.

Item No.	Page No. / Supplier Item No.	Specification Reference (Section number, page number, paragraph number)	Bidder Clarification / Exception
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section summarizes the Work covered in detail in the complete Contract Documents to give the Contractor a better understanding of the Work required by this Contract. This Section does not place limitation on the amount of Work that may be necessary for the complete procurement and installation specified.

B. Contractor shall be knowledgeable and have experience installing similar types of installations. The information included in the Specifications, Contract Drawings and in the Reference Drawings are not intended to be all inclusive of the information required to perform this Work.

C. Owner: Big Rivers Electric Corporation (BREC) is contracting for the Work described in the Contract Documents.
   1. Contract Identification: Contract 8220 – Foundations
   2. Work Site Location:
      a. BREC – Robert D. Green Generating Station:
         9000 Highway 2096
         Robards, KY 42452

D. Engineer: The Contract Documents were prepared by Burns & McDonnell Engineering Company, Inc., 9400 Ward Parkway, Kansas City, Missouri 64114

1.02 PROJECT DESCRIPTION:

A. Description of Project:
   1. Big Rivers Electric Corporation (BREC) is installing Dry Sorbent Injection (DSI) and Activated Carbon Injection (ACI) systems for Robert D. Green Generating Station (Green) Units 1 and 2. The addition of the DSI and ACI systems are intended to reduce mercury (Hg) emission to levels compliant with the Mercury and Air Toxic Standards (MATS). DSI systems will be used to reduce SO_3 levels as necessary to improve the Hg removal efficiency of activated carbon.
   2. The DSI system will utilize hydrated lime for the reagent, and the ACI system will utilize powdered activated carbon (PAC).

1.03 UNIT OPERATING AND DESIGN PARAMETERS:

A. This Article includes the basic Site/Project information and certain design criteria applicable to the Project. This information is general in nature and may be additionally defined within the technical Specifications. When additionally defined or specified within the technical Specifications, the technical Specification criteria shall control. In the event that additional specific information regarding the Site is required, Contractor shall contact Engineer.

B. Building Code of Record: All Work shall be in accordance with the Kentucky Building Code – 2007 including all appendices, amendments, and reference standard.
   1. Wind Design: Per Kentucky Building Code – 2007 to include the following:
      a. 90 MPH Basic Ground Wind Speed at 33 feet above ground (3-second gust)
      b. Wind Importance Factor $I_W = 1.15$
      c. Exposure C
      d. No wind shielding shall be taken into account
      e. Design to include Topographic K_{zt} and Directionality K_d Factors as applicable per Code.

f. Structures and equipment to be permanently located indoors shall be designed for no less than a 5 psf 'wind' load.

2. Snow Design: Per Kentucky Building Code – 2007 to include the following:
   a. Ground snow load = 15 psf
   b. Snow Importance Factor $I_S = 1.1$
   c. Design to include Exposure C_e and Thermal C_t Factors as applicable per Code.
   d. Design to include drifting increases when applicable due to adjacent structures.
   e. Include rain-on-snow load increase for 'roof' areas sloped less than 1/2 inch per foot.
3. Seismic Design: Per Kentucky Building Code – 2007 to include the following:
   a. Seismic Importance Factor $I_E = 1.25$
   b. Mapped Spectral Accelerations
      (a) Short Period $S_S = 0.851$g, $S_{S,0} = 0.606$g
      (b) 1-second Period $S_1 = 0.240$g, $S_{1,0} = 0.187$g
   c. The soil properties at the Project Site are classified as Site Class D.
   d. Structures and Equipment shall be considered as Occupancy Category III.
4. Ice Loads: Per Kentucky Building Code – 2007 to include the following:
   a. Nominal Ice Thickness t = 0.75 in.
   b. Concurrent Wind Speed $V_c = 30$ mph

C. All Materials for the Project shall comply with the OSHA Regulations and Standards 29CFR1910. If conflicts between Kentucky Building – 2007 and OSHA occur, Kentucky Building Code – 2007 to control. All Work performed on Site shall comply with OSHA Regulations and Standards.

D. All Work and Materials shall be in compliance with local, county, state, federal regulations, codes, standards, laws, and ordinances.

E. Site Conditions:
1. Elevation:
   a. Approximately 412 ft above mean sea level (MSL).
2. Climatology:
   a. Extreme Temperatures:
      (a) Maximum Dry Bulb: 108 °F
      (b) Minimum Dry Bulb: -23 °F
   b. Design Conditions: (ASHRAE)
      (a) Summer (1% coincident): 90.9 °Fdb/76.2 °Fwb
      (b) Winter (99%): 15 °F
      (c) Design Relative Humidity 89%
   c. Plant Site Frost Depth: Per Kentucky Building Code – 2007, a minimum depth of 24 in. or erecting on solid rock. Actual minimum depth to be determined by the Geotechnical investigation.
   d. Precipitation:
      (a) Average Annual Rainfall: 45.5 inches
      (b) Design Storm (24 hour): (US Department of Commerce/US Weather Bureau - Technical Paper 40).

Duration	10-year Return Period	25-year Return Period	100-year Return Period
24 hour	4.3 inches	5.2 inches	6.1 inches

1.04 WORK COVERED BY CONTRACT DOCUMENTS:

A. Furnish all construction labor, supervision, equipment, tools, rigging, blocking, scaffolding, material, supplies, transportation, project management, construction management (including scheduling and cost control), and services necessary to:

1. Furnish all labor, equipment, and materials to install the foundations and retaining walls as indicated on the Contract Drawings including but not limited to, formwork, reinforcing steel, concrete, concrete placement, curing, and finishing.
2. Survey, layout, and staking of all foundations, anchor bolts and underground utilities.
3. Furnish and install all anchor bolts including sleeves, nuts and washers. A template locating the anchor bolts for the silos will be provided by others. Date of delivery for the template to be determined later.
4. Excavate as required to form and construct all foundations, including but not limited to, mat foundations, grade slabs, equipment pads, soil supported spread footings, retaining walls, and trenches. Removal and disposal of hazardous materials and chemical treatment or removal of hazardous unsuitable subgrade is by others.
5. Contractor shall be responsible for back-sloping, shoring and/or sheet piling the excavated areas to protect its personnel and prevent damage to existing facilities.
6. Contractor shall identify soil type and classification to determine applicable bench and slope requirements prior to performing excavation. All excavations shall be performed in accordance with the latest OSHA standards and safely supported/sloped as required to prevent collapse of earth walls.
7. Owner will hire an independent testing laboratory to perform ~~the tests per the plans and specifications including but not limited to: soil density testing and related soil property testing, rock gradation and compaction testing,~~ compression test cylinders~~, slump tests and air content tests~~. Contractor shall coordinate all activities with the Independent Testing Laboratory in the performance of the above mentioned tests. Contractor will be given copies of test reports.
8. Remove and dispose of existing asphalt pavement in the area of the pipe rack foundations and as required to remove asphalt not previously removed by the pre-piling contractor in the vicinity of the silo mat, trenching, and equipment pad. Asphalt pavement will be reinstalled by others.
9. Remove the two existing 10" diameter HDPE drainage pipes as indicated on the drawings.
10. Furnish and install the new reinforced concrete trench and tie-in to the existing trench to match the invert elevations.
11. Slope the new trench invert linearly from the high side of the existing trench to the lower end.
12. Furnish and install grating for new concrete trench.
13. Backfill and compact material as specified.
14. ~~Remove all spoils onsite.~~ Concrete, asphalt, and subgrade spoils can be disposed on site at an Owner approved location. Contractor shall provide a dumpster and shall be responsible for removal of all trash.

15. Contractor shall be responsible for all site drainage during all phases of the work, and that all excavations shall be protected from surface water drainage by use of berms, dikes, sediment barriers and/or proper grading of surrounding area. Contractor shall provide all dewatering of excavations with the assumption that only incidental, minor groundwater may be present and that Others will not discharge solutions into excavations.
16. Furnish and install grounding systems consisting of ground rods, conductors, connectors and welds.
17. Perform earthwork, compaction of subgrade, backfilling, and grading.
18. Procure and install drainage piping system including riprap at termination point of drainage piping.
19. Flush, test and commission the new pipe installed under this Contract.
20. Contractor shall create a temporary concrete truck wash-out area within the confines of the Site, as approved by Owner. At completion of Contractor's work, Contractor shall demolish and remove contents of the temporary concrete truck wash-out area to a legal off-site disposal location and return the area to its original condition, including any additional backfill and grading.
21. Contractor shall restore areas disturbed by Contractor's construction work to the elevations and finishes indicated on the Contract Documents or original pre-construction conditions, if not otherwise indicated on the Contract Documents.
22. Provide project management, construction management, and supervision, including scheduling and cost control.
23. Obtain all local building and construction permits and pay all contractor fees and inspection fees required by local authorities.
24. Piling will be installed by Others in two phases. Phase 1 will be installed prior to mobilization of the Contractor. Contractor shall take all precautions to not damage in-place piling. Phase 2 piling will be installed later such that the Contractor shall have an access corridor to install the retaining wall and associated backfill. Contractor shall be required to coordinate and schedule work activities to comply with the schedule indicated in the Work Sequence, Scheduled Events within this Section. See Work Sequence, Scheduled Events for piling installation schedule. The Contractor shall coordinate their work such that the piling contractor shall have unimpeded access to perform the Phase 2 piling work.
25. Contractor shall perform any subgrade improvements as required as a result of the piling being installed.
26. Furnish and install new below grade (buried), below, and at grade (embedded) grounding grid components including ground grid cables, ground rods, exothermic welds, and ground cable risers coiled above grade at each riser connection point for future connection by others.
27. Report to the Owner, repair or replace any existing grounding system components that are damaged or destroyed during excavation.
28. Location and removal of underground utilities is by others. Precautions shall be taken during the excavation of the pile caps and faoundations to not damage know or unknown below grade obstructions. Any below grade items encountered during excavation shall be brought to the Owner's attention for resolution. Contractor's damage of known below grade obstructions shall be repaired/replaced by the Contractor.
29. Provide furnish and install shelf angles along both sides of the trench walls to support the grating. The shelf angles shall consist of a L2x2x1/4 with ½ inch diameter by 4 inch headed studs at 18 inch with a ¼ inch bar along the vertical edge of the shelf.

30. Provide furnish and install two additional 4 inch diameter drains which shall tie-in to a common drain header. The drain header will run under the equipment area foundation and will penetrate the retaining wall on the east side. The estimated length of the 4 inch diameter HDPE pipe is 25 feet.

1.05 WORK BY OTHERS:

A. Work Under Other Contracts:
   1. Contract 1340 – Mercury Control System. This contract will furnish all major equipment associated with the Dry Sorbet Injection System, the Activated Carbon Injection System, and auxiliary equipment associated with these systems.
   2. Contract 8210 – Piling. This contract will install piling underneath the silo foundation pad.
   3. Contract 8320 –General Construction. This contract will erect all equipment, above grade piping, structural steel, siding, roofing, and the power control module. This contract will also furnish and install cable and raceway for all equipment, instrumentation, and controls and connect all equipment to ground grid.

B. Work by Owner:
   1. Owner will contract with Others for site and subsurface preparation prior to mobilization of this Contract. This work by Others will include saw cutting and removing existing asphalt in the construction area, excavation of subgrade to driving surface (bottom of concrete mat), installing a temporary trenching system, and an optional ramp if needed for access into the excavation.

1.06 CONTRACTOR'S USE OF PREMISES:

A. Limited Use:
   1. Limit use of the premises for storage and execution of the Work to allow for Owner occupancy. Confine operations to areas within Contract limits indicated. Portions of Site outside the Contract limits shall not be disturbed.
   2. Coordinate with other separate contractors and Owner to avoid interference of operations.
   3. Conduct operations so as to ensure the least inconvenience to Owner.

1.07 OWNER'S USE OF PREMISES:

A. Full Owner Occupancy: The Owner will occupy the Site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.

1.08 SUBSURFACE INFORMATION:

A. Certain subsurface information has been otainined at, or in the vicinity of, the Site of the Work.
B. Copies of such subsurface information will be issued only to prospective Bidders who request such subsurface information and sign a receipt therefor.
C. There is no express or implied guarantee as to the accuracy or completeness of the subsurface information, nor of the interpretation thereof by the Owner, Engineer, or any of their representatives.
D. The subsurface information or copies thereof do not form a part of this or any contract document issued by the Owner or Engineer.

1.09 WORK SEQUENCE:

A. General: Construction sequence shall be determined by Contractor subject to Owner's need for continuous operation of existing facilities.

B. Continuous Service of Existing Facilities: Exercise caution and schedule operations to ensure that functioning of present facilities will not be disrupted. Shutdown of Owner's operating facilities to perform the Work shall be held to a minimum length of time and shall be coordinated with Engineer and Owner who shall have control over the timing and schedules of such shutdowns.

C. Scheduled Events: Schedule the Work to conform to the following events and dates.

1.	Notice to proceed: Foundations	05 May 2014
2.	Phase 1 piling start (by Others):	28 April 2014
3.	Phase 1 piling complete (by Others):	19 May 2014
4.	Contractor mobilization complete:	03 June 2014
5.	Retaining walls and backfill complete:	18 July 2014
6.	Phase 2 piling start (by Others):	21 July 2014
7.	Phase 2 piling complete (by Others):	25 July 2014
8.	Expected General Construction Contractor Mobilization:	05 Aug 2014
9.	Substantial Completion:	05 Sept 2014
10.	Final Completion:	19 Sept 2014

1.10 MEASUREMENT AND PAYMENT:

A. Lump Sum Contracts: All Work indicated and specified in the Contract Documents shall be included in the Lump Sum Contract Price.

B. Change Orders and Payment Procedures: Stated in Commercial Documents.

1.11 COPIES OF DOCUMENTS:

A. Furnished Copies: After execution of Agreement, Contractor will be furnished at no cost, two original sets of Contract Documents consisting of full-size Contract Drawings, including revised Drawings, in addition to those used in execution of the Agreement. Contractor will also be furnished one electronic PDF file of the Contract Documents.

1.12 LIST OF DRAWINGS:

A. Contract Drawings:
   1. List of Contract Drawings indicated on the Contract Drawing Index Sheet.

B. Reference Drawings:
   1. List of Reference Drawings indicated on the Contract Drawing Index Sheet.

1.13 PROJECT RECORD DOCUMENTS:

A. General: In addition to documentation required by the Contract Documents, maintain at the Contractor's facilities (and at installation Site) one record copy of:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to the Contract.
   5. Approved Shop Drawings, product data, and Samples.

B. Recording:
   1. Label each document "PROJECT RECORD" in neat, large, printed letters.

2. Record information concurrently with fabrication or Field Services progress.
3. Record Drawings: Legibly mark to record actual construction:
   a. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
   b. Field changes of dimension and detail.
   c. Changes made by Change Order or other Modifications. Note related Change Order numbers where applicable.
   d. Details not on original Contract Drawings.
4. Record Specifications and Addenda: Legibly mark each Section to record:
   a. Manufacturer, trade name, catalog number, and Supplier of each product and item of Equipment actually furnished, particularly optional and substitute items.
   b. Changes made by Addendum, Change Order, or other modifications.
   c. Related Submittals.
5. Record Product Data: Maintain one copy of each product data Submittal, and mark-up significant variations in actual Work in comparison with submitted information.
   a. Include both variations in product as delivered to Point of Delivery, and variations from manufacturer's instructions and recommendations for installation.
6. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily observed. Note related Change Orders and mark-up of record drawings and specifications.
7. Upon completion of the Work, submit record drawings to Engineer for Owner's records.
   a. Include the following:
      (1) Depths of various elements of foundation in relation to finish first floor datum.
      (2) Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
      (3) Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.
      (4) Where Submittals are used for mark up, record a cross reference at corresponding location on Drawings.
      (5) Field changes of dimension and detail.
      (6) Changes made by Change Order or other Modifications.
      (7) Details not on original Contract Drawings.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION – Not Applicable.

END OF SECTION 011100

SECTION 012500 - SUBSTITUTIONS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

B. Related Work Specified Elsewhere:

1. Requirements for submitting Contractor's construction progress schedule and the Submittal schedule: SECTIONS 013200 and 013300.
2. Requirements governing Contractor's selection of products: SECTION 016000.

1.02 DEFINITIONS:

A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Changes in products, Materials, Equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Revisions to the Contract Documents requested by Owner or Engineer.
2. Specified options of products and construction methods included in the Contract Documents.
3. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

1.03 SUBMITTALS:

A. Substitution Request Submittal: Engineer will consider written requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of Engineer.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for Change Order proposals. Requests for substitution shall not be submitted in the form of a Request for Information (RFI).
2. Identify the Equipment or Material, the fabrication, or installation method to be replaced in each request. Include related Specification Section/Article and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
    a. Statement indicating why specified product or method of construction cannot be provided.
    b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate the proposed substitution.
    c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    d. Product data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.

f. Identification of available sales, maintenance, repair, and replacement services.
g. A statement indicating the effect of the substitution on Contractor's construction progress schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on the overall Contract Times. If specified product cannot be provided within the Contract Times, provide letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delay in delivery.
h. An itemized estimate of costs that will result directly or indirectly from approval of the substitution, including:
   (1) A proposal of the net change, if any, in the Contract Price.
   (2) Costs of redesign required by the proposed change.
   (3) Costs of resulting claims as determined in coordination with other contractors having work on the Project affected by the substitution.
i. Statement indicating whether or not incorporation or use of the substitute is subject to payment of any license fee or royalty.
j. Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents, will perform adequately the functions and achieve the results called for by the general design, is similar in substance to that specified, and is suitable for same use as that indicated and specified.
k. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

4. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of the substitution within a reasonable time of receipt of the request, or of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a Change Order.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS:

A. Conditions: Engineer will receive and consider Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by Engineer. If the following conditions are not satisfied, Engineer will return the requests without action except to record noncompliance with these requirements.
   1. Extensive revisions to the Contract Documents are not required.
   2. Proposed substitution is in keeping with the general intent of the Contract Documents and will produce indicated results.
   3. Substitution request is timely, fully documented, and properly submitted.
   4. The specified product or method of construction cannot be provided within the Contract Times. Engineer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
   5. The requested substitution offers Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where Contractor certifies that the substitution will overcome the incompatibility.
8. The specified product or method of construction cannot be coordinated with other materials and where Contractor certifies that the proposed substitution can be coordinated.
9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where Contractor certifies that the proposed substitution provides the required warranty.
10. Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.

B. Engineer's review and acceptance of Submittals shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents. Engineer's acceptance of Submittals not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval of a substitute. Acceptance by Engineer shall not relieve Contractor from responsibility for errors or omissions in the Submittals.

PART 3 - EXECUTION: Not Applicable

END OF SECTION 012500

SECTION 013100 - PROJECT COORDINATION AND MEETINGS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Coordination drawings.
   2. Project meetings.
   3. Requests for information (RFIs).

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Work Specified Elsewhere:
   1. For preparing and submitting Contractor's construction progress schedule: SECTION 013200.
   2. For Submittal Requirements: SECTION 013300.

1.02 DEFINITIONS:

A. RFI: Request for information prepared by Contractor and submitted to Engineer seeking interpretation or clarification of the Contract Documents.

1.03 COORDINATION:

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors, Owner, and other entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   2. Coordinate installation with other contractors to allow optimum accessibility.
   3. Where availability of space is limited, coordinate installation of different components to allow optimum performance and accessibility.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of others to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of construction progress schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.

4. Delivery and processing of Submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

1.04 SUBMITTALS:

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities. Coordination Drawings need to show how designated laydown spaces will be utilized during construction.

1.05 PROJECT MEETINGS:

A. Preconstruction Conference:
   1. Engineer will conduct a meeting within 20 days after the Effective Date of the Agreement, to review items stated in the following agenda and to establish a working understanding between the parties as to their relationships during performance of the Work.
   2. Preconstruction conference shall be attended by:
      a. Representative(s) of Contractor including Contractor's superintendent.
      b. Engineer.
      c. Representative(s) of Owner.
      d. At Engineer or Owner's option, representatives of principal Subcontractors and Suppliers.
   3. Meeting Agenda:
      a. Construction schedules.
      b. Phasing.
      c. Critical Work sequencing and long-lead items.
      d. Designation of key personnel and their duties; lines of communication.
      e. Project coordination.
      f. Procedures and Processing of:
         (1) RFIs.
         (2) Field decisions.
         (3) Substitutions.
         (4) Submittals.
         (5) Change Orders.
         (6) Applications for Payment.
      g. Procedures for testing.
      h. Procedures for preparing and maintaining record documents.
      i. Use of Premises:
         (1) Office, work, storage, laydown, and parking areas.
         (2) Owner's requirements.
         (3) Work restrictions and hours.
      j. Construction facilities, controls, and construction aids.
      k. Temporary utilities.
      l. Safety and first-aid.
      m. Security.
      n. Deliveries of Equipment and Materials.
   4. Location of Meeting: At the Project Site or teleconference.

5. Reporting:
    a. Within three working days after the meeting, Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.
    b. Contractor shall provide copies to Subcontractors and major Suppliers.

B. Coordination Schedules:
1. Engineer will conduct a meeting at least ten days before submission of the first Application for Payment to finalize the initial coordination schedules requested under SECTION 013200 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS.
2. The meeting shall be attended by:
    a. Representative(s) of Contractor including Contractor's superintendent (and scheduler).
    b. At Engineer or Owner's option, representatives of principal Subcontractors and Suppliers.
    c. Engineer.
    d. Representative(s) of Owner.

C. Construction Progress Meetings:
1. Engineer will schedule and conduct a meeting at least weekly and at other times requested by Engineer. Representatives of the Owner, Engineer, and Contractor shall be present at each meeting. With Engineer's concurrence, Contractor may request attendance by representatives of Subcontractors, Suppliers, or other entities concerned with current program or involved with planning, coordination, or performance of future activities. All participants in the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. Contractor and each Subcontractor represented shall be prepared to discuss the current construction progress report and any anticipated future changes to the schedule. Each Subcontractor shall comment on the schedules of Contractor and other Subcontractors and advise if their current progress or anticipated activities are compatible with that Subcontractor's Work.
3. If one Subcontractor is delaying another, Contractor shall issue such directions as are necessary to resolve the situation and promote construction progress.
4. Meeting Agenda:
    a. Review of construction progress since previous meeting.
    b. Field observations, interface requirements, conflicts.
    c. Issues which may impede construction schedule.
    d. Off-Site fabrication.
    e. Delivery schedules.
    f. Submittal schedules and status.
    g. Site use; coordination with other contractors.
    h. Temporary facilities, controls, and services.
    i. Hours of Work.
    j. Hazards and risks.
    k. Housekeeping.
    l. Quality and Work standards.
    m. RFIs.
    n. Status of Change Orders.
    o. Documentation of information for payment requests.
    p. Corrective measures and procedures to regain construction schedule if necessary.
    q. Revisions to construction schedule.
    r. Review of proposed activities for succeeding Work period.

s. Review proposed Contract modifications for:
(1) Effect on construction schedule and on completion date.
(2) Effect on other contracts of the Project.
t. Other business.

5. Location of Meetings: Teleconference.
6. Reporting:
a. Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.
b. Contractor shall distribute copies to principal Subcontractors and Suppliers.

D. Preinstallation Conferences:
1. Contractor shall conduct a preinstallation conference at the Project Site before each construction activity that requires coordination with other construction and where required in DIVISIONS 3 through 33.
2. Installer and representatives of manufacturers and fabricators, of products furnished by this Contract or by others, involved in or affected by the installation Work and its coordination or integration with other materials and installations, shall attend the meeting. Advise Engineer of scheduled meeting dates.
3. Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including installation procedures and requirements for the following:
a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Shop Drawings, product data, and quality control Samples.
g. Possible conflicts.
h. Compatibility problems.
i. Time schedules.
j. Weather limitations.
k. Manufacturer's recommendations.
l. Warranty requirements.
m. Acceptability of substrates.
n. Temporary facilities and controls.
o. Space and access limitations.
p. Governing regulations.
q. Safety.
r. Inspecting and testing requirements.
s. Required performance results.
t. Recording requirements.
u. Protection of construction, personnel, and adjacent work.
4. Record significant discussions and agreements and disagreements of each conference. Distribute the minutes of the meeting within 3 working days after the meeting to everyone concerned, including Owner and Engineer.
5. Do not proceed with the installation if disagreements arise during the conference which cannot be successfully resolved at the time. Contractor shall take actions necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

E. Multiple Contract Coordination Meetings:

1. Engineer may conduct coordination meetings to be attended by Owner's representative(s) and prime contractors at the Site. Contractor shall participate in such conferences, accompanied by Subcontractors as requested by Engineer.
2. Agenda will be similar to that stated above for construction progress meetings.
3. Location of Meetings: At the Project Site.
4. Reporting:
   a. Engineer will prepare and distribute minutes of the meeting to Owner and contractors.
   b. Contractors shall distribute copies to affected Subcontractors and Suppliers.

1.06 REQUESTS FOR INFORMATION (RFIs):

A. Procedure: Promptly on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI with the content specified.
   1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's Work or work of Subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
   1. Project name.
   2. Date.
   3. Name of Contractor.
   4. Contract number and title.
   5. Name of Engineer.
   6. RFI number, numbered sequentially.
   7. Specification Section number and title and related paragraphs, as appropriate.
   8. Drawing number and detail references, as appropriate.
   9. Field dimensions and conditions, as appropriate.
   10. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Times or the Contract Price, Contractor shall state impact in the RFI.
   11. Contractor's signature.
   12. Attachments: Include drawings, descriptions, measurements, photos, product data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

C. Hard-Copy RFIs:
   1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Engineer's Action: Engineer will review each RFI, determine action required, and return it. Allow seven days for Engineer's response for each RFI. RFIs received after 1:00 p.m. local time will be considered as received the following working day.
   1. The following RFIs will be returned without action:
      a. Requests for approval of Submittals.
      b. Requests for approval of substitutions.
      c. Requests for coordination information already indicated in the Contract Documents.
      d. Requests for adjustments in the Contract Times or the Contract Price.
      e. Requests for interpretation of Engineer's actions on Submittals.
      f. Incomplete RFIs or RFIs with numerous errors.

2. Multiple RFIs addressing similar or identical issues may be addressed by Engineer with a single broad response.
3. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again upon Contractor's response and resubmittal.
4. If Contractor believes the RFI response warrants change in the Contract Times or the Contract Price, notify Engineer in writing within five days of receipt of the RFI response.

F. On receipt of Engineer's action, update the RFI log and promptly distribute the RFI response to affected parties. Review response and notify Engineer within five days if Contractor disagrees with response.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Preliminary construction progress schedule.
   2. Construction progress schedule.
   3. Schedule of Submittals.
   4. Schedule of values.
   5. Construction progress reports.
   6. Daily construction reports.
   7. Equipment and Material location reports.
   8. Field condition reports.
   9. Special reports.

B. Related Work Specified Elsewhere:
   1. For submitting and distributing meeting and conference minutes: SECTION 013100 - PROJECT COORDINATION AND MEETINGS.
   2. For submitting schedules and reports: SECTION 013300 - SUBMITTALS.

1.02 REFERENCES:

A. Associated General Contractor's of America (AGC):
   1. Construction Planning and Scheduling.

1.03 DEFINITIONS:

A. Activity: A discrete part of a contract that can be identified for planning, scheduling, monitoring, and controlling the construction Work. Activities included in a construction schedule consume time and resources, but shall not include planned work stoppages. Activities shall not normally reflect the Work of more than one trade.
   1. Critical activities are activities on the critical path and have zero or negative float. Critical activities must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. "Baseline" schedule: The schedule submitted and accepted by Engineer for the Work.

C. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Price, unless otherwise approved by Engineer.

D. CPM: Critical path method (CPM), which is a method of planning and scheduling a construction contract where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Contract.

E. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Contract duration and contains no float.

F. Event: The starting or ending point of an activity. An event has no duration.

G. Float: The measure of leeway in starting and completing an activity.
   1. Float time belongs to Owner.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting an intermediate deadline or the planned Contract completion date.

H. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

I. Milestone: A key or critical point in time for reference or measurement. A milestone has no duration.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.04 SUBMITTALS:

A. Qualification Data: For scheduling consultant.

B. Schedule of Submittals: Submit in specified electronic format. Arrange the following information in a tabular format:
   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (technical or informational).
   4. Name of Subcontractor or Supplier.
   5. Description of the Work covered.
   6. Scheduled date for Engineer's final release or approval.

C. Preliminary Construction Progress Schedule: Submit in specified electronic format.
   1. Acceptance of cost-loaded preliminary construction schedule will not constitute acceptance of schedule of values for cost-loaded activities.

D. Preliminary Network Diagram: Submit in specified electronic format, large enough to show entire network for entire construction period. Show logic ties for activities.

E. Construction Progress Schedule: Submit initial schedule, large enough to show entire schedule for entire construction period to Engineer for review and acceptance.
   1. Submit electronically, using software indicated, labeled to comply with requirements for Submittals. Include type of schedule (Initial or Updated) and date.

F. CPM Reports: Concurrent with CPM schedule, submit electronically each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
   1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
   2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
   3. Total Float Report: List of all activities sorted in ascending order of total float.
   4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment. Review of planned, earned, and spent earned value analysis.

G. Schedule of Values: Submit with initial construction progress schedule to Engineer for review and approval in specified electronic format.

H. Construction Progress Reports: Submit electronically at weekly intervals.

I. Daily Construction Reports: Submit electronically at weekly intervals.

J. Material Location Reports: Submit electronically at weekly intervals.

K. Field Condition Reports: Submit electronically at time of discovery of differing conditions.

L. Special Reports: Submit electronically at time of unusual event.

1.05 QUALITY ASSURANCE:

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Engineer's request.

B. Prescheduling Conference: Conduct conference at Project Site to comply with requirements in SECTION 013100 - PROJECT COORDINATION AND MEETINGS. Review methods and procedures related to the preliminary construction schedule and "baseline" construction progress schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of Submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review Submittal requirements and procedures.
11. Review procedures for updating schedule.

1.06 COORDINATION:

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate construction progress schedule with the schedule of values, list of subcontracts, schedule of Submittals, Material and Equipment procurement, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.01 SCHEDULE OF SUBMITTALS:

A. Preparation: Submit a schedule of Submittals, arranged in chronological order by dates required by construction progress schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates as required in SECTION 013300 - SUBMITTALS.

1. Coordinate Submittals schedule with list of subcontracts, the schedule of values, and "Baseline" construction progress schedule.
2. Initial Submittal: Submit concurrently with preliminary schedule. Include Submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

2.02 CONTRACTOR'S CONSTRUCTION PROGRESS SCHEDULE, GENERAL:

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established in the Notice to Proceed to date of Final Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each building floor or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 30 calendar days, unless specifically allowed by Engineer.
   2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, Submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in SECTION 013300 - SUBMITTALS in schedule. Coordinate Submittal review times in Contractor's construction progress schedule with schedule of Submittals.
   4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work under More Than One Contract: Include a separate activity for each contract.
   3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
   4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in SECTION 011100 - SUMMARY OF WORK. Delivery dates indicated stipulate the earliest possible delivery date.
   5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in SECTION 011100 - SUMMARY OF WORK. Delivery dates indicated stipulate the earliest possible delivery date.
   6. Work Restrictions: Show the effect of the following items on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.
   7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
      a. Subcontract awards.
      b. Submittals.
      c. Purchases.
      d. Mockups.
      e. Fabrication.

f. Sample testing.
g. Deliveries.
h. Installation.
i. Tests and inspections.
j. Adjusting.
k. Curing.
l. Performance, guarantee, and acceptance testing.

E. Placement into final use and operation. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
1. Assign cost to construction activities on the CPM schedule. Costs shall not be assigned to Submittal activities unless specified otherwise but may, with Engineer's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable).
2. Each activity cost shall reflect an accurate value subject to acceptance by Engineer.
3. Total cost assigned to activities shall equal the total Contract Price.

G. Contract Modifications: For each proposed Contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall schedule.

H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules and is acceptable to Engineer:
1. Primavera Project Planner (P3).
2. Primavera 3e.
3. Primavera 5.0.
4. SureTrak.
5. Engineer-approved equal.

2.03 PRELIMINARY CONSTRUCTION PROGRESS SCHEDULE:

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within 7 days after the Notice to Proceed.
1. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work.

B. Preliminary Schedule of Values:
1. Initiate a preliminary value assigned to each significant construction activity.
2. Values shall give an indication of cash requirement prediction, with total equal to Contract Price.
3. Submit within ten days of Effective Date of Contract to Engineer and Owner for review.

2.04 CONSTRUCTION PROGRESS SCHEDULE (GANTT CHART):

A. Gantt-Chart Schedule: After submittal of preliminary construction progress schedule as stated above, submit a detailed construction progress schedule within 14 days after the Notice to

Proceed. Base the schedule on the preliminary construction progress schedule and incorporate review comments and other feedback.

B. The schedule shall show the Work in a horizontal bar chart or other graphic format suitable for displaying scheduled and actual progress.
   1. The schedule shall indicate phases of the Work, starting date, interim milestones, and dates of Substantial Completion and Final Completion.
   2. Breakdown Work phases into separate time bar for each significant construction activity entry, with dates Work is expected to begin and be completed. Within each time bar, indicate estimated completion percentage in 10% increments.
   3. Scale and spacing shall allow room for notation and revisions.
   4. Sheet Size: Minimum 11 x 17 inches.

C. Provide subschedules to define in more detail critical portions of schedules, including inspections and tests.

D. Coordinate construction progress schedule with schedule of values, schedule of Submittals schedule, procurement schedule, progress reports, and payment requests.

E. Engineer will review and comment on construction progress schedule and, upon agreement between Engineer and Contractor on necessary changes:
   1. Contractor shall distribute copies as specified of the accepted "baseline" schedule to Engineer. Contractor shall provide additional copies to Subcontractors and other parties required to comply with scheduled dates, one copy to each party.

F. Revise the construction progress schedule after each meeting, event, or activity where revisions have been recognized and accepted to reflect impacts of new developments on the schedule.

G. Update and submit electronically to Engineer the revised schedule at least once each month to show actual progress compared to the originally accepted "baseline" schedule and any proposed changes in the schedule of remaining Work. Include with construction progress report.

2.05 CONSTRUCTION PROGRESS SCHEDULE (CPM SCHEDULE):

A. General: Prepare network diagrams using:
   1. AON (activity-on-node) format.
   2. Precedence Diagramming Method (PDM).

B. Preliminary Network Diagram: Submit diagram within seven days of Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare detailed construction progress schedule using a computerized time-scaled CPM network analysis diagram for the Work.
   1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use as the "baseline" schedule no later than 30 days after Notice to Proceed.
      a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all Work within the Contract Times, regardless of Owner's and Engineer's acceptance of the "baseline" schedule.
      b. Prior to acceptance of the "baseline" schedule, progress payment requests will be approved based on Work-in-place estimates by Owner and Engineer.
      c. No progress payment will be made after the third month of the Contract Times unless the "baseline" CPM schedule is submitted as specified.
      d. No progress payment will be made after the third month of the Contract Times unless the "baseline" CPM schedule is accepted by Engineer and Owner.

2. Conduct educational workshops to train and inform key Project personnel, including Subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one 8-hour workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Assign each activity a number.
   a. Assign numbering such that predecessor activity numbers are smaller numerically than successor activity numbers.
   b. Use even-numbered activities for base Contract Work, and odd-numbered activities for Change Order work.
2. Include estimated time frames for the following activities:
   a. Preparation and processing of Submittals.
   b. Mobilization and demobilization.
   c. Purchase of Equipment and Materials.
   d. Delivery.
   e. Fabrication.
   f. Utility interruptions.
   g. Installation.
   h. Work by Owner that may affect or be affected by Contractor's activities.
   i. Startup and initial operations.
   j. Performance and guarantee testing.
3. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
4. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Times.
5. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
   a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
6. Float: Contractor shall not use artificial activity durations, preferential logic, or other devices for sequestering float. Owner retains the right to reject any schedule submittal in which Contractor has sequestered float.

E. Initial "Baseline" Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports in hardcopy and electronic formats showing the following:
1. Contractor or Subcontractor and the Work or activity.
   a. Assign responsibility codes to all parties responsible for an activity.
2. Description of activity.
   a. To fully describe Work to be performed.
   b. To indicate hammocks and milestones.
3. Principal events of activity.

4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

F. Schedule Updating:
1. Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
a. Identification of activities that have changed.
b. Changes in early and late start dates.
c. Changes in early and late finish dates.
d. Changes in activity durations in workdays.
e. Changes in the critical path.
f. Changes in total float or slack time.
g. Changes in the Contract Times.
2. A final "as-constructed" schedule with actual sequence and start and finish dates for activities shall be provided to Engineer, with other specified record documents as a condition precedent to final payment.

G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
b. Submit value summary printouts one week before each regularly scheduled construction progress meeting.

H. Three-Week Look-Ahead Schedule: Prepare and issue on a weekly basis to indicate all planned Work for performance during the current week and the subsequent two-week interval.
1. Bar-chart format listing activities that are in progress from previous week or will begin within three weeks of the current status date.
2. Manpower loaded, sufficient to direct craft efforts day-to-day.
3. Include activities that are required to be completed by others which may impact the start or completion of planned activities.
4. Coordinate with complete CPM schedule with regard to phases and milestones.

2.06 SCHEDULE OF VALUES:

A. Based on the preliminary draft schedule of values, reviewed by Engineer and Owner, submit finalized schedule of values acceptable to Engineer as to form and basic details. Submit final within 30 days after Notice to Proceed.

B. Coordinate preparation of schedule of values with preparation and content of construction progress schedule.

C. Content:

1. Schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction.
2. Follow the construction progress schedule breakdown of Work activities as format for listing component items and assigning values.
3. Follow the table of contents of this Project Manual as the format for listing component items.
   a. Identify each line item, with the number and title of the respective major Division or Section of the Specifications.
4. For each major line item, list subvalues of major products or operations under the item.
   a. Each item shall include a directly proportional amount of the Contractor's overhead and profit.
   b. For items on which progress payments will be requested for stored materials received, but not installed, break down the value into:
      (1) The cost of the materials, delivered and unloaded, including taxes paid unless taxes are exempted.
      (2) The total installed value.
   c. The sum of all values listed in the schedule shall equal the total Contract Price.

2.07 REPORTS:

A. Construction Progress Reports:
   1. Submit a report on actual construction progress on a weekly basis. More frequent reports may be required should the Work fall behind the accepted schedule.
      a. Submit a weekly report to coordinate with and supplement the monthly construction progress report and which details Work scheduled for the following one-week interval, including:
         (1) Work activities which will occur.
         (2) Number and size of crews.
         (3) Construction equipment on Site.
         (4) Major items of Equipment and Material to be installed.
      b. Format shall be electronic.
   2. Construction progress reports shall consist of the revised construction progress schedule and a narrative report which shall include but not be limited to the following:
      a. Comparison of actual progress to planned progress shown on originally accepted schedule.
      b. Summary of activities completed since the previous construction progress report.
      c. Summary of activities planned for next reporting period.
      d. Planned, earned, and spent earned value analysis for the month.
      e. Identification of problem areas.
      f. A description of current and anticipated delaying factors, if any.
      g. Impact of possible delaying factors.
      h. Proposed corrective actions.
   3. Submit a construction progress report to Engineer with each application for partial payment. Work reported complete but not readily apparent to Engineer must be substantiated with supporting data when requested by Engineer.
   4. If a schedule update reveals that, through no fault of Owner, the Work is likely to be completed later than the Contract completion date, Contractor shall:
      a. Establish a plan for making up lost time.
         (1) Increase number of workers, or

(2) Increase amount or kinds of tools, or
(3) Work overtime or additional shifts, or
(4) A combination of 2 or more of the above 3 actions.

b. Submit plan to Owner and Engineer before implementing the plan.
c. Take actions as necessary to get the Work back on schedule at no additional cost to Owner.

B. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project Site:
1. List of Subcontractors at Project Site.
2. List of separate contractors at Project Site.
3. Approximate count of personnel at Project Site, and breakdown by craft.
4. Equipment at Project Site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.

C. Equipment and Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of Equipment and Materials delivered to and stored at Project Site. List shall be cumulative, showing Equipment and Materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for Materials or items of Equipment fabricated or stored away from Project Site.

D. Field Condition Reports: Promptly on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for information (RFI). Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

E. Special Reports:
1. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
2. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project Site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.01 CONSTRUCTION PROGRESS SCHEDULE:

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
2. Meetings: Scheduling consultant shall attend all meetings related to construction progress, alleged delays, and time impact.

B. Construction Progress Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled construction progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate actual completion percentage for each activity.

C. Distribution: Distribute copies of accepted schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes definitions, descriptions, transmittal, and review of Submittals.

B. Related Work Specified Elsewhere:

1. SECTION 013100 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS.
2. SECTION 017800 - CONTRACT CLOSEOUT.

1.02 GENERAL INFORMATION:

A. Definitions:

1. Shop Drawings, product data, and Samples are technical Submittals prepared by Contractor, Subcontractor, manufacturer, or Supplier and submitted by Contractor to Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each Division of the Specifications.
   a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
   b. Product data includes standard printed information on materials, products, and systems; not custom-prepared for this Project, other than the designation of selections from available choices.
   c. Samples include both fabricated and unfabricated physical examples of materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
   d. Descriptions of submittal requirements (as applicable) are defined in Appendix B – Submittal Descriptions.
2. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or Samples.
   a. Technical reports include laboratory reports, tests, technical procedures, technical records, and Contractor's design analysis.
   b. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, Bonds, Project photographs, physical work records, statements of applicability, copies of industry standards, Project record data, schedules, security/protection/safety data, and similar type Submittals.
   c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
3. Refer to ARTICLES 1.03 and 1.04 of this Part for detailed lists of Submittals and specific requirements.

B. Quality Requirements:

1. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings such as reproducibles shall be useable for further reproduction to yield legible hard copy.

2. Documents submitted to Engineer that do not conform to specified requirements shall be subject to rejection by Engineer, and upon request by Engineer, Contractor shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Contractor's (or their Subcontractor's) failure to initially satisfy the legibility quality requirements will not relieve Contractor (or their Subcontractors) from meeting the required schedule for Submittals.

C. Language and Dimensions:
   1. All words and dimensional units shall be in the English language.
   2. Metric dimensional unit equivalents may be stated in addition to the English units. However, English units of measurement shall prevail.

D. Submittal Completeness:
   1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.
   2. Where standard drawings are furnished which cover a number of variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing.
   3. Reproductions or copies of Contract Drawings or portions thereof will not be accepted as complete fabrication or erection drawings. Contractor may use a reproduction of Contract Drawings for erection drawings to indicate information on erection or to identify detail drawing references. Whenever the Drawings are revised to show this additional Contractor information, Engineer's title block shall be replaced with Contractor's title block, and Engineer's professional seal shall be removed from the drawing. Contractor shall revise these erection drawings for subsequent Engineer revisions to the Contract Drawings.

E. Form of Submittals:
   1. Submittals and other Project documents shall be transmitted in electronic format as specified.
      a. Selected Submittals may be provided in paper ("hardcopy") copies with advance approval of Engineer, and using procedures specified herein.
      b. Equipment instruction books and operating manuals shall be provided in paper copies in addition to specified electronic format.
   2. Electronic Format using Engineer's Document Management System:
      a. Scanned Submittals and documents are not acceptable. Transmit Submittal and Project documents in:
         (1) Adobe *PDF files created directly from native electronic format, or
         (2) Engineer-approved equal.
         (3) Electronic Submittals in .tif format are permitted only with specific Engineer approval.
      b. Each drawing shall be submitted with an electronic filename that is equivalent to the drawing number, and any resubmitted drawing shall use the same filename as the original file name each time.
      c. Contractor Submittals shall be accompanied with a completed transmittal letter. Submittals that are not accompanied with an approved transmittal letter will not be accepted and will be returned to Contractor.

d. All Contractor transmittal letters submitted to Engineer shall be in the form supplied and shall contain as a minimum the following information:
   (1) Contractor's Name.
   (2) Engineer's Project number.
   (3) Engineer's Contract number.
   (4) Filename.
   (5) Description of the information contained in the specific Submittal.
   (6) Revision number.
   (7) Submittal type.
   (8) Date of Submittal.

e. Nonconforming Submittals are subject to rejection by Engineer.

f. Provide "as-constructed" Submittals, record documents, Equipment instruction books and operating manuals, and other documents on CD-ROM in the latest version of AutoCAD format or as required and approved by Owner.

3. Engineer's review comments will be provided electronically in Adobe *PDF format.

4. Digital delivery media for transmittal of electronic documents and Submittals shall be through Engineer's Document Management (DM) Project website in accordance with the procedures specified herein, as addressed below. More information will be provided in the pre-construction conference for this Contract.
   a. DM guidelines and procedures:
      (1) Contractor shall complete the DM transmittal letter spreadsheet (provided by Engineer after award), package Submittals in one ZIP file, and upload transmittal to the DM website.
      (2) Contractor shall collect and download reviewed Submittals after notification from Engineer that the reviewed Submittals have been posted to the DM website.
      (3) A confirmation email is automatically distributed to Contractor after a successful upload to the DM website. If a confirmation email is not received by Contractor, a potential error has occurred; and Contractor shall contact Engineer.
   b. Refer to Appendix 013300-D for summary of DM System.

1.03 TECHNICAL SUBMITTALS:

A. Items shall include, but not be limited to, the following:
   1. All items listed in the technical sections of DIVISIONS 3 through 33.
   2. Manufacturer's specifications.
   3. Shop fabrication and erection drawings.
   4. Bills of material.
   5. Concrete mix design information.
   6. All drawings, catalogs or parts thereof, manufacturer's specifications and data, instructions, and other information specified or necessary:
      a. For Owner and Engineer to determine that the Equipment and Materials conform with the design concept and comply with the intent of the Contract Documents.
      b. For proper erection, installation, operation, and maintenance of the Equipment and Materials which Owner and Engineer will review for general content but not for basic details.

B. Schedule of Submittals:
   1. Prepare for Engineer's concurrence, a schedule for submission of all Submittals specified or necessary for Engineer's approval of the use of Equipment and Materials proposed for

incorporation in the Work or needed for proper installation, operation, or maintenance. Submit the schedule with the procurement schedule and construction progress schedule. Schedule submission of all Submittals to permit review, fabrication, and delivery in time so as to not cause a delay in the Work of Contractor or his Subcontractors or any other contractors as described in the Contract Documents.

2. In establishing schedule for Submittals, allow 7 Days in Engineer's office for reviewing original Submittals and 7 Days in Engineer's office for reviewing resubmittals.
3. Submittals requiring revision shall be resubmitted within 7 Days after receipt of Engineer's review notations.
4. The schedule shall indicate the anticipated dates of original submission for each item and Engineer's approval thereof, and shall be based upon at least one resubmission of each item.
5. Schedule all Submittals required prior to fabrication or manufacture for submission within 5 Days of the Notice to Proceed. Schedule Submittals pertaining to storage, installation, and operation at the Site for Engineer's approval prior to delivery of the Equipment and Materials.
6. Resubmit Submittals the number of times required for Engineer's "Submittal Approved." However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining approval of Submittals, will not be grounds for extension of the Contract Times, provided Engineer completes his reviews within the times specified.
7. Where a Submittal is required by the Contract Documents or the accepted schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertaining Submittal will be at the sole expense and responsibility of Contractor.

C. Transmittal of Submittals:
   1. All Submittals for Equipment and Materials furnished by Contractor, Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor.
   2. After checking and verifying all field measurements, transmit all Submittals to Engineer for approval as follows:
      a. Submittal Information Block:
         (1) Affix to all paper copies whether Submittal is prepared by Contractor, Subcontractor, or Supplier. Use transparent decal type Submittal Information Blocks for Shop Drawings and use gummed paper type for product data and Sample Submittals. All Submittal Information Blocks needed for this Contract will be furnished to Contractor at no charge at the initial coordination conference.
         (2) Electronic files of Submittal Information Blocks will be provided to Contractor for use on electronic Submittals.
      b. Mark each Submittal by Project name and number, Contract title and number, and applicable Specification Section and Article number. Include in the letter of transmittal the Drawing number and title, sheet number (if applicable), revision number, and electronic filename (if applicable). Unidentifiable Submittals will be returned for proper identification.
      c. Check and approve Submittals of Subcontractors, Suppliers, and manufacturers prior to transmitting them to Engineer. Contractor's submission shall constitute a representation to Owner and Engineer that Contractor approves Submittals and has determined and verified all design criteria, quantities, dimensions, field construction and installation criteria, materials, catalog numbers, compliance with Laws and Regulations, and similar data, and Contractor assumes full responsibility for doing

so; and Contractor has coordinated each Submittal with the requirements of the Work and the Contract Documents.

d. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from requirements of the Contract Documents.

e. Make all modifications noted or indicated by Engineer and return the required number of revised Submittals until approved. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by Engineer on previous Submittals. After paper copy Submittals have been approved, submit copies thereof for final distribution. Previously approved Submittals transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.

f. Following completion of the Work and prior to final payment, furnish record documents and approved Samples and Shop Drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. Furnish additional copies for insertion in Equipment instruction books and operating manuals as required. All such copies shall be clearly marked "PROJECT RECORD."

(1) Submit a final record copy of the Master Field Drawing list which shall indicate the final revision status of each drawing on the list.

g. Keep a copy or sample of each Submittal in good order at the Site.

3. Quantity Requirements:

a. Except as otherwise specified, transmit all Shop Drawings in the following quantities:

(1) Initial Submittal:
(a) Electronic - One copy to Engineer.

(2) Resubmittals:
(a) Electronic - One copy to Engineer.

(3) Submittal for final distribution:
(a) Paper – Two copies plus the number required by Contractor, to Engineer.
(b) Electronic - One copy to Engineer.

(4) As-constructed documents:
(a) Paper - Four copies to Engineer.
(b) Electronic - One copy to Engineer and one copy to Owner.

b. Transmit Submittals of product data as follows:

(1) Initial Submittal:
(a) Electronic - One copy to Engineer.

(2) Resubmittals:
(a) Electronic - One copy to Engineer.

(3) Submittal for final distribution:
(a) Electronic - One copy to Engineer.

c. When all Submittals have been updated to "as-constructed" conditions, transmit to Engineer and to Owner in electronic format.

d. Owner may copy and use for internal operations and staff training purposes any and all document Submittals required by this Contract and approved for final distribution, whether or not such documents are copyrighted, at no additional cost to Owner. If permission to copy any such Submittal for the purposes stated is unreasonably withheld from Owner by Contractor or any Subcontractor,

manufacturer, or Supplier, Contractor shall provide to Engineer 20 copies plus the number of copies required by Contractor at each final distribution issue.

4. Equipment erection drawings and other Submittals required for installation of Equipment furnished by others under separate contract for installation under this Contract will be transmitted to Contractor by Engineer in the final distribution of such Submittals.
5. Information to Manufacturer's District Office: Contractor shall arrange for manufacturers and Suppliers of Equipment and Materials to furnish copies of all agreements, drawings, specifications, operating instructions, correspondence, and other matters associated with this Contract to the manufacturer's district office servicing Owner. Insofar as practicable, all business matters relative to Equipment and Materials included in this Contract shall be conducted through such local district offices.

D. Engineer's Review:
1. Engineer will review and take appropriate action on Submittals in accordance with the accepted schedule of Submittals. Engineer's review and approval will be only to determine if the items of Equipment and Materials covered by the Submittals will, after installation or incorporation in the Work, conform to information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to design data reflected in Submittals which is peculiarly within the special expertise of Contractor or Contractor's Subcontractors or Suppliers. Review and approval of a component item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval of Shop Drawings, product data, or Samples will not relieve Contractor of responsibility for any deviation from requirements of the Contract Documents unless Contractor has in writing called Engineer's attention to such deviation at the time of submission, and Engineer has given written concurrence in and approval of the specific deviation. Approval by Engineer shall not relieve Contractor from responsibility for errors or omissions in Submittals.

E. Submittal Action Stamp:
1. Engineer's review action stamp, appropriately completed, will appear on all Submittals of Contractor when returned by Engineer. Review status designations listed on Engineer's action stamp are defined as follows:

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

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

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

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

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

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

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

1.04 INFORMATIONAL SUBMITTALS:

A. Informational Submittals are comprised of technical reports, administrative Submittals, and guarantees which relate to the Work, but do not require Engineer approval prior to proceeding with the Work. Informational Submittals include:
   1. Field test reports.
   2. Certification on Materials:
      a. Steel mill tests.

3. Soil test reports.
4. Job progress schedules.
5. Equipment and Material delivery schedules.
6. Progress photographs.
7. Warranties and guarantees.

B. Transmittal of Informational Submittals:
   1. All informational Submittals furnished by Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor unless otherwise specified.
      a. Identify each informational Submittal by Project name and number, Contract title and number, and Specification Section and Article number marked thereon or in letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
      b. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from requirements of the Contract Documents.
   2. Quantity Requirements:
      a. Technical reports and administrative Submittals except as otherwise specified:
         (1) Electronic: One to Engineer.
   3. Test Reports:
      a. Responsibilities of Contractor, Owner, and Engineer regarding tests and inspections of Equipment and Materials and completed Work are set forth elsewhere in these Contract Documents.
      b. The party specified responsible for testing or inspection shall in each case, unless otherwise specified, arrange for the testing laboratory or reporting agency to distribute test reports as follows:
         (1) Owner: One copy.
         (2) Engineer: One copy.
         (3) Contractor: One copy.

C. Engineer's Review:
   1. Engineer will review informational Submittals for indications of Work or Material deficiencies.
   2. Engineer will respond to Contractor on those informational Submittals which indicate Work or Material deficiency.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION – Not Applicable.

END OF SECTION 013300

APPENDIX 013301-A

SUBMITTAL SCHEDULE

LEGEND: E = Electronic; P(x) = Paper Copy (no. of copies); NTP = Notice to Proceed

Pkg ID	Package Description	Subj. To LDs *	With Proposal	For Approval (required prior to fabrication)	For Information/ Certification/Construction
1	Certificate of Insurance	No			P (1) - 14 days after NTP
2	Acknowledge Acceptance and Return of Contract.	No			P (3) - 7 days after Receipt of Contract
3	Letter of Credit or Performance Bond if required	No			P (1) - 10 business days after NTP
4	Notice of any Cancellation, Termination, or Material Changes of Insurance Policies	No			30 days before cancellation or change
5	Detailed Work Progress Schedule	No		E - 10 days after NTP, monthly thereafter	
6	Manufacturer Field Staffing Plan, including Names and Durations of Visits	No			E - 10 days before arrival to Site
7	Progress Reports	No			E - 10 days after NTP, monthly through engineering and fabrication, and with each invoice for partial payment.
8	Partial Lien Waiver	No			With Invoice
9	Quality Assurance / Quality Control Manuals, unless on file with Purchaser's QA/QC Department	No	E		
10	Copies of Certified Test and Inspection Reports	No			E - 15 days after test
11	Transportation / Shipping Plan	No			E - 10 days before first shipment
12	Notice of Shipment	No			E - two weeks prior to shipment
13	Erection / Installation / Assembly Instructions	No			E - 10 days prior to contract delivery date
14	Material Safety Data Sheets (if applicable)	No			E - 10 day prior to shipment
15	Final Bill of Materials	No			E - Prior to Final Payment
16	Final Lien Waiver	No			With Final Invoice
17	Final As-Manufactured Submittals	Yes			E - Prior to Delivery
18	All Remaining Submittals Not Listed, but Specified in Divisions 1 through 48	No		As required to meet schedule.	E - 30 days after NTP
	CIVIL				
C1	Erosion Control Plan	Yes		E - 14 Days after NTP	
C2	Dewatering and Excavation Plan	Yes		E - 14 Days after NTP	
C3	Certifications and Catalog Cuts outlined in Division 31 and 32.	No		E - 6 weeks prior to start of placement of material.	
	STRUCTURAL				
S1	Concrete Mix Design	No	~~E~~	E - 14 Days after NTP	
S2	Reinforcing Steel Bar Schedule, Bar Details, and Erection Drawings	Yes	~~E~~	E - 21 Days after NTP	
S3	Product Data	No	~~E~~	E - 21 Days after NTP	
S4	Anchor Bolt Fabrication and Erection Drawings	Yes	~~E~~	E - 21 Days after NTP	
	MECHANICAL				
M1	Piping fabrication drawings	No		E - 30 Days after NTP	
M2	Material Catalog Cuts	No		E - 30 Days after NTP	
	ELECTRICAL				
E1	Cable	No		E - 21 Days after NTP	
E2	Ground Rods	No		E - 21 Days after NTP	
E3	Connection Materials	No		E - 21 Days after NTP	

APPENDIX B

Submittal Description

Foundation Details
- Reinforcing steel bar schedule, bar details, and erection drawings.
- Concrete Mix Designs.
- Product Data

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

Civil
- Erosion Control Plan
- Dewatering Plan
- Crushed Rock Aggregate and Crushed Concrete Aggregate Surfacing Gradation and Certificates
- Granular and Trench Stabilization Material Lab Test Results

Piping Information
- Piping fabrication drawings
- Material Catalog Cuts

Electrical
- Cable and equipment catalog cut sheets

APPENDIX 013300-D – DOCUMENT MANAGEMENT SYSTEM AND MANAGEMENT

Vendor Submittal Reference Document

Overview:

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

It is a step by step guide on:

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

Vendor Submittal Reference Document

Logging In:

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

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

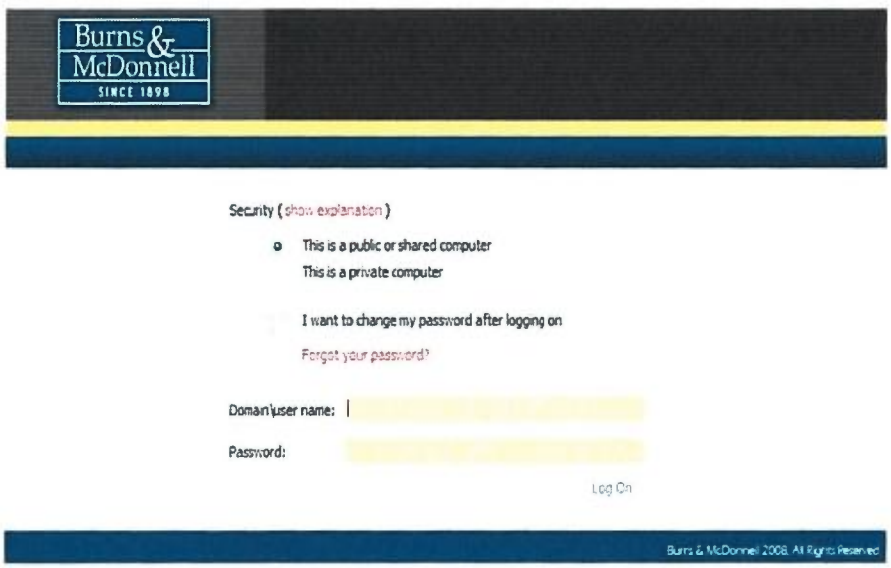
Previously you were not able to change the password you received, but now it can be reset after using the initial password from BMcD. After changing the password it cannot be changed again for 24 hours. Previously used passwords cannot be used again. The Domain is BMCDEXT and should preface your username.

To Login:

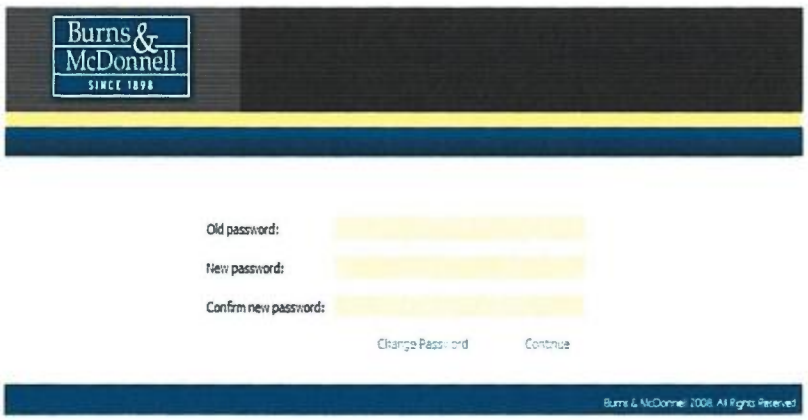
The Domain is BMCDEXT and should be typed in before the user name. **NOTE: Make sure you select This is a private computer-this will remember your login information so you will not have to type in your username and password again. Example: BMcDext\[user ID] so the information would be BMcDEXT\ext_jdoe.**

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

Login Screen:



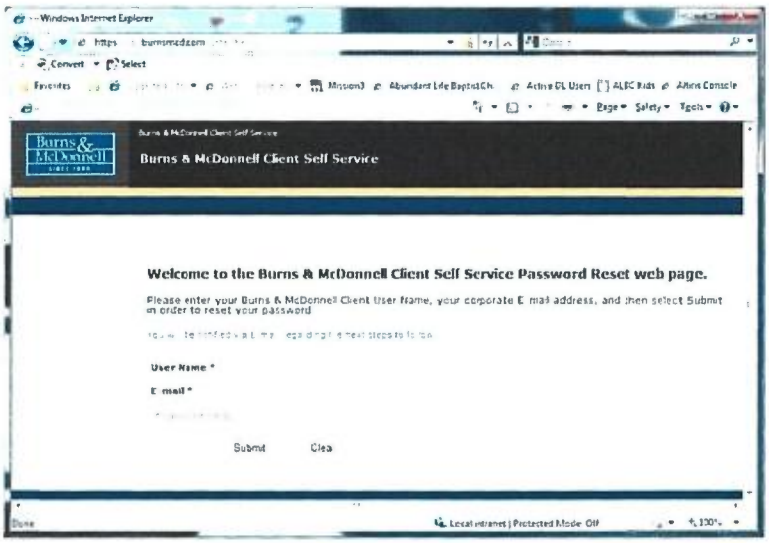
Set New Password screen:



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

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

Request New Password screen:



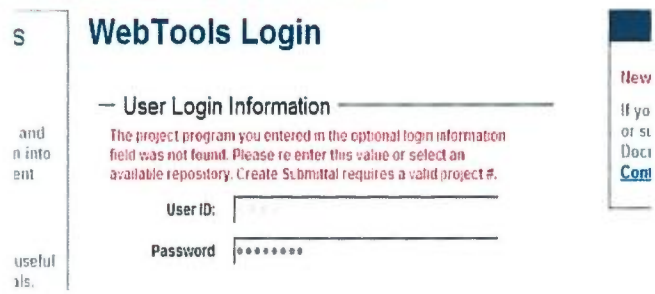
Creating a Submittal:

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

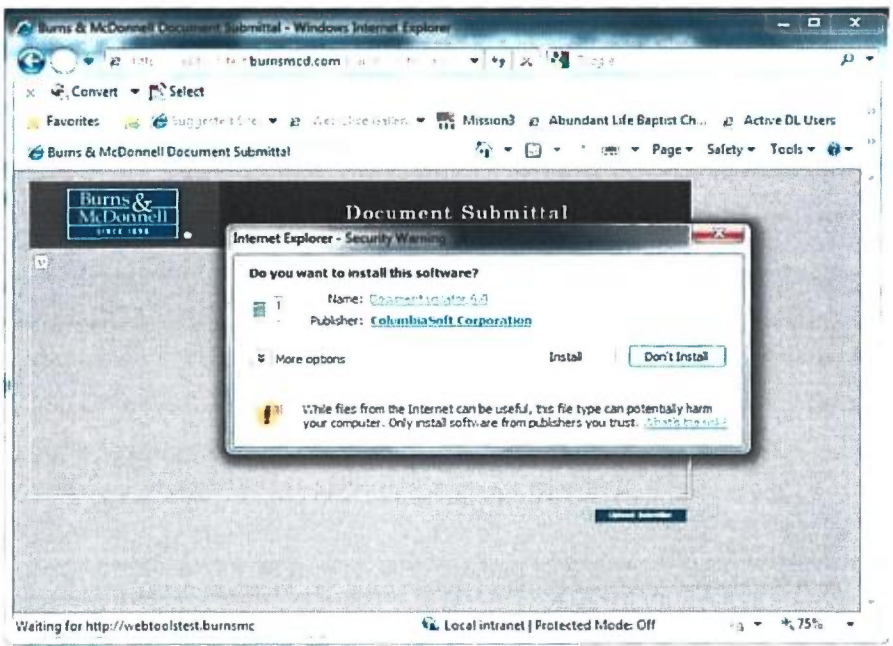
Your username and password information will be automatically populated into the BMcD Login screen.

1. To create a submittal click in the Project/Program text box and fill in with the appropriate project name or program number, then click Create Submittal.
   If a reminder of the appropriate project number is needed, log in to WebTools and view the available project number folders. By clicking on the "Documents" folder the list of available project number will be seen. Descriptions of those projects will be given on the right hand window pane. After the proper project number is verified, log back out to return to the Create Submittal option.
   Note: When creating a Submittal, the Repository information is not needed.

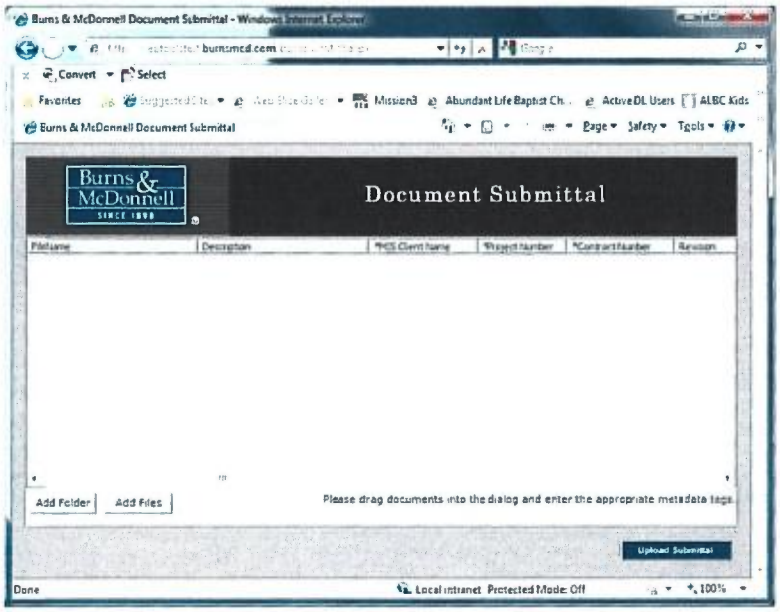
If the number is incorrectly entered the following error message will be displayed.
Check the number, if you believe you received this message in error you will need to contact your BMCD Document Control contact.



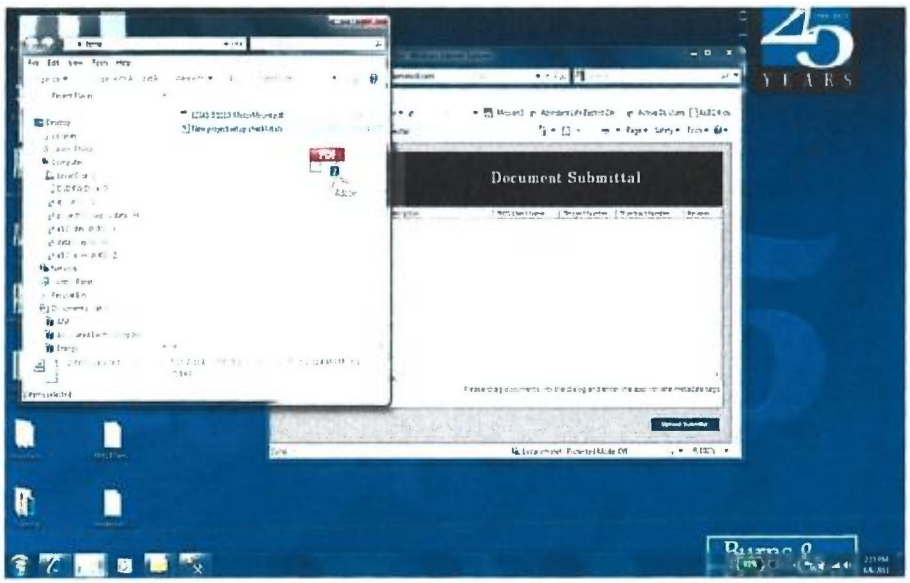
- If this is the first time you are visiting the Submittal screen then you will be prompted to load the ActiveX Add-On that will allow you to drag and drop documents into the screen. Click on Install to load the ActiveX Add-On.
  Note: Some companies prohibit the install of an ActiveX Add-On. If this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



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



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



Vendor Submittal Reference Document

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

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

Note: For document types and filenames see section 1.02 E of the 013300, 013301, 013304 or 013305 General Requirements specification.

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

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

  Do not include the following in the filenames:

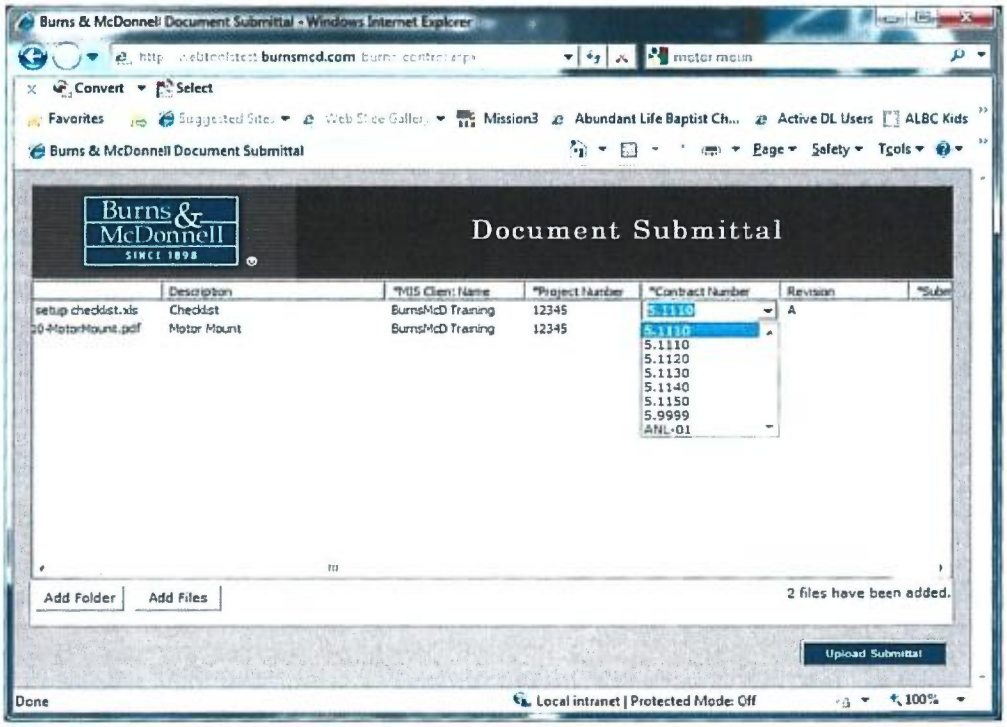
  a. Revision
  b. Dates
  c. File Description or Document Title
  d. Transmittal Information

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

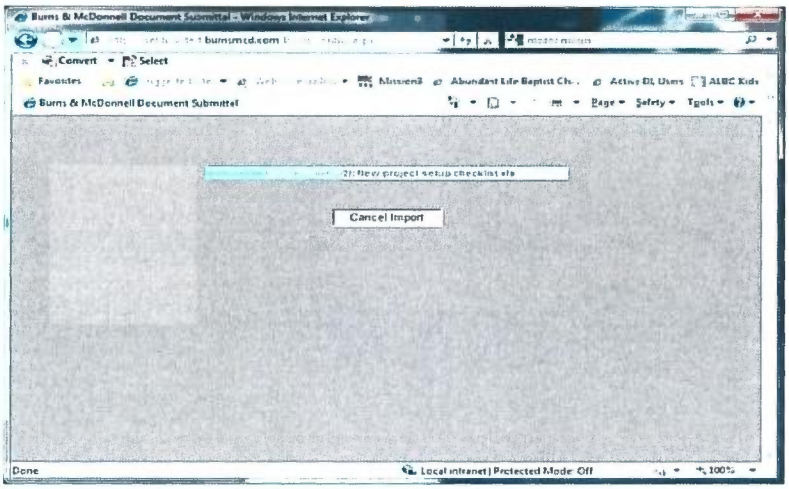
Valid filename examples: A07-9877-8-1.pdf, M-114-1-par.pdf, A-347-wps.pdf, 18555-18 ASME calcs.pdf, Terminal Point List.pdf

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

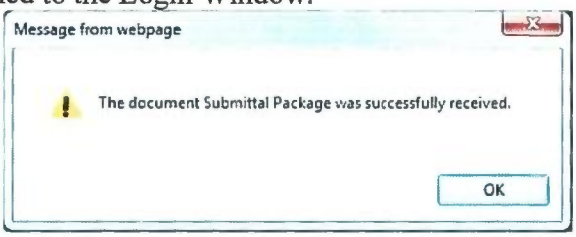
Vendor Submittal Reference Document



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



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



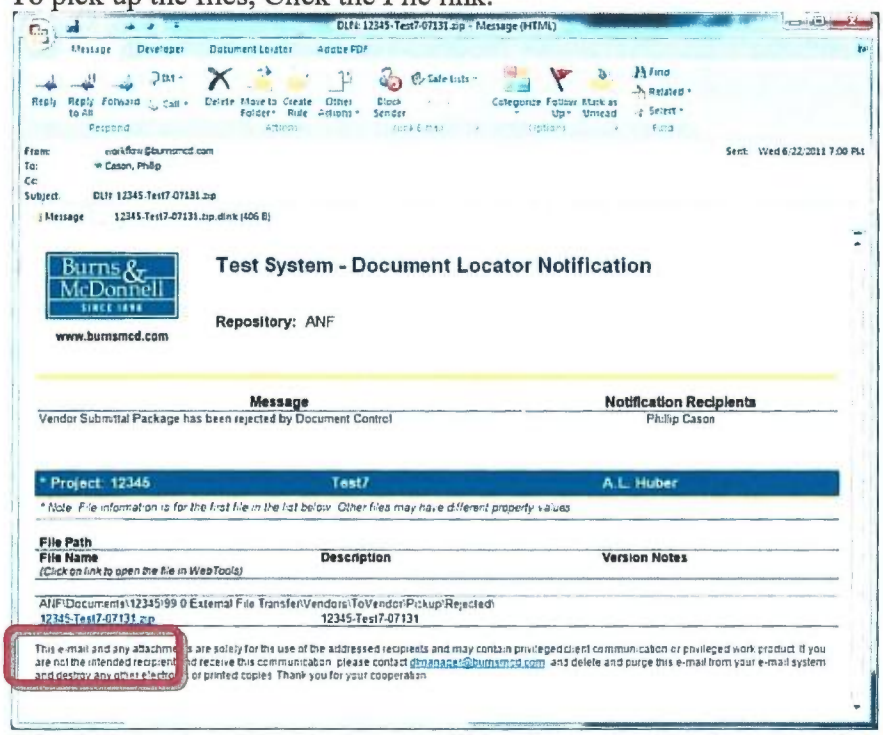
Notification of Receipt:

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

Picking up a Reviewed Submittal

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

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



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

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

SECTION 015100 - TEMPORARY UTILITIES AND FACILITIES

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes requirements of a temporary nature not normally incorporated into final Work. It includes the following:
   1. Utility services.
   2. Construction and support facilities.
   3. Construction aids.
   4. Safety and health.
   5. Fire protection.

B. Related Work Specified Elsewhere:
   1. Temporary Barriers and Controls: SECTION 015700.
   2. Field Offices and Sheds: SECTION 015200.

1.02 REFERENCES:

A. American National Standards Association (ANSI):
   1. A10 Series - Safety Requirements for Construction and Demolition.

B. National Electrical Contractors Association (NECA):
   1. Electrical Design Library - Temporary Electrical Facilities.

C. National Fire Protection Association (NFPA):
   1. 10 - Portable Fire Extinguishers.
   2. 70 - National Electrical Code.
   3. 241 - Safeguarding Construction, Alterations, and Demolition Operations.

D. National Electrical Manufacturers Association (NEMA).

E. Underwriters Laboratories (UL).

1.03 SUBMITTALS:

A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

1.04 QUALITY ASSURANCE:

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
   1. Building Code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, Fire Department, and rescue squad rules.
   5. Environmental protection regulations.

B. Standards:
   1. Comply with NFPA 10 and 241, and ANSI A10 Series standards "Temporary Electrical Facilities."
   2. Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS:

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, unsanitary conditions, or public nuisances to develop or persist on the Site.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT:

A. Provide new materials and equipment. If acceptable to Engineer, undamaged previously used materials and equipment in serviceable condition may be used. Provide materials and equipment suitable for the use intended, of capacity for required usage, and meeting applicable codes and standards. Comply with requirements of DIVISIONS 3 through 33.

B. Water: Provide a tie-in to the plant potable water system indicated on the Green Station Outage Lay Down Map.

C. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

D. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

E. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

F. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

G. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

H. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.01 TEMPORARY UTILITIES:

A. General:

1. If necessary, engage the appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service,

provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

2. Provide adequate utility capacity at each stage of construction. Prior to availability of temporary utilities at the Site, provide trucked-in services as required for start-up of construction operations.
3. Obtain and pay for temporary easements required to bring temporary utilities to the Project Site, where Owner's permanent easement cannot be used for that purpose.
4. Furnish, install, and maintain temporary utilities required for adequate construction, safety, and security. Modify, relocate, and extend systems as Work progresses. Repair damage caused by installation or use of temporary facilities. Grade the areas of Site affected by temporary installations to required elevations and grades, and clean the area. Remove on completion of Work or until service or facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
5. The types of temporary construction utilities and facilities required include, but not by way of limitation, water distribution, drainage, dewatering equipment, enclosure of Work, heat, ventilation, electrical power distribution, lighting, hoisting facilities, stairs, ladders, and roads.
6. Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities, and obtain required certifications and permits for use.
7. Materials used for temporary service shall not be used in the permanent system unless so specified or acceptable to Engineer.

B. Because of operational requirements, Owner may restrict or curtail Contractor's use of electric power, water, and compressed air. If these utilities are critical to Contractor's operations and completion of the Contract on the agreed schedule, Contractor shall consider furnishing alternate sources for its own use. Restriction or curtailment of these utilities shall not be a basis for a claim against Owner or an extension of the agreed schedule.

3.02 TEMPORARY ELECTRICITY AND LIGHTING:

A. Use of Existing System:
   1. Owner's existing system may be used for temporary electricity.
   2. Owner personnel will provide connections to existing facilities, sized to provide service required for power and lighting.
   3. Modify, supplement, and extend service as necessary to meet needed requirements and prevent overloading of existing system.
   4. Protect system to prevent interference with Owner's normal usage.

B. Use of Permanent System:
   1. Prior to use of permanent system for construction purposes, obtain written permission of Owner.
   2. Maintain permanent system as specified for temporary facilities.

C. Costs of Installation and Operation:
   1. Pay fees and charges for permits and applications.
   2. Pay costs of installation, maintenance, removal of temporary services, and restoration of any permanent facilities used.
   3. Cost of power used will be paid by Owner.
   4. Obtain and pay costs for temporary easements required across properties other than that of Owner.

3.03 TEMPORARY HEAT AND VENTILATION:

A. General:
   1. Provide temporary heat, ventilation, and cooling as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage. Protect from adverse affects of low temperatures or high humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
   2. Methods of heating and fuel shall be suitable for particular purposes. Portable heaters shall be standard approved units with controls.

B. Use of Existing Systems:
   1. Existing systems shall not be used for temporary heating, cooling, or ventilating.

C. Use of Permanent System:
   1. Prior to use of permanent system, obtain written permission of Owner, which will define:
      a. Conditions of use.
      b. Provisions relating to guarantees on equipment.
   2. Prior to operation, verify that inspection has been made by proper authorities and installation has been approved for operation.
   3. Install temporary filters for air-handling units and for permanent ducts. Install new filters upon Substantial Completion.
   4. Provide operation and maintenance of systems.
   5. Place operational zones of permanent HVAC system in use sequentially as respective areas of Project become adequately enclosed for efficient operation.

D. Costs of Installation and Operation:
   1. Pay fees and charges for applications, permits, and inspections.
   2. Pay costs of installation, operation, maintenance, removal of equipment, and restoration of existing or permanent facilities if used.
   3. Pay cost of power and fuel used.

3.04 TEMPORARY WATER:

A. Use of Existing System:
   1. Owner's existing system may be used for temporary water.
   2. Make connections to existing facilities to provide water for construction purposes.
      a. Water Source: Make connections to Owner's service located at point indicated on the Green Station Outage Lay Down Map.
   3. Modify, supplement, and extend system as necessary to meet temporary water requirements and prevent overloading of existing system.
   4. Regulate system to prevent interference with Owner's usage.

B. Use of Permanent System:
   1. Prior to use of permanent system for construction purposes, obtain written permission of Owner.
   2. Prior to Use of System for Drinking Water:
      a. Permanent system is not to be used for drinking water. Contractor is responsible for the supply of drinking water.

C. Costs of Installation and Operation:
   1. Pay all costs for installation, maintenance, and removal.
   2. Cost of water used will be paid by Owner.

3.05 TEMPORARY TELEPHONE SERVICE:

A. General:
   1. Arrange with local telephone service company and provide direct line telephone service at the construction Site for the use of construction personnel and employees.
   2. Arrange with local cellular/mobile telephone service company and provide mobile telephone service for use by Contractor and so Contractor can be reached at construction Site during normal working hours.

B. Costs of Installation and Operation:
   1. Pay all costs for installation, maintenance and removal, and service charges for local calls. Toll charges shall be paid by the party who places the call.

3.06 TEMPORARY SANITARY FACILITIES:

A. Contractor-Furnished Facilities:
   1. Furnish, install, and maintain temporary sanitary facilities for use through construction period. Remove on completion of Work.
   2. Provide for all construction workers under this Contract and representatives at the Site.
   3. Toilet facilities shall be of the chemical, aerated recirculation, or combustion type, properly vented, and fully enclosed with a glass- fiber-reinforced polyester shell or similar nonabsorbent material.
   4. Water and sewer connected facilities may be installed to extent permitted by governing regulations.
      a. Provide lavatories, mirrors, urinals (where applicable), and water closets in water and sewer connected units. Provide only potable water at lavatories. Provide individual compartments for water closets where the unit is intended for occupancy by more than one person. Provide suitable enclosure with nonabsorbent sanitary finish materials and adequate heat, ventilation, and lighting.
      b. Provide separate toilet facilities for male and female construction personnel as required.
   5. Wash Facilities: Install potable water-supplied wash facilities at locations convenient to construction personnel involved in the handling of compounds and materials where wash-up is necessary to maintain a safe, healthy and sanitary condition. Where recommended or required by governing authorities and regulations or recognized standards provide emergency safety showers, emergency eye-wash fountains, showers, and similar facilities. Dispose of drainage properly. Supply soap and other cleaning compounds appropriate for each condition.
   6. Drinking Water Fixtures: Provide containerized tap-dispenser type drinking water units. Provide drinking water fountains if piped potable water is reasonably accessible from permanent or temporary lines.
   7. Supply and maintain toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility. Provide appropriate covered waste containers for used material.

B. Use of Existing Facilities:
   1. Existing restrooms facilities shall not be used.

C. Use of Permanent Facilities:
   1. Permanent sanitary facilities shall not be used by construction personnel.

3.07 SEWERS AND DRAINAGE:

A. General: Where sewers or drainage facilities are not available for discharge of effluent, provide containers to remove and dispose of effluent off the Site in a lawful manner. If existing sewers are available for temporary drainage near the Site prior to completion of permanent sewers, provide temporary connections to remove effluent that can be lawfully discharged into the sewers. If existing sewers cannot be used for discharge, provide drainage ditches, dry wells, waste stabilization ponds, and similar discharge facilities to remove effluent that can be lawfully discharged in that manner.

B. Connect temporary sewers to the municipal sewer systems in the manner directed by the sewer department officials.

C. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy usage, restore to normal conditions promptly. Provide and maintain temporary earthen embankments and similar barriers in and around construction excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rain storms.

3.08 TEMPORARY CONSTRUCTION AIDS:

A. General:
   1. Provide construction aids and equipment required by personnel and to facilitate the execution of the Work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other such facilities and equipment.
   2. Materials may be new or used, must be suitable for the intended purpose, and meet the requirements of applicable codes, regulations, and standards.
   3. When permanent stair framing is in place, provide temporary treads, platforms, and railings for use by construction personnel.

B. Use of Existing Stairs, Elevators, Hoists, and Similar Facilities:
   1. Stairs in existing building shall not be used by construction personnel.
   2. Elevators in the existing building shall not be used by construction personnel.
   3. Maintain all existing facilities and equipment in a condition equivalent to or better than condition at beginning of usage.

3.09 TEMPORARY ENCLOSURES:

A. New Construction:
   1. Provide temporary enclosure of exterior walls as Work progresses, to provide acceptable working conditions, weather protection for interior materials, allow for effective temporary heating, and to prevent entry of unauthorized persons.
      a. Provide temporary exterior doors with hardware, including being lockable.
      b. Other enclosures shall be removable as necessary for Work and for handling of materials.
   2. Restore permanent facilities used for temporary purposes to specified condition.

B. Existing Construction:
   1. Provide temporary enclosures to separate Work areas from the areas of existing building occupied by Owner to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, and to protect Owner's employees and operations from construction Work.
      a. Temporary Partition and Ceiling Enclosures: Framing and sheet materials which comply with structural and fire rating requirements of applicable codes and standards.

b. Close joints between sheet materials and seal edges and intersections with existing surfaces. Prevent penetration of dust or moisture.
c. In locations where fire protection is required, provide the fire protection as required by local fire regulations.

2. Restore existing facilities used for temporary purposes to original or better condition.

3.10 TEMPORARY SAFETY AND HEALTH:

A. General: Contractor shall be solely responsible for initiating, maintaining, and supervising all safety and health precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide necessary protections to prevent injury or loss to, all employees on the Work and other persons and organizations who may be affected thereby.

3.11 TEMPORARY FIRE PROTECTION:

A. General:
1. Contractor shall be responsible for development of a fire prevention and protection program for all Work under this Contract.
2. The program shall comply with the applicable provisions for safety and protection specified in the Contract Documents and with applicable parts of the NFPA 10 and 241.
3. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near such usable stairwell.
4. Store combustible materials in containers in fire-safe locations.
5. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
6. Provide supervision of welding operations and similar sources of fire ignition.
7. Post warning and instructions at each extinguisher location, and instruct construction personnel on proper use of extinguishers and other available facilities at Project Site. Post local fire department telephone number on or near each telephone instrument at Project Site.

B. Permanent Fire Protection:
1. Complete each fire protection facility at earliest reasonable date, place into operation, and make ready for emergency use.
2. Instruct personnel at Site on availability and proper use.

3.12 INSTALLATION AND REMOVAL:

A. Relocation: Relocate construction aids as required by progress of construction, storage limitations, or Work requirements and to accommodate requirements of Owner and other contractors at the Site.

B. Removal: Remove temporary materials, equipment, and services when construction needs can be met and allowed by use of permanent construction, or at completion of the Project.

C. Repair: Clean and repair damage caused by installation or by use of temporary facilities.
1. Remove foundations and underground installations for construction aids.
2. Grade the areas of the Site affected by temporary installations to required elevations and clean the area.

END OF SECTION 015100

SECTION 015200 - FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes requirements for temporary field offices and other structures required for office and storage space required by Contractor.

B. Related Work Specified Elsewhere:
   1. Equipment and Materials: SECTION 016000.
   2. Temporary Utilities and Facilities: SECTION 015100.

C. Use of Existing Facilities:
   1. Existing facilities at the Site shall not be used for field offices.

D. Use of Permanent Facilities:
   1. Permanent facilities when substantially completed shall not be used for field offices or for storage.

PART 2 - PRODUCTS

2.01 FIELD OFFICES:

A. General:
   1. Provide trailers, mobile buildings, or buildings constructed with floors raised aboveground, with steps, landings, and railings at entrance doors.
   2. Buildings shall be structurally sound, secure, and weathertight.
   3. Provide appropriate type fire extinguishers at each office and storage area.
   4. Maintain offices during progress of the Work.
   5. Install office spaces ready for occupancy 15 Days after date stated in Notice to Proceed.

B. Contractor's Office:
   1. Provide a field office for Contractor's superintendent on the Site.
   2. It shall be of size required for general use, with lights, heat, furnishings, telephone service, and other necessary facilities and utilities required by Contractor's operations.

2.02 STORAGE SHEDS AND TRAILERS:

A. On Site:
   1. Provide temporary buildings or trailers needed for storage of Equipment and Materials installed under this Contract.
   2. Provide ventilation and heating as required by Equipment and Material stored.

B. Off Site:
   1. Advise Engineer of any arrangements made for storage of Equipment and Materials in a place other than Owner's Site. Furnish evidence of insurance coverage with Application for Payment as required by Owner.

PART 3 - EXECUTION

3.01 LOCATION, INSTALLATION AND MAINTENANCE:

A. General:
   1. Place temporary buildings, trailers, and stored materials in locations acceptable to Owner or Engineer.
   2. Install field offices and sheds to resist winds and elements of the locality where installed.
   3. Remove when no longer needed at the Site or when Work is completed.

4. Keep approach walks free of leaves, mud, water, ice, or snow.
5. At completion of Work, remove temporary buildings and trailers, foundations (if any), utility services, and debris.
6. Prepare ground or paved areas as specified in applicable Sections.

END OF SECTION 015200

SECTION 015700 - TEMPORARY BARRIERS AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes General Requirements for:
   1. Safety and protection of Work.
   2. Safety and protection of existing property.
   3. Barriers.
   4. Security.
   5. Environmental controls.
   6. Access roads and parking areas.
   7. Traffic control and use of roadways.

B. Related Work Specified Elsewhere:
   1. Temporary Utilities and Facilities: SECTION 015100.

PART 2 - PRODUCTS – Not Applicable.

PART 3 - EXECUTION

3.01 SAFETY AND PROTECTION OF WORK AND PROPERTY:

A. General:
   1. Provide for the safety and protection of the Work and of Materials and Equipment to be incorporated therein, whether in storage on or off the Site. Provide protection at all times against rain, wind, storms, frost, freezing, condensation, or heat so as to maintain all Work and Equipment and Materials free from injury or damage. At the end of each day, all new Work likely to be damaged shall be appropriately protected.
   2. Notify Engineer immediately at any time operations are stopped due to conditions which make it impossible to continue operations safely or to obtain proper results.
   3. Construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations, floors, pits, trenches, manholes, and ducts free of water.
   4. Protect floors from damage by proper covering and care when handling heavy equipment, painting, or handling mortar or other such materials. Use proper cribbing and shoring to prevent overloading of floors while moving heavy equipment. Provide metal pans under pipe-threading machines and clean such pans daily, keeping oil off floors. Restore floors to former condition where damaged or stained.
   5. Concrete floors less than 28 days old shall not be loaded without written permission from Engineer.
   6. Restrict access to roofs except as required by the Work. Where access is required, provide protection with plywood, boards, or other suitable materials.

B. Property Other than Owner's:
   1. Provide for the safety and protection of property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction. Report immediately to the owners thereof and promptly repair damage to existing facilities resulting from construction operations.
   2. Operation of valves or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.

3. Where fences are to be breached on private property, the owners thereof shall be contacted and arrangements made to ensure proper protection of any livestock or other property thus exposed.
4. The applicable requirements specified for protection of the Work shall also apply to the protection of existing property of others.
5. Before acceptance of the Work by Owner, restore all property affected by Contractor's operations to the original or better condition.

3.02 BARRIERS:

A. General:
1. Furnish, install, and maintain suitable barriers as required to prevent public entry, to protect the public, and to protect the Work, existing facilities, trees, and plants from construction operations. Remove when no longer needed or at completion of Work.
2. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards or regulatory agencies.
3. Barriers shall be of a neat and reasonable uniform appearance, structurally adequate for the required purposes.
4. Maintain barriers in good repair and clean condition for adequate visibility. Relocate barriers as required by progress of Work.
5. Repair damage caused by installation and restore area to original or better condition. Clean the area.

3.03 ENVIRONMENTAL CONTROLS:

A. Dust Control:
1. Provide positive methods and apply dust control materials to minimize raising dust from construction operations; and to prevent airborne dust from dispersing into the atmosphere.
2. Clean interior spaces prior to the start of finish painting and continue cleaning on an as-needed basis until painting is finished.
3. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

B. Water and Erosion Control:
1. Provide methods to control surface water to prevent damage to the Project, the Site, or adjoining properties.
2. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   a. Hold the areas of bare soil exposed at one time to a minimum.
   b. Provide temporary control measures such as berms, dikes, and drains.
3. Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels, and other construction areas; and to direct drainage to proper runoff.
4. Provide, operate, and maintain hydraulic equipment of adequate capacity to control surface and groundwater.
5. Treat and dispose of surface runoff water in a manner to prevent flooding, erosion, sedimentation, or other damage to any portion of the Site or to adjoining areas, and in a manner acceptable to authorities having jurisdiction.
6. Provide temporary drainage where the roofing or similar waterproof deck construction is completed prior to the connection and operation of the permanent drainage piping system.

C. Rodent Control:
   1. Provide rodent control as necessary to prevent infestation of construction or storage areas.
      a. Employ methods and use materials which will not adversely affect conditions at the Site or adjoining properties.
      b. Should the use of rodenticides be considered necessary, submit an informational copy of the proposed program to Owner with a copy to Engineer. Clearly indicate:
         (1) The area or areas to be treated.
         (2) The rodenticides to be used, with a copy of the manufacturer's printed instructions.
         (3) The pollution preventive measures to be employed.
   2. The use of any rodenticide shall be in accordance with the manufacturer's printed instructions and regulatory agencies.

D. Debris Control and Clean-Up:
   1. Keep the premises free at all times from accumulations of debris, waste materials, and rubbish caused by construction operations and employees. Responsibilities shall include:
      a. Adequate trash receptacles about the Site, emptied promptly when filled.
      b. Periodic cleanup to avoid hazards or interference with operations at the Site and to maintain the Site in a reasonably neat condition.
      c. The keeping of construction materials such as forms and scaffolding neatly stacked.
      d. Immediate cleanup to protect the Work by removing splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from walls, floors, and metal surfaces before surfaces are marred.
   2. Prohibit overloading of trucks to prevent spillages on access and haul routes. Provide periodic inspection of traffic areas to enforce requirements.
   3. Final cleanup is specified in SECTION 017800 - CONTRACT CLOSEOUT.

E. Pollution Control:
   1. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of hazardous or toxic substances from construction operations.
   2. Provide equipment and personnel, perform emergency measures required to contain any spillages, and remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-Site in approved locations, and replace with suitable compacted fill and topsoil.
   3. Take special measures to prevent harmful substances from entering public waters, sanitary, or storm sewers.

3.04 ACCESS ROADS AND PARKING AREAS:

A. Existing On-Site Roads and Parking Areas:
   1. Designated existing on-Site streets and parking facilities may be used for construction traffic. These areas are located on the Green Station Outage Lay Down Map.
      a. Provide temporary additional roads as needed for required construction access.
      b. Maintain existing construction, and restore to original, better, or specified condition at completion of Work.
      c. Do not allow heavy vehicles or construction equipment in parking areas.

3.05 TRAFFIC CONTROL AND USE OF ROADWAYS:

A. Traffic Control:

1. Provide, operate, and maintain equipment, services, and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow on haul routes, at Site entrances, on-Site access roads, and parking areas. This includes traffic signals and signs, flagmen, flares, lights, barricades, and other devices or personnel as necessary to adequately protect the public.
2. Remove temporary equipment and facilities when no longer required. Restore grounds to original, better, or specified condition when no longer required.
3. Provide and maintain suitable detours or other temporary expedients if necessary.
4. Bridge over open trenches where necessary to maintain traffic.
5. Consult with governing authorities to establish public thoroughfares which will be used as haul routes and Site access. All operations shall meet the approval of owners or agencies having jurisdiction.

B. Maintenance of Roadways:
   1. Repair roads, walkways, and other traffic areas damaged by operations. Keep traffic areas as free as possible of excavated materials and maintain in a manner to eliminate dust, mud, and hazardous conditions.
   2. All operations and repairs shall meet the approval of owners or agencies having jurisdiction.

END OF SECTION 015700

SECTION 016000 - EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements governing Contractor's selection of products for use in the Project.
   1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. For the applicability of industry standards to products specified: DIVISIONS 3 through 33.
   2. For submittal of Contractor's construction progress schedule and the Submittal schedule: SECTIONS 013200 and 013300.
   3. For handling requests for substitutions made after award of the Contract: SECTION 012500.

1.02 DEFINITIONS:

A. Definitions used in this Article are not intended to change the meaning of other terms used in these Contract Documents, such as "specialties," "systems," "structures," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
   1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "Material," "Equipment," "system," and terms of similar intent.
      a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature that is current as of the date of the Contract Documents.
      b. "Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50% or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50%) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
   2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
   3. "Equipment" is a product with operational or nonoperational parts, whether motorized, or manually operated, that may require service connections, such as wiring or piping.

1.03 QUALITY ASSURANCE:

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
   1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete Project requirements in a timely manner, consult with Engineer to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
   1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.
   2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, Engineer will determine which products shall be retained and which are incompatible and must be replaced.

1.04 TRANSPORTATION AND SHIPMENT:

A. Shipment Preparation:
   1. Contractor shall require manufacturers and Suppliers to prepare products for shipment in a manner to facilitate unloading and handling, and to protect against damage, deterioration, or unnecessary exposure to the elements in transit and storage. Provisions for protection shall include the following:
      a. Crates or other suitable packaging materials.
      b. Covers and other means to prevent corrosion, moisture damage, mechanical injury, and accumulation of dirt in motors, electrical equipment, and machinery.
      c. Suitable rust-preventive compound on exposed machined surfaces and unpainted iron and steel.
      d. Grease packing or oil lubrication in all bearings and similar items.

B. Marking: Each product item shall be tagged or marked as identified in the delivery schedule or on Submittals. Complete packing lists and bills of material shall be included with each shipment. Each piece of every item need not be marked separately, provided that all pieces of each item are packed or bundled together and the packages or bundles are properly tagged or marked.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
   1. Schedule delivery to minimize long-term storage at the Site and to prevent overcrowding of construction spaces. Allow ample time to avoid delay of the Work.
   2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
   3. Deliver products to the Site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected. Inspect shipment to assure:
      a. Product complies with requirements of Contract Documents and reviewed Submittals.
      b. Quantities are correct.
      c. Containers and packages are intact and labels are legible.
      d. Products are properly protected and undamaged.
   5. Store products at the Site in a manner that will facilitate inspection and measurement of quantity or counting of units. Mark deliveries of component parts of Equipment to

identify the Equipment, to permit easy accumulation of parts, and to facilitate inspection and measurement of quantity or counting of units.

6. Store heavy Materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, and with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
8. Protect exposed machined surfaces and unpainted iron and steel as necessary with suitable rust-preventive compounds.
9. Handle and store steel plate, sheet metal, and similar items in a manner to prevent deformation.

B. Handling:
1. Provide equipment and personnel necessary to unload and handle products, by methods to prevent damage or soiling to products, or packaging.
2. Handle by methods to prevent bending or overstressing. Where lifting points are designated, lift components only at those points.
3. Provide additional protection to surrounding surfaces as necessary to prevent damage.

C. Maintenance of Storage:
1. Inspect stored products on a scheduled basis.
2. Verify that storage facilities comply with manufacturer's product storage requirements, including environmental conditions continually maintained.
3. Verify that surfaces of products exposed to elements are not adversely affected; that any weathering of finishes is acceptable under requirements of Contract Documents.

D. Protection After Installation: Provide substantial coverings as necessary to protect installed products from damage from subsequent construction operations. Remove coverings when no longer needed or as specified.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION:

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise specified or indicated, new at the time of installation.
1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
2. Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Conform to applicable Specifications, codes, standards, and regulatory agencies.
4. Comply with size, make, type, and quality specified, or as specifically approved in writing by Engineer.
5. Manufactured and Fabricated Products:
   a. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
   b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
   c. Equipment and Materials shall be suitable for service conditions intended.
   d. Equipment capacities, sizes, and dimensions indicated or specified shall be adhered to unless variations are specifically approved in writing by Engineer.
6. Do not use products for any purpose other than that for which designed.

7. To the fullest extent possible, provide products of the same kind from a single source.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS:

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place except as required for proper movement and performance, and accurately located and aligned with other Work.
   1. Obtain and distribute copies of manufacturer's printed instructions and recommendations if not a part of Submittals, containers, or packaging to parties involved in the installation, including a copy to Engineer.
   2. Maintain one complete set of instructions at the Site during installation and until completion.
   3. Handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformance with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.

B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 016000

SECTION 017800 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Instruction book and operating manual submittal.
   4. Submittal of warranties.
   5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections of the Specifications.

C. Related Work Specified Elsewhere:
   1. Prerequisites for Substantial Completion and Final Acceptance: See Commercial Documents.
   2. Submittals: SECTION 013300.

1.02 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100% completion for the portion of the Work claimed as Substantially Complete.
      a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.
      b. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete Work, and reasons the Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship Bonds, maintenance agreements, final certifications, and similar documents.
   4. Obtain and submit releases enabling Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Submit record drawings, instruction books and operating manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
   6. Deliver tools, spare parts, extra stock, and similar items.
   7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions.
   8. Complete start-up testing of systems and instruction of Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the Site, along with mockups, construction tools, and similar elements.
   9. Complete final cleanup requirements, including touchup painting.
   10. Touch up and otherwise repair and restore marred, exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare the

Certificate of Substantial Completion following inspection or advise Contractor of construction that must be completed or corrected before the certificate will be issued.

1. Engineer will repeat inspection when requested and assured by Contractor that the Work is Substantially Complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.03 FINAL ACCEPTANCE:

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
   1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
   2. Submit an updated final statement, accounting for final additional changes to the Contract Price.
   3. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by Engineer.
   4. Submit consent of surety to final payment.
   5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   6. Submit a final liquidated damages settlement statement.

B. Reinspection Procedure: Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Engineer.
   1. Upon completion of reinspection, Engineer will prepare a certificate of final acceptance. If the Work is incomplete, Engineer will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
   2. If necessary, reinspection will be repeated.

1.04 RECORD DOCUMENT SUBMITTALS:

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for Engineer's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Record information concurrently with construction progress.
   2. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Mark each document "PROJECT RECORD" in neat, large, printed letters.
   3. Mark new information that is important to Owner but was not shown on Contract Drawings or Shop Drawings.
   4. Note related Change Order numbers where applicable.

5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
6. Upon completion of the Work, submit record drawings to Engineer for Owner's records.
7. Include the following:
    a. Depths of various elements of foundation in relation to finish first floor datum.
    b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
    c. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.
    d. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
    e. Field changes of dimension and detail.
    f. Changes made by Change Order or other Modifications.
    g. Details not on original Contract Drawings.

C. Record Specifications: Maintain one complete copy of the Project Manual including Addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction.
1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
3. Note related record drawing information and product data.
4. Upon completion of the Work, submit record Specifications to Engineer for Owner's records.
5. Include the following:
    a. Manufacturer, trade name, catalog number, and Supplier of each product and item of Equipment actually installed, particularly optional and substitute items.
    b. Changes made by Addendum, Change Order, or other Modifications.
    c. Related Submittals.

D. Record Product Data: Maintain one copy of each product data Submittal. Note related Change Orders and markup of record drawings and specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
3. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.

E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records, and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Engineer for Owner's records.

F. Electronic Documentation:
1. In addition to paper copies, provide electronic versions of record documents showing "as-constructed" conditions, "as-constructed" construction progress schedule, master field drawing list showing final revisions on CD-ROM in the latest release of AutoCAD.

G. Warranties and Bonds: As specified in the contract documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 FINAL CLEANING:

A. General: Contractor shall keep the Site premises free from accumulations of waste materials, rubbish, and other debris resulting from the Work. Regular Site cleaning is included in SECTION 015700.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
    a. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Clean concrete floors to a "broom clean" condition. Vacuum carpeted surfaces.
    b. Remove debris and surface dirt from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
    c. Clean the Site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.
2. Remove temporary structures, tools, equipment, supplies, and surplus materials.
3. Remove temporary protection devices and facilities which were installed to protect previously completed Work.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the Site and dispose of lawfully.

1. Extra materials of value remaining after completion of associated Work become Owner's property. Dispose of these materials as directed by Owner.

E. Repairs:

1. Repair damaged protective coated surfaces.
2. Repair roads, walks, fences, and other items damaged or deteriorated because of construction operations.
3. Restore all ground areas affected by construction operations.

END OF SECTION 017800

DIVISION 3 - CONCRETE

SECTION 031000 - CONCRETE FORMWORK

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes formwork for cast-in-place concrete.

B. Related Work Specified Elsewhere:

1. Concrete Reinforcement: SECTION 032000.
2. Concrete: SECTION 033000.

1.02 REFERENCES:

A. Applicable Standards:

1. American Concrete Institute (ACI):
   a. 117 - Specifications for Tolerances for Concrete Construction and Materials.
   b. 301 - Specifications for Structural Concrete.
   c. 318 - Building Code Requirements for Reinforced Concrete.
   d. 347 - Guide to Formwork for Concrete.
2. American Society for Testing and Materials (ASTM):
   a. C31 - Making and Curing Concrete Test Specimens in the Field.
   b. C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   c. C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

PART 2 - PRODUCTS

2.01 MATERIALS FOR FACING:

A. Where concrete will be exposed to view after construction:

1. Use exterior grade plywood at least 5/8-inch thick or steel forms capable of producing a smooth, uniform appearance.
2. Do not use form-facing materials with raised grain, torn surfaces, worn edges, dents, or other defects that will impair the texture of concrete surfaces.

B. Where concrete will not be exposed to view after construction:

1. Exterior grade plywood at least 5/8-inch thick.
2. Steel.
3. Wood fiberboard.
4. Dressed lumber free of loose knots.

C. Treat forms with commercially available form releasing agents that will not bond with, stain, or adversely affect concrete surfaces. Agents shall not impair subsequent treatment of concrete surfaces depending upon bond or adhesion, nor shall it impede the wetting of surfaces to be cured with water or curing compounds. Form releasing agents shall be VOC compliant with a maximum VOC content of 3.8 lbs/gal (450 g/L), or less where area restrictions are more stringent.

D. Clean forms of sawdust, dust, dirt, and other foreign materials.

2.02 FORM TIES:

A. Break-back, coil, or screw-type, except where otherwise specified.

B. Use water-seal coil type in walls below grade and in walls of water-bearing structures. Removable through-wall tappered ties shall not be used.

C. Coil type shall leave conical depression in concrete.
D. Space as required against pressure of fresh concrete.
E. The portion of the form tie remaining in place shall provide for a clearance of two times the minimum dimension of the tie, but not less than 3/4-inch, from the formed surface.

2.03 CHAMFER STRIPS:
A. Chamfer: 3/4-inch except where otherwise indicated.
B. Place in all forms to provide chamfer where concrete will have exposed projecting corners.

PART 3 - EXECUTION

3.01 FORM CONSTRUCTION:
A. Conform to ACI 301, 318, and 347, except Shop Drawings for formwork, shoring, and reshoring shall not be submitted for approval.
B. Adequately brace, stiffen, and support forms to prevent perceptible deflection or settlement, and to hold plumb, level, and true to line.
C. Construct and maintain forms to the tolerances given in ACI 117.
D. Construct sufficiently tight to prevent mortar leakage.
E. Avoid offsets between adjacent forms and construct so that shores, braces, and stiffening members are in line with those below.
F. Space studs and stringers as required to support facing against concrete pressure, but not more than 12 inches for 5/8-inch plywood or 16 inches for 3/4-inch plywood. Maximum deflection of facing materials reflected on concrete surfaces exposed to view shall be 1/240 of the span between structural members of the formwork.
G. Use wales, strongbacks, shores, and bracing as required.
H. Form all necessary openings or chases for piping, ductwork, and similar items where indicated or as required for the Work.
I. Construct forms to be removable in sections without marring concrete surface.
J. Surface of forms shall provide a smooth, dense, plane surface to finished concrete where exposed to view.
K. Contractor shall be responsible for structural adequacy, design, engineering, and construction of the formwork.
L. Stay-in-place metal forms shall not be used.

3.02 TIME-IN-PLACE FOR FORMS:
A. It is the responsibility of Contractor to consider all applicable factors and leave the formwork in place until it is safe to remove them.
B. All removal shall be performed in a manner which will prevent damage to the concrete and ensure the complete safety of the structure.
C. Where forms support more than one element, the forms shall not be removed until the form removal criteria are met by all supported elements.
D. Evidence that concrete has gained sufficient strength to permit removal of forms shall be determined by tests on control cylinders. All control cylinders shall be stored in the structure or as near the structure as possible so they receive the same curing conditions and protection methods as given those portions of the structure they represent. Control cylinders shall be removed from the molds at an age of no more than 24 hours. All control cylinders shall be prepared and tested in accordance with ASTM C31 and ASTM C39 at the expense of Contractor by an independent laboratory that complies with ASTM C107. Control cylinders shall be tested within 4 hours after removal from the Site.

E. Forms shall not be removed unless the minimum time or minimum compressive strength requirements below are met.
   1. Formwork Not Supporting Weight of Concrete:
      a. Formwork for walls, columns, sides of beams, gravity structures, slabs-on-ground and other vertical type formwork not supporting the weight of concrete shall remain in place 24-hours minimum after concrete placement is completed.
   2. Formwork Supporting Weight of Concrete:
      a. Formwork supporting weight of concrete and shoring shall not be removed until structural members have acquired sufficient strength to safely support their own weight and any construction or other superimposed loads to which the supported concrete may be subjected. As a minimum, no forms or shoring shall be loosened or removed until control concrete test cylinders indicate the concrete has attained the following compressive strengths for the respective structural members:

Structural Member	Percent of Design Compressive Strength
Unshored slab and beam forms or forms which can be removed without disturbing shores.....	70
Slab or beam shoring	85

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes steel reinforcement bars, ties, welded wire fabric, bolsters, chair supports, and accessories.

B. Related Work Specified Elsewhere:
   1. Concrete Formwork: SECTION 031000.
   2. Concrete: SECTION 033000.

1.02 REFERENCES:

A. Applicable Standards:
   1. American Society for Testing and Materials (ASTM):
      a. A82 - Steel Wire, Plain, for Concrete Reinforcement.
      b. A185 - Steel Welded Wire Reinforcement, Plain, for Concrete.
      c. A615/A615M - Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
      d. A706/A706M - Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
   2. American Concrete Institute (ACI):
      a. 301 - Specifications for Structural Concrete.
      b. SP-66 - Detailing Manual.
      c. 318 - Building Code Requirements for Structural Concrete.
      d. 117 - Specifications for Tolerances for Concrete Construction and Materials.
   3. American Welding Society (AWS):
      a. A5.5 - Low Alloy Steel Electrodes for Shielded Metal Arc Welding.
      b. B2.1 - Welding Procedure and Performance Qualification.
      c. D1.4 - Structural Welding Code - Reinforcing Steel.
   4. Concrete Reinforcing Steel Institute (CRSI):
      a. Manual of Standard Practice.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Include, but not limited to, the following:
   1. Complete bar schedule, bar details, and erection drawings to conform to ACI SP-66.
   2. Drawing with each type of bent bar marked with identification mark. Straight bars shall have mark number or be identified by size and length.
   3. Erection drawings shall be clear, easily legible, and to a minimum scale of:
      a. 1/4 inch = 1 foot (1:50).
      b. 1/8 inch = 1 foot (1:100) if bars in each face are shown in separate views.
   4. Size and location of all openings.
   5. Concrete protective cover.
   6. Grade of steel.
   7. Lap splice lengths.

1.04 DELIVERY, STORAGE, AND HANDLING:

A. Store steel reinforcement blocked-up off the ground and in orderly stacks.

B. Store only bars with the same identifying label in the same stack.

1.05 TESTING:

A. Perform at the mill for each heat.
B. Submit certified test results upon request.

PART 2 - PRODUCTS

2.01 REINFORCEMENT BARS, TIES, AND STIRRUPS:

A. Materials:
   1. Conform to ASTM A615, Grade 60, except as otherwise specified.
   2. Cold-drawn wire for spiral column ties shall conform to ASTM A82.
   3. Reinforcement indicated or specified to be welded shall conform to ASTM A706.
B. Fabrication of Bars:
   1. Fabricate with cold bends conforming to the recommended dimensions shown in ACI 318.
   2. Fabricate bars according to the tolerances given in ACI 117.
   3. Field fabrication will be allowed only if Contractor has equipment to properly fabricate steel.
   4. Attach metal or plastic tags with identifying mark or length corresponding to mark number or length on Drawing. Straight bars shall have mark number or size and length. Bent bars shall have mark number.
   5. Contractor may, at his option, continue steel reinforcement through openings in walls and slabs, then field-cut the opening so that there will be the required concrete cover between ends of bars and edge of opening.

2.02 BOLSTERS, CHAIRS, AND ACCESSORIES:

A. Conform to ACI SP-66 and the CRSI Manual of Standard Practice.
B. Provide all spacers, bolsters, chairs, ties, and other devices necessary to properly space, place, support, and fasten steel reinforcement in place during the concrete placement.
C. Metal accessories shall be galvanized or plastic-coated where legs will be exposed in finished concrete surfaces.
D. Do not use rocks, broken bricks, wood blocks, or concrete fragments for support of steel reinforcement.

2.03 PRECAST CONCRETE BLOCK BAR SUPPORTS:

A. May be used only for bar supports in slabs on ground.
B. Conform to ACI SP-66 and the CRSI Manual of Standard Practice.
C. Each block shall have a minimum of 9 square inches (5800 square millimeters) of bearing area. Space as required by the particular condition of weight, bearing surface, and rigidity of the steel reinforcement.

PART 3 - EXECUTION

3.01 PLACEMENT OF STEEL REINFORCEMENT:

A. Place all steel reinforcement before concrete is cast in accordance with approved erection drawings, ACI 117, Chapters 7 and 12 of ACI 318, and the CRSI Manual of Standard Practice.
B. Remove oil, mill scale, pitting, mud, loose rust, ice, and other materials that would reduce bond from bars before placing.
C. Tie securely with 1.6 mm (16-gage) or larger annealed iron wire.

D. Place to maintain concrete cover to conform to ACI 117 and Chapter 7 of ACI 318, unless otherwise indicated.
E. Splice steel where indicated. Splices shall be in full contact and shall conform to Chapter 12 of ACI 318.
    1. Unless otherwise indicated, lap splices shall be Class B as defined by ACI 318.
    2. Splice steel using Cadweld Series T-splices where indicated or approved.
        a. Provide a manufacturer's representative to give on-site instructions to all welders who will perform the splices in the field.
        b. Contractor shall have the manufacturer's representative instruct, observe, and approve in writing those persons doing the welding.
        c. Contractor shall arrange for the manufacturer's representative to return at the request of the Engineer.
    3. Any additional Contractor-proposed splice shall be submitted for acceptance of location and splice length.
F. Lap welded wire reinforcement in accordance with Section 12.19 of ACI 318, but not less than the length of one mesh plus 2 inches (50 mm).
G. Connection of reinforcement bars to steel shapes or plate shall be with a Cadweld Series B-splice.
H. Do not bend bars embedded in hardened or partially hardened concrete without approval from Engineer. If bending is permitted, conform to procedures of ACI 301 unless otherwise prescribed by the governing building code.
I. Do not weld reinforcing bars unless specifically indicated. Where welding is indicated, provide bars conforming to ASTM A706/A706M and comply with AWS D1.4.

END OF SECTION 032000

SECTION 033000 - CONCRETE

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes concrete and related items.

B. Related Work Specified Elsewhere:

1. Concrete Formwork: SECTION 031000.
2. Concrete Reinforcement: SECTION 032000.
3. Embedded Steel: SECTION 051200.

1.02 REFERENCES:

A. Comply with the provisions of the following codes, specifications, and standards, except as otherwise indicated.

1. American Concrete Institute (ACI):
   a. 301 - Specifications for Structural Concrete.
   b. 318 - Building Code Requirements for Structural Concrete.

B. Applicable Standards Where Referenced Herein:

1. American Society for Testing and Materials (ASTM):
   a. A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
   b. B370 - Copper Sheet and Strip for Building Construction.
   c. C31/C31M - Practice for Making and Curing Concrete Test Specimens in the Field.
   d. C33 - Concrete Aggregates.
   e. C39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   f. C40 - Test Method for Organic Impurities in Fine Aggregates for Concrete.
   g. C42 - Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
   h. C78 - Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
   i. C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
   j. C94 - Ready-Mixed Concrete.
   k. C114 - Test Methods for Chemical Analysis of Hydraulic Cement.
   l. C117 - Test Method for Material Finer than 75μ (No. 200) Sieve in Mineral Aggregates by Washing.
   m. C136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   n. C142 - Test Method for Clay Lumps and Friable Particles in Aggregates.
   o. C143 - Test Method for Slump of Hydraulic Cement Concrete.
   p. C150 - Portland Cement.
   q. C172 - Practice for Sampling Freshly Mixed Concrete.
   r. C192/C192M - Practice for Making and Curing Concrete Test Specimens in the Laboratory.
   s. C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   t. C233 - Test Methods for Air-Entraining Admixtures for Concrete.
   u. C260 - Air-Entraining Admixtures for Concrete.
   v. C289 - Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
   w. C295 - Guide for Petrographic Examination of Aggregates for Concrete.
   x. C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
   y. C430 - Test Method for Fineness of Hydraulic Cement by the 45μ (No. 325) Sieve.

z. C494 - Chemical Admixtures for Concrete.
aa. C566 - Test Method for Total Evaporable Moisture Content of Aggregate by Drying.
bb. C595/C595M - Blended Hydraulic Cements.
cc. C618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
dd. C881 - Epoxy-Resin-Base Bonding Systems for Concrete.
ee. C1107 - Packaged Dry, Hydraulic Cement Grout (Nonshrink).
ff. C1193 - Guide for Use of Joint Sealants.
gg. C1315 - Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
hh. D1751 - Preformed Expansion Joint Filler for Concrete Paving and Structural Construction. (Nonextruding and Resilient Bituminous Types).
ii. D1752 - Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
jj. D2240 - Test Method for Rubber Property - Durometer Hardness.
kk. E1155/E1155M - Test Method for Determining F_F Floor Flatness and F_L Floor Levelness Numbers.

2. American Concrete Institute (ACI):
   a. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
   b. 302.1R - Guide for Concrete Floor and Slab Construction.
   c. 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
   d. 305R - Committee Report on Hot Weather Concreting.
   e. 306R - Committee Report on Cold Weather Concreting.
   f. 308.1 - Standard Specification for Curing Concrete.
   g. 309R - Guide for Consolidation of Concrete.
3. Concrete Plant Manufacturers Bureau (CPMB):
   a. 100 - Concrete Plant Standards.
   b. 102 - Recommended Guide Specifications for Batching Equipment and Control Systems in Concrete Batch Plants.
   c. Plant Mixer Manufacturers Division (PMMD) 100 - Concrete Plant Mixer Standards.
4. Federal Specification (FS):
   a. SS-S-200 - Sealants, Joint: Two-Component, Jet-Blast-Resistant, Cold-Applied, for Portland Cement Concrete Pavement.
   b. TT-S-227 - Sealing Compound: Elastomeric Type, Multi-Component (for Calking, Sealing, and Glazing in Buildings and Other Structures).
5. National Bureau of Standards (NBS) Specifications for Scales.
6. Truck Mixer Manufacturers Bureau (TMMB):
   a. Truck Mixer, Agitator and Front Discharge Concrete Carrier Standards.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.
B. Include, but not limited to, product data and Shop Drawings of the following:
   1. Nonshrink grouts.
   2. Admixtures.
   3. Bonding agents.
   4. Curing agents.
   5. Expansion joint materials.

6. Joint sealants.
7. Waterstops.

C. Mill Certificates:
1. Submit to Engineer a minimum of one copy for each cement shipment.

D. Concrete Mix Design Proportions:
1. Submit as specified in PART 2, paragraph 2.01D - Mix Proportions, this Section.
2. Submit for each mix design, including aggregate gradation data.
3. Resubmit for any change in each mix design.

E. Production Test Reports: Submit as specified in DIVISION 1 and PART 2, paragraph 2.01E - Measurement of Materials, this Section

1.04 QUALITY ASSURANCE:

A. Field Testing: Shall be performed by an ACI Concrete Field Testing Technician Grade 1.

B. Submit qualification records of field testing and finishing technicians prior to placing concrete.

PART 2 - PRODUCTS

2.01 CONCRETE:

A. Materials:
1. Portland cement Type II. Type II shall conform to ASTM C150.
a. Fly ash shall be used as the pozzolan and be interground with the clinker in the manufacture of the cement. Fly ash shall conform to ASTM C618, Class F.
(1) Fly ash may be added by Supplier as a separate ingredient provided the Supplier has scales for dispensing fly ash that meet the requirements of Paragraph 2.01.E, this Part.
b. The maximum amount retained on the No. 325 sieve shall be 10% as determined in accordance with ASTM C430.
c. The maximum amount of alkalies ($NA_2O + 0.658\ K_2O$) shall be 0.60% determined in accordance with ASTM C114. A running average of three Samples shall not exceed a maximum of 0.50%.
d. Use one brand of cement throughout the Project unless otherwise approved by Engineer.
2. Fine Aggregate:
a. Conform to ASTM C33.
b. Approved service record of 3 years with a history indicating that the fine aggregate is not chemically reactive.
c. For a new fine aggregate source, or when 3 years' approved service records are not available, or when the service records are unacceptable; the aggregate shall be evaluated for potential reactivity. Aggregate must be considered innocuous in accordance with petrographic examination by ASTM C295 and tests conforming to ASTM C289.
d. Fine aggregate considered deleterious or potentially deleterious shall not be used without approval.
e. Maintain fine aggregate free of ice and frozen lumps.
f. Fineness modulus shall be between 2.3 and 3.1.
3. Coarse Aggregate:
a. Conform to ASTM C33.
(1) Limits for deleterious substances and physical property requirements shall conform to Table 3 and applicable class designation 5S, 5M, or 1N.

b. Approved service record of 3 years with a history indicating that the coarse aggregate is not chemically reactive.
c. For a new coarse-aggregate source, when 3 years' approved service records are not available, or when the service records are unacceptable; the aggregate shall be evaluated for potential reactivity. Aggregate must be considered innocuous in accordance with petrographic examination by ASTM C295 and tests conforming to ASTM C289.
d. Coarse aggregate considered deleterious or potentially deleterious shall not be used without approval.
e. Blast furnace slag will not be permitted.
f. Maintain coarse aggregate free of ice and frozen lumps.
g. Grading Requirements:
(1) Size No. 67, from 3/4-inch (19 mm) to No. 4 (4.75 mm) sieve for all concrete unless otherwise specified.

4. Mixing Water:
a. Only potable water will be acceptable.
5. Admixtures:
a. Water-Reducing Type:
(1) Conform to ASTM C494, Type A.
(2) Conform to manufacturer's recommendations for use.
(3) Technical assistance of the manufacturer's field representative shall be furnished upon request.
b. Air-Entraining Type:
(1) Conform to ASTM C260.
(2) Conform to manufacturer's recommendations for use.
(3) Technical assistance of the manufacturer's field representative shall be furnished upon request.
(4) Testing of air-entraining admixtures shall conform to ASTM C233.
c. Other Admixtures: Use only with Engineer's written concurrence.
(1) Water-Reducing, Retarding Type: Conform to ASTM C494, Type D.
(2) High Range Water Reducers: Conform to Type ASTM C494, Type F.
(3) Conform to manufacturer's recommendations for use.
(4) Technical assistance of the manufacturer's field representative shall be furnished upon request.
d. Admixtures shall not contain any chloride ions.
e. Storage: Admixtures shall be stored in such a manner as to avoid contamination, evaporation, freezing, temperature changes, settling, or any damage which would adversely affect their characteristics.

B. Laboratory Testing of Materials for Use in Concrete:
1. An approved independent testing laboratory shall be selected and paid by Contractor to perform all required laboratory tests of materials proposed for use in the production of concrete and to determine mix proportions when laboratory trial batches are required.
2. Contractor shall deliver representative Samples of all proposed concrete materials to the laboratory for the following testing:
a. Fine Aggregate:
(1) ASTM C33.
(2) ASTM C40.
(3) ASTM C88.
(4) ASTM C117.

(5) ASTM C136.
(6) ASTM C142.
(7) Fineness modulus.
(8) ASTM C295 and ASTM C289 or approved service records.

b. Coarse Aggregate:
(1) ASTM C33.
(2) ASTM C88.
(3) ASTM C136.
(4) ASTM C142.
(5) ASTM C295 and ASTM C289 or approved service records.

c. Air-entraining admixture shall be tested conforming to ASTM C233.

3. The laboratory test results shall be part of the design mix submittal specified in this PART 2, paragraph 2.01D. - Mix Proportions.

C. Concrete Qualities Required:
1. Compressive Strength:
a. Minimum 28-day compressive strength = 4,000 psi for all construction unless otherwise indicated.
b. Minimum 28-day compressive strength = 2,000 psi for fill concrete and seal coats.
c. Compressive-strength determinations shall be made from 6-inch diameter x 12-inch long concrete cylinders tested in accordance with ASTM C39.
2. Slump of concrete shall be between 2 inches and 4 inches as tested in accordance with ASTM C143.
3. Air Content:
a. 6% $\pm$ 1.5% unless otherwise indicated or specified.
b. Testing shall be in accordance with ASTM C231.
4. Water-Cement Ratio:
a. In addition to the aforementioned requirements, water-cement ratios shall be limited as follows:
(1) 0.45 for all concrete unless otherwise specified.

D. Mix Proportions:
1. Concrete shall be homogeneous, readily placeable, uniformly workable, and finishable; proportioned to conform to ACI 211.1.
2. Mix proportions for all concrete, unless otherwise specified, shall be selected preferably on the basis of field experience; but in the case where sufficient or suitable strength test data is not available, concrete shall be proportioned on the basis of laboratory trial mix design.
a. Field experience using test results within the preceding year, with the materials and plant to be employed may be the basis of mix proportioning, provided that not less than 30 consecutive satisfactory compressive-strength tests on concrete using the proposed materials with a similar mix are available. A compressive-strength test is defined as the average 28-day compressive strength of two companion cylinders made conforming to ASTM C172 and ASTM C31 and tested conforming to ASTM C39.
(1) The standard deviation of compressive-strength tests shall be computed as a basis for design of the mix. The design average compressive strength shall exceed the specified strength by at least:
(a) 400 psi if standard deviation is less than 300 psi.
(b) 550 psi if standard deviation is 300 to 400 psi.
(c) 700 psi if standard deviation is 400 to 500 psi.

(d) 900 psi if standard deviation is 500 to 600 psi.
(e) 1,200 psi if standard deviation is greater than 600 psi.

(2) Submit the following test data to Engineer for approval prior to placing concrete:
(a) Fine Aggregate:
1) ASTM C33.
2) ASTM C40.
3) ASTM C88.
4) ASTM C117.
5) ASTM C136.
6) ASTM C142.
7) Fineness modulus.
8) ASTM C295 and ASTM C289 or approved service records.
(b) Coarse Aggregate:
1) ASTM C33.
2) ASTM C88.
3) ASTM C136.
4) ASTM C142.
5) ASTM C295 and ASTM C289 or approved service records.
(c) Cement:
1) Mill certificate.
2) ASTM C430.
(d) Concrete:
1) Fine and coarse aggregate, water and cement sources.
2) Mix proportions, slump and air content.
3) Data on 30 consecutive satisfactory compressive strength tests and standard deviation calculations.

b. Laboratory Trial Batch: When laboratory trial batches are used as a basis for determining mix proportions, all such Work shall be performed by the laboratory as specified in PART 2, paragraph 2.01B. - Laboratory Testing of Materials for Use in Concrete, this Section.
(1) Laboratory trial batches shall be used to establish a water-cement ratio, compression-strength curve with at least three points, each representing the strength of a separate trial batch. At least one point shall be above and one below the strength required. Each point on the curve shall represent the average of at least three cylinders tested at 28 days or an earlier age when approved by Engineer. The slump and air content shall be at the maximum limits specified in PART 2, paragraph 2.01C. - Concrete Qualities Required, this Section.
(2) A point on the water-cement ratio, compressive-strength curve shall be selected that will provide an average compressive strength at least 1,200 psi greater than the specified minimum strength.
(3) Submit the following test data to Engineer for approval prior to placing concrete.
(a) Fine Aggregate:
1) ASTM C33.
2) ASTM C40.
3) ASTM C88.
4) ASTM C117.

5) ASTM C136.
6) ASTM C142.
7) Fineness modulus.
8) ASTM C295 and ASTM C289 or approved service records.

(b) Coarse Aggregate:
1) ASTM C33.
2) ASTM C88.
3) ASTM C136.
4) ASTM C142.
5) ASTM C295 and ASTM C289 or approved service records.

(c) Cement:
1) Mill certificate.
2) ASTM C430.

(d) Concrete:
1) Fine and coarse aggregate, water and cement sources.
2) Laboratory mix proportions, slump and air content.
3) Water-cement ratio, compressive-strength curve.

3. Prior to placing any concrete, the laboratory selected by Contractor shall report the results of the testing and mix designs to the following:
   a. Engineer, Kansas City Office (one copy).
   b. Resident Project Representative, Field Office (one copy).
   c. Contractor (copies as required).
   d. Concrete Supplier (copies as required).

E. Measurement of Materials:
1. General Requirements:
   a. Conform to ACI 304R.
   b. Beam or springless dial-type scale conforming with NBS - "Specifications for Scales."
   c. Volumetric measurement of water shall be performed with an approved automatic valve.
2. Concrete Plant Scale Accuracy and Calibration Frequency:
   a. The concrete plant scales shall be accurate to $\pm$0.4% of the capacity of the scale.
   b. The scales shall be calibrated at intervals as specified in PART 3, ARTICLE 3.09 - TESTING, this Section.
3. Individual Batch Accuracy:
   a. Cement: $\pm$1.0%.
   b. Water: $\pm$1.0% by volume or weight.
   c. Aggregates: $\pm$2.0%.
   d. Admixtures: $\pm$3.0% by volume or weight.
   e. Fly Ash: $\pm$1.0%.

F. Mixing and Delivery:
1. Conform to ACI 304R.
2. Cement temperature, when added to mix, shall not exceed 170°F.
3. Adjust the amount of mix water to compensate for the moisture content of the aggregates.
4. Concrete Plant:
   a. Conform to "Concrete Plant Mixer Standards" of the Plant Mixer Manufacturers Division, Concrete Plant Manufacturers Bureau, and "Concrete Plant Standards" of the Concrete Plant Manufacturers Bureau.

b. Charge with 5% to 10% of the mixing water both in advance and after the addition of aggregates and cement.
c. Charge with remaining water uniformly with the other materials.
d. Avoid charging in excess of manufacturer's rating.
e. Discharge mixed concrete completely prior to recharging.
f. Mixing Time:
   (1) Start immediately when all ingredients, except the last of the water, are in the mixer.
   (2) Minimum mixing time shall conform with mixer manufacturer's instructions, but not be less than the following:

Capacity of Mixer Cubic Yards	Minimum Time of Mixing
1 or less	1 minute
2	1 minute, 15 seconds
3	1 minute, 30 seconds
4	1 minute, 45 seconds
5	2 minutes
6	2 minutes, 15 seconds

Add 15 seconds' mixing time for each additional cubic yard of concrete.

5. Mixing of Concrete at Plant Off Jobsite:
   a. Mix concrete in central mixer or truck mixer. Transport in truck mixer turning at agitation speeds only.
   b. Water added to concrete having a slump below the specified minimum shall be at Contractor's risk. If the water added produces a slump greater than the specified maximum, the concrete will be rejected. If water is added, the concrete shall be remixed for a minimum of 25 revolutions. Water shall not be added after the truck mixer has begun to discharge concrete.
   c. Truck mixer shall conform to "Truck Mixer, Agitator, and Front Discharge Concrete Carrier Standards" of the Truck Mixer Manufacturers Bureau.
   d. Ready-mixed concrete shall be produced and delivered conforming to ASTM C94 as applicable.
   e. Contractor shall furnish Owner with a concrete delivery ticket for each load of concrete. The ticket shall have the following information recorded:
      (1) Serial number of ticket.
      (2) Time batched.
      (3) Time arrived on jobsite.
      (4) Amount of concrete (by volume).
      (5) Mix number.
      (6) Amount of all water added at jobsite by Contractor.
      (7) Name of ready-mix batch plant.
      (8) Date.
      (9) Truck number.
      (10) Name of purchaser.
6. Plant and truck mixer uniformity shall be tested according to ASTM C94. Frequency of tests shall be as specified in PART 3, this Section.

2.02 GROUT:

A. Grout for Dry Packing:
   1. Volume: 1 part portland cement to 2 parts sand.
   2. Keep water to a minimum as required for placing by the dry packing method.
   3. Place after the mixed grout has been allowed to stand for 2 hours.
   4. The sand and cement shall be as specified for concrete.

B. Flowable Nonshrinking Grout:
   1. Required for setting handrail posts, for setting equipment recommended by the manufacturer to be set with nonshrinking grout, and in other places indicated.
   2. Grout shall be nonmetallic and conform to ASTM C1107.
   3. Prepare and place conforming to manufacturer's printed instructions.
   4. For equipment bases, the concrete surfaces shall be grit blasted or roughened with a chipping hammer prior to grouting. The foundation plates shall be cleaned of any grease, oil, paint, primers, or epoxy coatings.

C. Grout for Bonding:
   1. Proportion (by weight): 1 part cement to 1-1/2 parts sand.
   2. Keep water to a minimum.

2.03 BONDING AGENT:

1. Provide moisture-insensitive, epoxy-resin bonding agent conforming to ASTM C881, Type V.

2.04 CONCRETE ACCESSORIES:

A. PVC Waterstops:
   1. 6-inch ribbed serrated virgin polyvinyl chloride equal to one of the following:
      a. Greenstreak, Inc. - Greenstreak Style 679.
      b. Vinylex Corporation - R6-38.
      c. Southern Metals - 17FR.
   2. Base Seal: Virgin polyvinyl chloride equal to one of the following:
      a. Nonexpansion Joints:
         (1) Greenstreak, Inc. - Greenstreak Style 771.
         (2) Vinylex Corporation - BS9-532.
      b. Expansion Joints:
         (1) Greenstreak, Inc. - Greenstreak Style 772.
         (2) Vinylex Corporation - BSE9-532.
   3. Provide factory fabricated waterstop corner transitions and intersections leaving only straight butt joint splices for the field.
   4. Waterstops shall be provided with factory-installed hog rings at 12-inch centers along each flange.
   5. Use for all locations unless otherwise specified.

B. Plastic Waterstops:
   1. Swellable, Chloroprene Rubber Waterstop:
      a. Greenstreak, Inc. - Hydrotite Product N. CJ-1020-2K-ADH.
      b. Adeka - Ultra Seal MC-2010MN.
   2. Swellable, Bentonite Waterstop:
      a. Greenstreak, Inc. - Swellstop Profile 594 (3/4" x 1").
      b. CETCO Building Materials - Volclay RX 101 (3/4" x 1").
   3. Non-swelling, Mastic/Asphaltic Waterstop:
      a. Greenstreak, Inc. - Lockstop.

b. Henry Company - Synko-Flex (SF302).

4. Provide all accessories as recommended by the manufacturer including, but not limited to, primers, adhesives, and sealants to ensure watertight construction. Install per manufacturer's written instructions and recommendations.

C. Expansion Joints:
1. Expansion Joint Filler: Preformed asphalt-impregnated fiber of thickness indicated and conforming to ASTM D1751. Use where indicated.
2. Bond Breaker: Polyethylene tape or other plastic tape as recommended by sealant manufacturer.
3. Sealant Backer Rod: Provide closed cell backer rod or other backing material as recommended by sealant manufacturer.
4. Joint Sealants:
a. Multi-component sealant as follows:
(1) Joint Sealant - General Use:
(a) BASF Building Systems: Sonneborn Sonolastic NP 2 (vertical use) and Sonolastic SL 2 (horizontal use).
(b) Epoxy Systems Products Company: Product #11.
(c) Euclid Chemical Company: Eucolastic II.
(d) Pecora Corporation: NR-200, Dynatred.

D. Preformed Contraction Joints: Zip Joint T-shaped plastic strip as manufactured by BoMetals, Inc., Powder Springs, Georgia. Depth of preformed construction joint shall exceed 1/4 of the slab thickness.

2.05 CURING AGENT:

A. Apply to all concrete surfaces unless otherwise indicated or specified.
B. Curing agent shall conform as follows:
1. ASTM C309, Type 1: Use where concrete surface is not exposed to direct sunlight after placement.
2. ASTM C309, Type 1-D: Use where slabs are exposed to direct sunlight for a period of seven days minimum after placement. Curing and sealing agent with fugitive dye shall be readily distinguishable upon the concrete surface for at least four hours after application but shall be inconspicuous within seven days after application.
3. ASTM C309, Type 2: Use as specified in PART 3, ARTICLE 3.05 - HOT WEATHER CONCRETING, this Section.
C. Curing compound shall be VOC compliant with a maximum VOC content of 2.9 lbs/gal (350 g/L), or less where Project location regulations are more stringent.

PART 3 - EXECUTION

3.01 PREPARATION FOR CONCRETE PLACEMENT:

A. Openings Through Concrete: Provide openings through concrete as indicated and for the proper installation of all equipment, piping, wiring, and similar items, installed under this Contract.
B. Installation of Embedded Items:
1. Provide for accurate installation of embedded items installed under this Contract.
2. Securely fix floor drains in place to prevent flotation while placing concrete. Uniformly and accurately slope finish floor slab toward the drains.
3. Embedded items shall be as indicated or specified, or as selected by Contractor and approved by Engineer.

4. During cold weather, protect pipe sleeves from moisture which may freeze, expand, and crack the sleeve and concrete structure.
5. Grease or tape anchor bolt threads to protect from concrete splatter.

C. Installation of Joints:
1. Construction Joints:
   a. Location:
      (1) Locate joints, which are not indicated or specified, in conformance with ACI 318.
      (2) Obtain Engineer's approval of joints located by Contractor prior to preparation of reinforcing steel drawings.
   b. Preparation and Installation:
      (1) Clean and break laitance or other foreign material from bonding surface.
      (2) Tighten forms remaining in place (where applicable) to prevent seepage between forms and hardened concrete.
      (3) Provide waterstops and shear keys as indicated or specified and as required in any new construction joint requested by Contractor.
   c. Waterstops:
      (1) Install in all construction joints where indicated.
      (2) Install conforming to manufacturer's printed instructions. All joints and splices of PVC waterstop shall be 100% fused. Use thermostatically controlled splicing iron as recommended by manufacturer.
      (3) Metal waterstops shall be welded with a continuous watertight weld or bolted with a minimum contact lap of 12 inches (300 mm).
2. Expansion Joints:
   a. Install filler, backer rod and sealant in strict conformance with manufacturer's written instructions.
   b. Reinforcing steel shall not extend through expansion joints unless indicated otherwise.
   c. Attach rigid joint filler to the face of the joint prior to placing adjacent concrete. The filler shall occupy the entire width of the joint.
   d. Install sealant backer rod for sealant except where indicated to be omitted. Install bond breaker where indicated.
   e. Clean joints surfaces immediately before application of sealant.
   f. Install joint sealants to conform to ASTM C1193. Tool sealants to provide smooth, uniform bead with a slightly concave surface, eliminate air pockets, and insure sealant contact and adhesion with sides of joint.
   g. Protect joints from moisture and ice during freezing.
3. Contraction Joints: As specified in this PART 3, ARTICLE 3.03 - FINISHING, this Section.

D. Cutting and Bonding to Existing Concrete:
1. Cutting Existing Concrete:
   a. Use methods and equipment that will avoid damage to adjacent parts of the structure from heavy blows or vibration.
   b. Cut existing concrete with power concrete saw where possible to prevent spalling and chipping and to form neat, straight edge.
   c. Remove all loose or cracked concrete resulting from cutting existing concrete, leaving only sound, undamaged concrete adjacent to new Work.
   d. Leave access opening edges with a neat, true grout surface to the opening size indicated.

e. Cut reinforcing steel with sufficient length remaining (approximately 38 bar diameters) for bending and lapping into new construction.

2. Bonding to Existing Concrete:
   a. Roughen concrete to 1/4-inch (6 mm) amplitude by use of a pneumatic chipping hammer or other approved means.
   b. Thoroughly clean the concrete surface and apply the bonding agent in accordance with manufacturer's written instructions.

3.02 PLACING OF CONCRETE:

A. Conventional Placing:
   1. General Requirements:
      a. Conform to ACI 304R.
      b. Bonding surfaces, including reinforcement, shall be clean, free of laitance and foreign materials.
      c. Face horizontal bonding surfaces with 1-inch (25-mm)-thick coat of fresh "grout for bonding." Wet all other surfaces.
      d. Place concrete on properly prepared and unfrozen subgrade and only in dewatered excavation and forms.
      e. Use forms for all concrete except where otherwise indicated or specified.
      f. Do not place concrete that has partially hardened or has been contaminated by foreign materials.
      g. Prevent mud or foreign materials from entering the concrete or forms during placement operations.
   2. Conveying:
      a. Convey concrete from the mixer and deposit in place by methods which will prevent the segregation or loss of materials.
      b. Equipment for chuting, pumping, and pneumatically conveying concrete shall be of such size and design as to provide a practically continuous flow of concrete at the delivery end.
      c. Aluminum conveying equipment shall not be used.
   3. Depositing:
      a. Place concrete in continuous horizontal lifts not to exceed 2 feet (600 mm), and place concrete against bulkheads and keyways at vertical joints.
      b. Maximum free drop of concrete and grout for bonding shall be 5 feet (1.5 meters), in walls 10 inches (250 mm) or less in thickness, with 1-foot (300 mm) additional drop allowed for each inch (25 mm) of wall thickness over 10 inches (250 mm), with a maximum drop of 10 feet (3 meters).
      c. When vapor barrier is used, keep lapped joints closed and take precautions to avoid puncturing the barrier.
   4. Consolidation of Concrete:
      a. Consolidate concrete in conformance with ACI 309R. Characteristics and application of concrete vibrators shall be as set forth in Table 5.1.5.
      b. Provide an adequate number of vibrators of sufficient capacity to keep up with the maximum rate of concrete placement. Keep on hand adequate standby equipment in good operating condition.
      c. Vibrate concrete only until the concrete is thoroughly consolidated and the voids filled, as evidenced by the leveled appearance of the concrete at the exposed surface and the embedment of the surface aggregate.

d. Insert internal vibrators vertically to the full depth of the layer being placed and into the previous layer. Do not drag vibrators through the concrete. Insert and withdraw vibrator slowly with the vibrator running continuously so that no hole will be left in the concrete. Do not flow concrete from one location to another by use of a vibrator.
e. Consolidate concrete layer to full depth when using a surface vibrator. Use thinner layers or a more powerful vibrator if necessary to achieve complete consolidation.
f. Use form vibrators only where sections are too thin or where sections are inaccessible for internal vibrators.

5. Time Requirements:
   a. Place concrete at a sufficient rate to assure that lifts below have not taken initial set before fresh concrete is deposited.
   b. Place concrete within 45 minutes after mixing. This period may be extended to 1 hour and 30 minutes provided that the combined air temperature, relative humidity, and wind velocity are such that the plasticity of the fresh concrete is satisfactory for placement and consolidation, and that the specified mixing water is not exceeded. Concrete which has partially set shall not be retempered but shall be discarded.

B. Placing Concrete at Joints:
   1. Bed horizontal joints with 1 inch (25 mm) of grout for bonding.
   2. Take precautions to ensure tight, well-bonded construction joints with no air pockets or voids.
   3. Take special precautions to avoid bending or displacing waterstop while placing concrete around it.
   4. Delay construction at a joint a minimum of 16 hours where placement is continued past joint, except where otherwise indicated.

3.03 FINISHING:

A. Unformed Surfaces:
   1. Screed Finish:
      a. Use as first stage for all concrete finishes.
      b. Use as final finish on surfaces that will be covered by additional concrete, grout placement, or mortar setting bed except as otherwise specified.
      c. Immediately after screeding, use a wood float, darby, or bullfloat to eliminate high and low spots and to embed large aggregate. This shall be done in a manner to produce even, uniform surfaces so that surface irregularities do not exceed 3/8 inch in 10 feet (9 mm in 3 meters) when used as final finish.
   2. Floated Finish:
      a. Use as second stage of broomed, troweled, or magnesium-troweled finish.
      b. Float with mechanical float. Hand floating will be permitted only in areas inaccessible to mechanical float.
      c. On surfaces not to receive troweled or magnesium-troweled finish, finish with wood or cork float after mechanical floating to a true uniform surface so that surface irregularities do not exceed 1/8 inch in 10 feet (3 mm in 3 meters), except at floor drains.
   3. Broomed Finish:
      a. Use as final finish on all outdoor slabs, mats, footing, and foundations.
      b. After floated finish, draw a stiff bristle broom across the surface making uniform corrugations, perpendicular to the direction of traffic, not more than 1/16 inch (1.6 mm) deep.

4. Contraction Joints:
   a. Locate as indicated.
   b. Maintain true alignment with straightedge.
   c. Grooved Joints:
      (1) Perform during the finishing process.
      (2) Width of groove shall not exceed 1/4-inch (6 mm).
      (3) Depth of groove shall be at least 1 inch (25 mm).
5. Floor Flatness and Levelness:
   a. Finish to a true uniform surface so that surface irregularities do not exceed 1/8 inch in 10 feet, except at floor drains.
   b. All slabs on grade not meeting the above minimum tolerance tests shall be removed and replaced at Contractor's expense.

B. Formed Surfaces:
1. Repair surface defects as specified in PART 3, paragraph 3.03C. - Repair of Defective Surfaces, this Section.

C. Repair of Defective Surfaces:
1. Defined as any concrete surface showing misalignment, rock pockets, poor joints, holes from ties, voids, honeycomb, or any other defective area.
2. Repairing:
   a. Repair as soon as forms have been removed.
   b. Chip surface back to minimum depth of 1/2 inch (13 mm), chip edges perpendicular to surface, prewet depression and brush with neat cement immediately before patching.
   c. Patch surfaces using stiff mortar with same sand-cement ratio as original concrete and with minimum water for placing. Blend with white cement to match concrete color.
   d. Compact mortar into depressions so that after curing, hole is filled and mortar is flush with surface. Use hammer and ramming rod for compacting the holes.
   e. Moist-cure for 3 days or use curing compound.
   f. Engineer shall be notified of areas containing defects or where reinforcing steel is exposed, prior to determination of repair method.

3.04 CURING:

A. Cure concrete by one of the following methods in accordance with ACI 308.1:
1. Keep formwork wet to prevent drying of concrete surfaces.
2. Using one coat of a liquid membrane forming compound as specified. Apply immediately after removal of forms (which have been continuously wet); or in case of a slab, after the concrete has been finished and is hardened sufficiently to walk on.
3. Curing of concrete during hot or cold weather shall conform to PART 3 - HOT WEATHER CONCRETING and COLD WEATHER CONCRETING, this Section.

3.05 HOT WEATHER CONCRETING:

A. Follow the recommendations of ACI 305R if any of the following conditions occur:
1. When the temperature is 90°F (32°C) or above.
2. When the temperature is likely to rise above 90°F (32°C) within the 24-hour period after concrete placement.
3. When there is any combination of high air temperature, low relative humidity, and wind velocity which would impair either concrete strength or quality.

B. Concrete shall have a maximum temperature of 85°F (29°C) during placement.

C. Dampen subgrade and forms with cool water immediately prior to placement of concrete.
D. Protect freshly placed concrete immediately after placement so that the rate of evaporation as determined by ACI 305R (Figure 2.1.5) does not exceed 0.2 pound per square foot (1.0 kg per square meter) per hour.
E. Protect concrete with suitable insulation if rapidly decreasing nighttime temperatures occur, which would cause thermal shock to concrete placed during warm daytime temperatures.
F. Protect the concrete with temporary wet covering during any appreciable delay between placement and finishing.
G. Begin curing unformed surfaces immediately after finishing and continue for 24 hours. Curing shall consist of application and maintenance of water-saturated material to all exposed surfaces; horizontal, vertical, and otherwise. After the 24-hour interval, continue curing using one of the following methods:
    1. Moist curing for 6 days.
    2. Application of one coat of curing compound as specified.
    3. Application and maintenance of curing paper or heat-reflecting plastic sheets for 6 more days.
H. Begin curing formed concrete immediately after placing. Curing shall consist of keeping forms continuously wet for 24 hours. Thereafter, continue curing using one of the following methods:
    1. Loosen forms and position soaker hose so that water runs down along concrete surfaces. Continue for 6 days.
    2. Strip forms and apply curing compound as specified. Do not allow concrete surfaces to dry prior to application of curing compound.

3.06 COLD WEATHER CONCRETING:

A. When the temperature is 40°F (4.4°C) or is likely to fall below 40°F (4.4°C) during the 24-hour period after concrete placement, follow the recommendations of ACI 306R to prevent loss of concrete strength or quality.
B. Minimum temperature for concrete as mixed shall be as indicated on lines 2, 3, and 4 of Table 3.1 of ACI 306R. Maximum temperature for concrete as mixed shall be 10°F (5.6°C) greater than the corresponding minimum temperature.
C. Place and maintain concrete so that its temperature is never less than the temperature indicated on line 1 of Table 3.1 of ACI 306R. Maintain the required temperature for the time duration indicated on Tables 5.1 and 5.3 of ACI 306R.
D. Monitor temperature of concrete in place at corners or edges of formwork as applicable.
E. Air Heaters:
    1. Do not expose concrete to carbon monoxide or carbon dioxide fumes from heaters or engines.
    2. Oil- or coke-burning salamanders will not be permitted.
    3. Heaters shall be ultramatic portable heaters made by the Union Chill Mat Company or Engineer approved equal.
    4. Personnel shall be present at all times to maintain safe, continuous operation of heating system.
F. Control temperature and humidity of protected concrete so that excessive drying of concrete surfaces does not occur.
G. Calcium chloride will not be permitted as a concrete accelerator or to thaw frozen subgrade prior to concrete placement.
H. The maximum allowable temperature drop during the first 24-hour period after protection is discontinued shall be as indicated on Table 5.5 of ACI 306R.

I. Cure the concrete in accordance with Chapter 5 of ACI 306R.

3.07 LOW-STRENGTH CONCRETE:

A. Low-Strength Concrete:
   1. Defined as either:
      a. Concrete whose average, of any sets of three consecutive 28-day compressive strength tests, is below the required 28-day strength.
      b. Concrete whose individual 28-day strength test (average of two cylinders) is more than 500 psi (3450 kPa) below the required 28-day strength.
   2. Should concrete meet either definition of low-strength concrete as a minimum, the Contractor shall take the following steps:
      a. Increase the cement content. The increase shall be based on a statistical evaluation of the strength data, the design water-cement ratio, compressive-strength curve, and acceptable mix-design literature as follows:
         (1) If sufficient concrete has been furnished to accumulate 30 tests, these should be used to establish a new target average strength in accordance with ACI 318, Section 5.3.
         (2) If less than 30 tests have been made, the new target average strength should be at least as great as the average strength used in the initial selection of the mix proportions. Increase the target average strength based on a statistical evaluation of the available strength data, the design water-cement ratio, compressive-strength curve, and acceptable mix-design literature. If the statistical average equals or exceeds the initial mix-design level, a further increase in the average level is required.
      b. Remove and replace with acceptable concrete when the quality and location of the low-strength concrete is such that Engineer considers the strength or durability of the structure is impaired and so orders.
   3. Low-strength concrete shall be considered defective Work as defined in GENERAL CONDITIONS.

B. Potentially Low-Strength Concrete: Defined as concrete whose 7-day test (average of two cylinders) is less than 70% of the specified minimum 28-day compressive strength.

C. Construction delays caused by low-strength or potentially low-strength concrete shall not relieve Contractor from responsibility for late completion even though extensions of time may be granted.

3.08 MISCELLANEOUS CONCRETE ITEMS:

A. Concrete Seal Coat:
   1. Apply to the ground surface immediately beneath all "on-grade" slabs and footings where indicated or specified.
   2. Seal coat shall consist of a concrete slab of the thickness indicated but not less than 2 inches (50 mm).
   3. Accurately screed so that the top of the seal coat will not be higher than the bottom elevation of structural slabs or footings to be placed thereon.
   4. Do not place seal coat until after all excavating, and piling in the area have been completed and all drain lines, conduits, and other items under the area are completed and properly backfilled and compacted.

B. Equipment Bases:
   1. Construct equipment bases, pads, and foundations as indicated or, when not indicated, conforming to equipment manufacturer's requirements.

2. Reinforce conforming to typical detail unless otherwise indicated.
3. Equipment bases shall include concrete, reinforcing steel, form work as required, and anchor bolts.
4. Finish top area of bases between anchor bolts and forms with a troweled finish.

3.09 TESTING:

A. Field Testing of Concrete Plant and Mixing Trucks:
   1. The concrete plant shall be inspected and tested to ensure conformance with ACI 304R and the "Concrete Plant Standards of the Concrete Plant Manufacturers Bureau." The scales shall be calibrated at the initial setup and at 3-month intervals thereafter.
   2. Mixing trucks shall be inspected and tested to ensure conformance with ACI 304R and "Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers Bureau" of the National Ready-Mix Concrete Association. Tests shall be done at initial setup and every 3 months thereafter.
   3. Submit test reports when requested.

B. Field Testing of Concrete and Making of Concrete Test Cylinders:
   1. Contractor shall furnish test equipment, test cylinder molds, and certified personnel to perform all required field tests, make the required concrete test cylinders, and deliver test cylinders (and beams) to the testing laboratory. The prescribed tests shall be made in the presence of or with the concurrence of the Owner.
   2. Field testing personnel shall be on Site throughout placement of concrete.
   3. Concrete sampling for tests and cylinder making shall be done conforming to ASTM C172. Samples shall be taken at random and at the point of truck discharge.
   4. Perform the following tests:
      a. Moisture content, ASTM C566. Perform this test a minimum of twice a day and adjust the amount of mix water to compensate for the moisture content of the aggregates.
      b. Prepare test cylinders conforming to ASTM C31, with not less than one set of cylinders (six cylinders) from each day's placement for each 100 cubic yards (75 cubic meters) or fraction thereof.
      c. Slump test conforming to ASTM C143. Perform tests on the first batch produced each day, for every 50 cubic yards (38 cubic meters) or fraction thereafter, and with every set of test cylinders. Additional tests shall be run when directed by Engineer.
      d. Air content test conforming to ASTM C231. Perform for first batch of day and with each set of test cylinders.
      e. The batch of concrete being tested for slump or air content shall not be placed until acceptable results are obtained.
      f. Discard concrete used for slump and air tests.
      g. Perform concrete and air temperature tests for first batch of day and with each set of test cylinders. Additional readings shall be taken when directed by Engineer.
      h. Any batch of concrete with slump or air content not in conformance with Specifications shall be rejected.
      i. Furnish slump, air content, and temperature test results to the testing laboratory for inclusion in the cylinder test reports.

C. Laboratory Testing of Aggregates and Concrete During Construction:
   1. An independent testing laboratory will be selected and paid by the Owner to perform the required laboratory tests and statistical evaluations of aggregates and concrete being used in the Work.

2. Laboratory will cure and test concrete cylinders conforming to ASTM C192 and C39, testing two cylinders at 3 days of age, two cylinders at 7 days of age, and two at 28 days of age.
3. Contractor shall have the right to observe all phases of concrete cylinder curing and testing. Should Contractor observe any deviations from the prescribed testing procedures that he considers detrimental to concrete strength test results, he shall immediately notify Owner in writing.
4. Contractor shall assist laboratory in obtaining Samples of fine and coarse aggregate for testing.
5. Contractor shall make arrangements with the testing laboratory to receive copies of test reports. The cost of providing a maximum of two copies of each report to the Contractor will be paid by Owner.
6. Should the test results indicate low strength concrete as defined in PART 3, ARTICLE 3.07 - LOW-STRENGTH CONCRETE, this Section, Contractor shall take immediate corrective action.
7. Should the statistical data indicate an excessive margin of safety, the concrete mix may be modified subject to Engineer's approval.
8. Should the material tests taken during construction indicate nonconformance with the Specifications, Contractor shall take immediate corrective action.

3.10 REPAIR, REPLACEMENT, AND FIELD MODIFICATIONS:

A. Embedded items and concrete that are misplaced or damaged during construction shall not be repaired, replaced, or field-modified without approval of Engineer.

END OF SECTION 033000

* * * * *

DIVISION 5 - METALS

SECTION 051200 - STEEL

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes fabrication and erection of the structural steel and other steel or metal items as defined in AISC Manual, Code of Standard Practice.

B. Related Work Specified Elsewhere:
   1. Concrete: DIVISION 3.

1.02 REFERENCES:

A. Applicable Standards:
   1. American Institute of Steel Construction (AISC):
      a. Steel Construction Manual.
      b. 303 - Code of Standard Practice for steel Buildings and Bridges.
   2. American Welding Society (AWS):
      a. D1.1 - Structural Welding Code - Steel.
      b. QC1 - Standard for AWS Certification of Welding Inspectors.
   3. American Society for Testing and Materials (ASTM):
      a. A6 - General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
      b. A36 - Carbon Structural Steel.
      c. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
      d. A106 - Seamless Carbon Steel Pipe for High-Temperature Service.
      e. A108 - Steel Bars, Carbon, Cold-Finished, Standard Quality.
      f. A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
      g. A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
      h. A193 - Alloy Steel and Stainless Steel Bolting Materials for High-Temperature Service.
      i. A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
      j. A325 -High-Strength Bolts for Structural Steel Joints.
      k. A449 - Quenched and Tempered Steel Bolts and Studs.
      l. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
      m. A563 - Carbon and Alloy Steel Nuts.
      n. A569 - Steel, Carbon (0.15 Maximum Percent) Hot-Rolled Sheet and Strip.
      o. A572 - High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
      p. A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
      q. A992 - Structural Steel Shapes.
      r. B695 - Coatings of Zinc Mechanically Deposited on Iron and Steel.
      s. C1107 - Packaged, Dry Hydraulic Cement Grout (Nonshrink).
      t. F436 - Hardened Steel Washers.
      u. F1554 - Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
   4. The National Association of Architectural Metal Manufacturers (NAAMM):
      a. MBG 531 - Metal Bar Grating Manual.
      b. MBG 532 - Heavy Duty Metal Bar Grating Manual.

c. MBG 533 - Welding Specifications for Fabrication of Steel, Aluminum and Stainless Steel Bar Grating.

5. Research Council on Structural Connections (RCSC):
   a. Specification for Structural Joints Using ASTM A325 Bolts or A490 Bolts as endorsed by AISC.
6. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
   a. SP1 - Solvent Cleaning.
   b. SP3 - Power Tool Cleaning.
   c. SP5 - White Metal Blast Cleaning.
   d. SP6 - Commercial Blast Cleaning.
   e. SP10 - Near-White Blast Cleaning.
   f. SP11 - Power Tool Cleaning to Bare Metal.
7. Occupational Safety and Health Administration (OSHA) - All applicable OSHA regulations, including, but not limited to 29 CFR Part 1910 and Part 1926 Subpart R - Steel Erection.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Includes, but not limited to, the following:
   1. Fabrication and erection drawings for all Work. A reproduction of Engineer-prepared Contract Drawings may be used for erection drawings such as to indicate information on erection or to identify detail drawing references. Where the drawings are revised to show this additional information, Engineer's title block and professional seal shall be removed from the drawing. These erection drawings shall be revised for subsequent Engineer revisions to the Contract Drawings.
   2. All necessary information for the fabrication, including filler metal for welds, of the component part of the structure, presented on drawings to conform to recognized standard practice, AISC Manual and AWS Code.
   3. Drawings indicating stud shear connector spacing regardless of whether connectors are shop-applied or field-applied.
   4. Drawings showing each piece including anchor bolts marked for identification to correspond to erection drawings.
   5. Manufacturer's literature on products including, but not limited to, grating, stud shear connectors, grout, concrete anchors, and protective coatings.
   6. AWS Certified Welding Inspector Certificates.
   7. Qualified welding procedure specifications and procedure qualification test results if welding processes differ from those prequalified by AWS.

C. Mill Tests:
   1. Furnish two copies of each certified mill test to Engineer upon request.

D. High-Strength Connection Bolt and Nut Manufacturer's Inspections Certificate:
   1. The Supplier shall certify that bolts, nuts, and washers furnished comply with all of the requirements of these Specifications, and shall provide complete manufacturer's mill test reports (Manufacturer's Inspections Certificate).
   2. For fasteners to be accepted by Contractor, certificate numbers shall appear on the product containers and correspond to the identification numbers on the mill test reports.
   3. Manufacturer's symbol and grade markings shall appear on all bolts and nuts.

1.04 QUALITY ASSURANCE:

A. Welder Qualifications:
   1. Welders shall be previously qualified by passing the tests prescribed in the AWS D1.1 or by passing such other tests as Engineer may accept. Welders of stainless steel shall be previously qualified in accordance with AWS D1.6.
   2. Welders shall have been tested within the past 12 months, and their qualification shall be considered as remaining in effect unless the welder is not engaged in a given process of welding for a period exceeding 6 months.
   3. Submit two certified copies of the qualification records to Engineer as evidence of qualification to the above-mentioned code.

B. Inspection: Material or workmanship may be subject to inspection in the shop and field.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Store all steel and appurtenances blocked-up off the ground and in orderly stacks.

B. Protect all items with shop applied protective coatings from corrosion. Store in an environment and manner consistent with type of coating.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS:

A. Steel: Conform to the following unless otherwise indicated or specified.
   1. Wide flange (WF) shapes and tees cut from WF: ASTM A992, Grade 50.
   2. M shapes, channels, and angles: ASTM A36.
   3. Structural plates and bars: ASTM A572, Grade 50.

B. Connection Bolts, Nuts, and Washers:
   1. Conform to ASTM A325, Type 1, unless otherwise indicated or specificed.
   2. Be galvanized when connecting galvanized steel.
   3. Nuts: Conform to ASTM A563.
   4. Flat and beveled washers: Conform to ASTM F436.

C. Anchor Bolts:
   1. Conform to ASTM F1554 with yield strength as indicated on Drawings.
   2. Washers:
      a. For ASTM F1554: Conform to ASTM A572 Grade 50 plate washer.
      b. For Post-Installed Anchors: Conform to ASTM F436.
   3. Galvanize all anchor bolts, nuts, and washers.

D. Pipe for Structural Uses: Conform to ASTM A53, Type E or S, Grade B, or ASTM A106, Grade B.

E. Threaded Rods: Conform to ASTM A36, unless otherwise indicated or specified.

F. Welding:
   1. For ASTM A36 steel, use E70 electrodes for shielded metal arc welding, F7 series electrodes for submerged arc welding, E70T series electrodes for flux-cored arc welding, and ER70S series electrodes for gas metal arc welding. Select "matching" electrodes in accordance with Table 3.1 AWS D1.1.
   2. For ASTM A572, Grade 50 steel or ASTM A992 steel, use E70 low-hydrogen electrodes for shielded metal arc welding, F7 series electrodes for submerged arc welding, E70T series electrodes for flux-cored arc welding, and ER70S series electrodes for gas metal arc welding. Select "matching" electrodes in accordance with Table 3.1, AWS D1.1.

G. Galvanizing: Conform to ASTM A123 and ASTM A153, where indicated or specified to be galvanized. Nuts, bolts, and washers may be hot-dip galvanized to conform to ASTM A153 or mechanically galvanized to conform to ASTM B695.

2.02 STEEL FABRICATION:

A. Fabricate all steel to conform to AISC Code of Standard Practice for Structural Steel Buildings and Bridges, AISC 360, and applicable portions of OSHA 29 CFR Part 1910 and Part 1926.

B. Permissible variations for sweep, camber, length, and cross section of all steel members shall conform to ASTM A6, AISC Manual, Part 1 and AISC Code of Standard Practice unless indicated otherwise.

C. Welding:

1. All welding shall be shielded metal arc, submerged arc, or flux-cored arc, or gas metal arc. For gas metal arc welding, the short-circuiting mode of filler metal transfer is not permitted. Other welding processes may be used provided they are qualified by applicable tests as prescribed in the AWS D1.1 (AWS D1.6 for stainless steel) and approved by Engineer prior to use. For the use of any other welding process, submit a qualified welding procedure specification and the procedure qualification test results. Welding processes shall be approved for use only after receipt of specific written approval from the Engineer.
2. Conform to AWS Code, AISC Manual.
3. Contractor shall perform fabrication welding inspection in accordance with AWS D1.1. This welding inspection shall be performed by AWS Certified Welding Inspector(s) (CWI). All such Certified Welding Inspectors shall be qualified and certified in accordance with the provisions of AWS QC1. Only individuals so qualified shall be authorized to perform fabrication/erection or verification inspection of the welding performed under the provisions of AWS D1.1 and these Contract Documents. Certifications verifying the qualifications of welding inspectors shall be submitted to Engineer as Submittals prior to commencement of structural welding operations or prior to welding inspection performed by an individual welding inspector. Defective welds shall be corrected.

D. Shop Connections:

1. Weld or bolt at Contractor's option except when otherwise indicated or specified.
2. Shop portions of connections may be welded equivalent to any bolted connection specified if Engineer concurs.
3. Welded connections shall be as indicated or in accordance with acceptable alternative designs:
   a. Welds of connection angles to beam webs shall conform to AISC Manual, Part 10, Table 10-2 with particular regard for minimum web thickness. Provide longer connection angles or reinforce web as required.
   b. All butt-joint groove welds shall be complete penetration welds unless otherwise indicated and shall conform to the applicable standards in AISC Manual, Part 8, with special emphasis on maintaining root opening. Accomplish this for single-bevel, butt-joint welds by using backup plates or by chipping out and welding on the opposite side.
   c. Prepare weld bevels with a mechanically guided cutting torch or by grinding.
   d. Remove all run-out tabs.
4. Bolted connections shall conform to AISC Manual, Parts 9 and 10.

a. All bolted connections shall be made with 3/4-inch bolts, nuts, and washers unless otherwise indicated or specified.
b. Capacity of beam connections shall have a minimum capacity of that specified in AISC Manual, Part 10, Table 10-1 for "Oversize and Short-Slotted Holes" in slip-critical connections with the number of bolt rows indicated, unless noted otherwise.
c. Use the minimum number of rows of bolts for beam connections so that bottom row is at or below the centerline of the beam.

E. Provisions for Field Connections:
1. Provide with bolted connections unless otherwise indicated or specified. The number of rows and number of bolts indicated on the Drawings or stated in the Specifications is the minimum number of rows or bolts. Provide additional bolts or connection devices, if necessary, to comply with OSHA regulation 29 CFR 1926, Subpart R - Steel Erection.
2. Provide for field welding only when so indicated or when detail clearances make bolting impractical.
3. Provide all members to be field-welded with bolted erection connections adequate to resist erection stresses prior to field welding.

F. Comply with OSHA 29 CFR 1926, Subpart R - Steel Erection.

2.03 COLUMN BASE AND EQUIPMENT ANCHOR BOLTS:
A. Furnish as indicated.
B. Hot-dip galvanize after fabrication where indicated.

2.04 CONCRETE ANCHORS:
A. Furnish and install adhesive anchors where indicated. Adhesive anchors shall conform to Hilti HIT RE 500-SD injection adhesive with HAS-E Standard Rods.
B. Furnish sizes indicated and install to conform to manufacturer's printed instructions.
C. Concrete anchors shall be carbon steel with surface plating or galvanizing in accordance with manufacturer's standard.
D. Installed adhesive anchors shall not be disturbed or loaded until the anchor has been in place longer than the manufacturer's cure time for the adhesive.

2.05 GALVANIZING:
A. Galvanize all steel after fabrication where indicated or specified to be galvanized.

PART 3 - EXECUTION

3.01 PREPARATION:
A. Field-check location and elevation of column anchor bolts and footings before erecting structural steel columns.
B. Contractor shall submit the method and sequence of erection for acceptance.

3.02 STEEL ERECTION:
A. Erect all steel to conform to AISC specifications, codes, and standards or any local, state or federal codes which may exceed such requirements. Comply with applicable OSHA regulations including 29 CFR 1926, Subpart R - Steel Erection.
B. Protect steel and anchor bolt sleeves from entrapped water that can cause damage from freezing or corrosion.
C. Connections:

1. Unless otherwise indicated, or clearance is insufficient, connections shall be bolted slip-critical type.
2. Tighten high-strength bolts in slip-critical joints to correct bolt tension in accordance with AISC Manual, Part 16, "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
3. Where required for connection fit-up, bolt holes may be adjusted in one of the following manners (flame cutting or flame enlargement of holes is not allowed):
   a. Reamed to AISC allowable maximum size for oversized holes.
   b. Holes may be filled with weld metal, ground smooth, and field-drilled.
   c. Other Engineer-approved method.
4. Welded Connections:
   a. Make welded connections as indicated and leave all erection bolts in place after completion of welding unless otherwise indicated.
   b. Reinforce connections when members requiring fillet welds are not in contact.
   c. Use backup bars or spacer bars on all butt welds where root opening exceeds 3/16-inch.
   d. Remove all run-out tabs.

D. Welding and Welders:
1. The requirements for erection welding and welders shall be the same as specified for steel fabrication.
2. All welds shall be stamped with a mark identifying the welder. Remove welders from Work after two defective welds.
3. The Contractor shall perform erection-welding inspection in accordance with AWS D1.1. This welding inspection shall be performed by AWS Certified Welding Inspector(s) (CWI). All such Certified Welding Inspectors shall be qualified and certified in accordance with the provisions of AWS QC1. Only individuals so qualified shall be authorized to perform fabrication/erection or verification inspection of the welding performed under the provisions of AWS D1.1 Code and these Contract Documents. Certifications verifying the qualifications of welding inspectors shall be submitted to Engineer as Submittals prior to commencement of structural welding operations or prior to welding inspection performed by an individual welding inspector. Defective welds shall be corrected.

E. Protect pipe sleeves, other anchorage members, and concrete bases from deleterious materials at all times, and from water which may cause ice damage during freezing weather.

F. Concrete Anchors:
1. Install anchors to conform to manufacturer's printed instructions.
2. The hole tolerances, drill bits, and anchor installation torque shall be as per manufacturer's printed recommendations.

3.03 FIELD-PROTECTIVE COATINGS:

A. Surface Preparation: If grease or oils are present, SP1 - Solvent Cleaning must precede any other method specified. Prepare all surfaces by SSPC-SP11 and 1-mil profile depth.

B. Clean all shop-coated surfaces damaged from rust and mill scale, welding, and abrasion.

C. Field-Spotting Coat:
1. For Repair of Galvanized Surfaces:
   a. Repair areas in accordance with ASTM A780, Method A2 - Repair using zinc-rich paints.

b. Apply organic zinc-rich primer containing a minimum of 93% zinc in dry film by weight. Apply in multiple coats (allowing proper recoat time) to achieve 8 mils dry film thickness. Color shall approximately match color of galvanizing.
   (1) Crown North American Professional Products Co. Inc. - Cold galvanizing compound.
   (2) Sentry Chemical Company - Galvonic.
   (3) Subox, Division of Carboline - Galvanox Type II.
   (4) ZRC Worldwide - Cold Galvanizing Compound.

END OF SECTION 051200

SECTION 260526 - GROUNDING

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes the following:
   1. Buried ground grids and ground rods for the main plant, chimney, miscellaneous yard structures, manholes, and duct banks including ground risers from the grids. Maximum acceptable resistance of grid shall be 2 ohms.
   2. Connection of ground risers from the buried ground grid to structures.
   3. Extension and connection of ground risers to structures and electrical equipment, raceway, and systems.

1.02 REFERENCES:

A. Applicable Standards:
   1. National Fire Protection Association (NFPA):
      a. 70 - National Electrical Code (NEC).
      b. 780 - Standard for the Installation of Lightning Protection.
   2. American Society for Testing and Materials (ASTM):
      a. B8 - Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.
   3. Underwriters Laboratories (UL).
      a. 467 - Standard for Safety Grounding and Bonding Equipment.
   4. Institute of Electrical and Electronics Engineers (IEEE):
      a. IEEE C2 – National Electrical Safety Code.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.
B. Includes, but not limited to, catalog cuts for the following:
   1. Cable.
   2. Ground Rods.
   3. Connection Materials.
   4. Miscellaneous Grounding Equipment.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Ground Rods:
   1. Erico.
   2. Thomas & Betts.
   3. Hubbell.
B. Connection Materials:
   1. Exothermic-Type Welding Process:
      a. Erico (Cadweld).
      b. Tectoweld.
   2. Compression-Type Connectors:
      a. AMP.
      b. Burndy.
      c. Thomas & Betts.
   3. Cable-to-Equipment Ground Lugs and Miscellaneous Grounding Equipment.
      a. Burndy Corporation.
      b. O-Z/Gedney.

2.02 WIRE AND CABLE:

A. Type BC2 as specified in at the end of this SECTION.
B. Conductor Sizes:
   1. As specified for specific connections.
   2. For connections specified but sizes not indicated, use conductor sizes which conform to NEC, except use minimum 1/0 AWG if buried in earth or cast in concrete, and minimum No. 6 AWG at other locations.

2.03 GROUND RODS:

A. Copper-clad steel or copper-alloy sectional-type rods.
B. One end pointed to facilitate driving.
C. 3/4-inch diameter and furnished in 10-foot sections with diameter and total length stamped near top of rod.
D. Provide 10-foot ground rods except where otherwise indicated.

2.04 CONNECTION MATERIALS:

A. Cable-to-cable, cable-to-rod, and cable-to-steel connections.
   1. Exothermic-type welding process.
   2. Compression-type connectors.
B. Cable-To-Equipment Ground Lugs:
   1. Bolted Type:
      a. Copper alloy terminal with twin clamping element.
      b. Bolted to equipment housing with silicon bronze bolts and lock washers.
      c. Burndy "QIKLUG" type QQA.
   2. Split-Bolt Type:
      a. As indicated.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Wire and Cable:
   1. General:
      a. Install using as few joints as possible.
      b. Protect against unraveling, caging, and abrasion by several wrappings of plastic tape on all ends, where cable leaves concrete, and at necessary intermediate points.
      c. Install so as not to be entirely encircled or closely encircled by magnetic material.
      d. Suitably protect against damage during construction. Replace or suitably repair cable at Owner's discretion if cable is damaged by anyone before final acceptance.
   2. In Buried Installations:
      a. Exothermic-type welded connection only.
      b. Install at the depths specified or indicated. Otherwise install at least 30 inches below finished grade or deeper if necessary in order to be in contact with earth.
      c. Maintain clearance of at least 3 feet from all underground metal piping or structures where possible, otherwise tape all ground conductors within this clearance.
      d. Backfill with excavated earth free from frozen material, rocks, or stones. Thoroughly compact backfill.
B. Ground Rods:
   1. Install rods where indicated by driving and not by drilling or jetting.
   2. Drive rods into unexcavated position of the earth where possible.

3. Where rods must be installed in excavation areas, drive rods into earth after compaction of backfill is completed.
4. Drive to a depth such that top or rods will be approximately 30 inches below final grade, or subgrade, and connect to the buried grid ground conductors.

C. Connections:
1. Conform to manufacturer's instructions.
2. Chemically degrease and dry completely before welding.
3. Apply coal tar coating to all exothermic-welded connections to be buried after checking of connections by the Resident Project Representative.
4. Make up bolted connections clean and tight.
5. Low-resistance connections with resistance drop not exceeding 1 ohm.
6. Do not cover up connections before they are observed by the Resident Project Representative.

D. Buried Ground Grid:
1. Install where indicated and as specified.
2. Use 250 KCMIL ground conductor unless otherwise indicated.
3. Install beneath a minimum of 30 inches of earth cover or deeper if necessary in order to avoid structures such as foundations, caissons, and buried piping.
4. Ground grid risers for equipment, motors, structural steel, and related items, shall be the same size as the buried ground grid.

END OF SECTION 260526

Burns & McDonnell Engineering Company Engineers - Architects - Consultants Kansas City, Missouri	WIRE AND CABLE SPECIFICATION SHEET	
	BC2 **B&McD TYPE:**	**NEC TYPE:**

BARE COPPER GROUND CABLE

GENERAL REQUIREMENTS:

Annealed, coated, bare copper (ASTM B33)

SPECIFIC REQUIREMENTS:

1. Solid in sizes 4 AWG and smaller.
2. Class B stranded in sizes 2 AWG and larger (ASTM B8).

DIVISION 31 - EARTHWORK

SECTION 312050 - SITE PREPARATION AND EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes all demolition, subgrade preparation, excavating, trenching, filling, embankment construction, backfilling, compacting, grading, riprapping, topsoiling, and all related items necessary to complete the Work indicated or specified.

B. Related Work Specified Elsewhere:

1. Section 321100 -- Crushed Rock Base and Surface Course

1.02 REFERENCES:

A. Applicable Standards:

1. American Society for Testing and Materials (ASTM) (Equivalent AASHTO standards may be substituted as approved):
   a. C33 - Concrete Aggregates.
   b. C88 - Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
   c. C144 - Aggregate for Masonry Mortar.
   d. C173/C173M - Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
   e. C231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   f. C403/C403M - Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance.
   g. C618 - Coal Fly Ash and Raw or Natural Pozzolan for Use as a Mineral Admixture in Concrete.
   h. D75 - Practice for Sampling Aggregates.
   i. D422 - Test Methods for Particle-Size Analysis of Soils.
   j. D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3).
   k. D1140 - Test Methods for Amount of Material in Soils Finer than the No. 200 Sieve.
   l. D1241 - Materials for Soil-Aggregate Subbase, Base, and Surface Courses.
   m. D1556 – Test Method for Density and Unit Weight of Soil In-place by the Sand Cone Method.
   n. D1557- Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3).
   o. D2167 - Test Method for Density and Unit Weight of Soil in-Place by the Rubber Balloon Method.
   p. D2487 - Classification of Soils for Engineering Purposes (Unified Soil Classification System).
   q. D3776 – Test Methods for Mass per Unit Area (Weight) of Fabric.
   r. D4253 - Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
   s. D4254 - Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

t. D4318 - Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
u. D4546 - Test Methods for One-Dimensional Swell or Settlement Potential of Cohesive Soils.
v. D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
w. D4751 - Test Method for Determining the Apparent Opening Size of a Geotextile.
x. D6241 - Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
y. D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

2. Occupational Safety and Health Administration (OSHA):
   a. 29 CFR Part 1926 - Safety and Health Regulations for Construction.
3. Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction 2012.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.
B. Includes, but not limited to, the following:
   1. Manufacturer's product certification.
   2. Test results from laboratory testing of granular material and trench stabilization material.
C. Where selecting an option for excavation, trenching, and shoring in compliance with local, state, or federal safety regulations such as OSHA 29 CFR Part 1926 or successor regulations, which require design by a registered professional engineer, submit (for information only and not for Owner approval) the following:
   1. Copies of design calculations and notes for sloping, benching, support systems, shield systems, and other protective systems prepared by or under the supervision of a professional engineer legally authorized to practice in the jurisdiction where the Project is located.
   2. Documents provided with evidence of registered professional engineer's seal, signature, and date in accordance with appropriate state licensing requirements.

1.04 QUALITY ASSURANCE:

A. Sampling and Testing:
   1. Tests to determine conformance with all requirements of this Specification for quality and properties of all Contractor -secured materials, including borrow materials (both on or off Site) proposed for use, shall be performed by an independent, commercial laboratory retained and compensated by Contractor, and approved by Owner.
   2. When incorporating materials into the Project, quality control testing will be performed during construction by a testing laboratory retained and compensated by Owner.

1.05 PROJECT CONDITIONS:

A. Lines and grades shall be as indicated. Contractor shall establish and set construction benchmarks as required to complete the Work.
B. Carefully maintain all benchmarks, monuments, and other reference points and replace as directed by Owner if disturbed or destroyed.
C. Temporary Erosion and Sediment Controls: Furnish, install, construct, and maintain temporary measures to control erosion and minimize the siltation of intermittent streams and the pollution of private properties. Temporary erosion and sediment control measures shall be constructed in substantial compliance with local, state, federal, and jurisdictional agency's regulations and

Contract Drawings (if applicable). Temporary erosion and sediment control measures shall be maintained until completion of the Work.

D. Disposition of Utilities:
   1. Existing underground utilities are shown on Contract Drawings using the best information available at the time of drawing preparation. Contractor shall identify, locate and protect all underground utilities which may be affected by construction under this Contract before starting excavation or other Site construction activities which could damage existing utilities.
   2. Remove or relocate only as indicated, specified, or directed. Provide a minimum 48-hours' notice to Owner and receive written notice to proceed before interrupting any utility service.
   3. Adequately protect from damage all active utilities and remove or relocate only as indicated or approved.
   4. Report active, inactive, and abandoned utilities encountered in excavating and grading operations that are not indicated on Contract Drawings. Remove, plug, or cap as directed by Owner.
   5. Provide as-constructed drawings of Underground Facilities either not shown or found at locations that differ from those shown on Contract Drawings.

E. Survey work, to accurately determine locations, elevations, and quantities of Contract pay items, shall be performed during the course of construction by Professional Surveyor registered in the state of Kentucky. Surveyor shall be retained and compensated by Contractor.

PART 2 - PRODUCTS

2.01 MATERIALS ENCOUNTERED:

A. Suitable Materials: Materials suitable for use in embankment and fill include material that is free of debris, roots, organic matter, frozen matter, and which is free of stone having any dimension greater than 2 inches in areas requiring a high degree of compaction, or 4 inches in other embankment and fill areas:
   1. Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands generally exclusive of clayey and silty material with the following properties:
      a. Are free-draining.
      b. Impact compaction will not produce a well-defined moisture-density relationship curve.
      c. Maximum density by impact methods will generally be less than by vibratory methods.
      d. Generally less than 15% by dry weight of soil particles pass a No. 200 square-mesh sieve.
   2. Cohesive materials include materials made up predominately of silts and clays generally exclusive of sands and gravel with the following properties:
      a. Impact compaction will produce a well-defined, moisture-density relationship curve.
      b. Are not free draining.

B. Unsuitable Materials: Materials unsuitable for use in embankment and fill include all material that contains debris, roots, organic matter, frozen matter, shale particles, or material containing gravel or stone with any dimension greater than 2 inches in areas requiring a high degree of compaction or 4 inches in other embankment and fill areas, or other materials that are

determined by Owner as too wet or otherwise unsuitable for providing a stable subgrade or stable foundation for structures.

C. All Materials encountered, regardless of type, character composition and condition thereof, shall be considered "unclassified" for the purpose of payment. Determine quantity of various materials to be excavated prior to submitting Bid. Rock encountered shall be handled at no extra cost to Owner.

D. Waste Materials:

1. Waste materials, as described for purposes of this Section, consist of unsuitable materials, excess suitable material, rock, demolition debris, and other materials considered unacceptable for use as fill, and which are not environmentally contaminated. Waste materials shall not include environmental pollutants, hazardous substances, contaminated products, by-products, samples, or waste materials of any kind that are regulated under environmental laws.
2. Dispose of waste materials in accordance with Paragraph 3.03F.

2.02 BORROW MATERIALS:

A. Suitable fill materials, granular materials, and topsoil obtained from locations arranged for by Contractor. Required to the extent sufficient suitable materials are not obtained from excavation and trenching.

B. Obtain, excavate, haul, handle, place, and compact borrow materials.

C. Borrow materials shall not exhibit characteristics of high shrink-swell potential as determined from Atterberg limit tests (ASTM D4318) and/or swell tests (ASTM D4546) unless otherwise specified herein. Material shall have a liquid limit not exceeding 40 or a plastic index not exceeding 17 when tested in accordance with ASTM D4318.

2.03 GRANULAR MATERIAL:

A. Crushed stone or crushed gravel shall comply with SECTION 321100 - CRUSHED ROCK BASE AND SURFACE COURSE. Use at all locations where granular material is required unless otherwise indicated or specified.

B. Pipe Bedding Material for exterior coated steel pipe and coated buried tanks shall be clean, natural sand conforming to ASTM C144 (masonry aggregate) or ASTM C33 (fine concrete aggregate) with not more than 5% by weight passing the No. 200 sieve.

Standard Square Mesh Sieve U.S. Size or No.	ASTM C33 Percent Passing	ASTM C144 Percent Passing
3/8-inch	100	--
No. 4	95 to 100	100
No. 8	80 to 100	95 to 100
No. 16	50 to 85	70 to 100
No. 30	25 to 60	40 to 75
No. 50	10 to 30	10 to 35
No. 100	2 to 10	2 to 15
No. 200	--	0 to 5

2.04 EMBANKMENT AND FILL MATERIAL:

A. Material shall be free of roots or other organic matter, refuse, ashes, cinders, frozen earth, or other unsuitable material.
B. Use suitable material sufficiently friable for embankment to provide a dense mass free of voids and capable of satisfactory compaction.
C. Do not use material containing gravel, stones, or shale particles greater than 3" in dimension, or more than one-half the depth of the lift to be compacted.
D. Perform moisture curing by wetting or drying of the material as required to attain required compaction criteria.
E. Material shall have a liquid limit not exceeding 40 or a plastic index not exceeding 25 when tested in accordance with ASTM D4318.

2.05 TRENCH STABILIZATION MATERIAL:

A. Granular material as specified or conform to ASTM D1241, Gradation A or B, well-graded, with not more than 10% passing No. 200 sieve.

2.06 RIPRAP:

A. Riprap Stone Material:
   1. Quarry-run stone with stones weighing 70 to 140 pounds each. At least 75% shall weigh more than 85 pounds each.
   2. Stones shall be durable, free from cracks, seams, and other defects which would tend to increase deterioration from natural causes.
   3. Dirt, sand, or clay shall not exceed 5% by weight.
   4. Quantity of rock with an elongation greater than 3:1 shall not exceed 20% of the mass. No stone shall have an elongation greater than 4:1.
   5. Not more than 10% of the stone shall show splitting, crumbling, or spalling when subjected to 5 cycles of the sodium soundness test as required by ASTM C88.
   6. Apply riprap on slopes and ditches as indicated unless specified otherwise.

2.07 GEOTEXTILE FABRIC:

A. Riprap Filter Fabric Material:
   1. Geotextile Fabric Filter for riprap application:
      a. Filter Fabric shall be a non-woven fabric consisting of continuous chain polymeric filaments or yarns of polyester, or polypropylene formed into a stable network by needle punching.
      b. Filter Fabric shall be resistant to mildew and rot, ultraviolet radiation, insects and rodents.
      c. Filter Fabric shall conform to the following minimum requirements which shall be the minimum average roll values for the roll of geotextile:
         (1) Weight: 14 oz/sq yd as determined by ASTM D3776.
         (2) Puncture Strength: 1000 lbs as determined by ASTM D6241.
         (3) Grab Tensile Strength: 380 lbs as determined by ASTM D4632.
         (4) Elongation at Failure: 50% as determined by ASTM D4632.
         (5) Apparent Opening Size: 100 sieve as determined by ASTM D4751.

B. Non-Woven Fabric:
   1. Geotextile Fabric for yard surface aggregate subgrade segregation:
      a. Geotextile Fabric shall be a nonwoven fabric consisting of continuous chain polymeric filaments or yarns of polyester, or polypropylene formed into a stable network by needle punching.

b. Geotextile Fabric shall be resistant to mildew and rot, ultraviolet radiation, insects and rodents.
c. Geotextile Fabric shall conform to the following minimum requirements which shall be the minimum average roll values for the roll of geotextile:
(1) Weight: 6 oz/sq yd as determined by ASTM D3776.
(2) Puncture Strength: 350 lbs as determined by ASTM D6241.
(3) Grab Tensile Strength: 135 lbs as determined by ASTM D4632.
(4) Elongation at Failure: 55% as determined by ASTM D4632.
(5) Apparent Opening Size: 70 sieve as determined by ASTM D4751

C. Woven Fabric:
1. Geotextile Fabric for road aggregate subgrade segregation
a. Geotextile Fabric shall be a woven fabric consisting of continuous chain polymeric filaments or yarns of polyester, or polypropylene formed into a stable woven network.
b. Geotextile Fabric shall be resistant to mildew and rot, ultraviolet radiation, insects and rodents.
c. Geotextile Fabric shall conform to the following minimum requirements which shall be the minimum average roll values for the roll of geotextile:
(1) Weight: 7 oz/sq yd as determined by ASTM D3776.
(2) Puncture Strength: 900 lbs as determined by ASTM D6241.
(3) Grab Tensile Strength: 300 lbs as determined by ASTM D4632.
(4) Elongation at Failure: 12% as determined by ASTM D4632.
(5) Apparent Opening Size: 40 sieve as determined by ASTM D4751

PART 3 - EXECUTION

3.01 DEMOLITION:

A. Remove existing structures as required to allow the new construction.
B. Carefully dismantle, in a manner to avoid damage, all materials and equipment indicated to be relocated or returned to Owner.
C. Material or equipment, specified or indicated to be relocated or returned to Owner, that is damaged due to Contractor's negligence shall be repaired or replaced, as determined by Owner, at no additional cost to Owner.
D. Materials not indicated or specified to be relocated or returned to Owner shall become property of Contractor and be disposed of as specified in "Waste Materials," this Part.
E. Perform demolition work to protect existing facilities, structures, and property which are to remain, against damage from operations, falling debris, or other cause.
F. Make provisions for temporarily accommodating flows in existing facilities that are to be relocated or disturbed.
G. Take precautions to guard against movement or settlement, and provide shoring and bracing as necessary.
H. If at any time safety of existing structure to remain is endangered, cease operations, notify Owner, and do not resume operations prior to approval.
I. Remove concrete by jack hammering, sawing, core drilling, or other approved method.
J. Remove existing pavement by jack hammering, sawing, scarifying, or other approved methods except as follows:
1. Existing asphaltic or Portland cement concrete pavement shall be sawed at point where pavement indicated to remain ends and pavement indicated to be removed begins.

2. Existing Portland cement concrete pavement shall be removed back to the nearest joint unless otherwise indicated or approved by Owner.

3.02 SITE PREPARATION:

A. Silt Fence:
   1. Install silt fence as indicated and as follows:
      a. On the downslope side(s) of all disturbed areas.
      b. On the downslope side(s) of all stockpile areas.
   2. Inspection:
      a. Daily in areas of active construction or equipment operation.
      b. Weekly in areas with no construction or equipment operation.
      c. Within 24 hours of each 0.5-inch or greater rainfall event.
      d. Complete inspection reports after each inspection and submit to Owner within 2 working days.
   3. Maintenance:
      a. Remove sediment from behind silt fence when it reaches one-third the height of fence. Place removed sediment in topsoil stockpile areas.
      b. Any silt fence damaged so it can not perform its intended function shall be replaced as indicated or as directed by Owner.
      c. Remove silt fence after area has been surfaced or seeded and has been accepted by Owner.

B. Construction Access:
   1. Immediately remove by shoveling and/or sweeping all sediment tracked from the construction area onto Site access roads. Place sediment in stockpile areas.

C. Clearing and Grubbing:
   1. Perform only in areas where earthwork or other construction operations are to be performed.
   2. Clear areas and dispose of other trees, brush, and vegetation before starting construction.

D. Stripping:
   1. Remove topsoil from areas within limits of excavation, trenching and borrow, and areas designated to receive embankment and compacted fill.
   2. Scrape areas clean of all brush, grass, weeds, roots, and other material.
   3. Strip to depth of approximately 6 inches or to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required to segregate topsoil, or as directed by Owner.
   4. Stockpile topsoil in areas where it will not interfere with construction operations or existing facilities. Stockpiled topsoil shall be reasonably free of subsoil, debris, and stones larger than 2 inches in diameter.
   5. Remove waste from the Site.

3.03 EXCAVATION AND TRENCHING:

A. Sheeting and Bracing:
   1. Design, furnish, place, maintain, and subsequently remove, to extent required, a system of temporary supports for cut and cover, open cut, or trench excavations, including bracing, dewatering, and associated items to support sides and ends of excavations where excavation slopes might endanger in-place or proposed improvements, extend beyond construction right-of-ways, or as otherwise specified or indicated.

2. Provide all materials on Site prior to start of excavation in each section, and make such adjustments as are required to meet unexpected conditions.
3. Space and arrange sheeting and bracing as required to exclude adjacent material and according to stability of excavation slopes.
4. Assess existing conditions including adjacent property and possible effects of proposed temporary works and construction methods; and select and design such support systems, methods, and details as will assure safety to the public, adjacent property, and the completed Work.
5. Modify or relocate underground facilities, at no additional cost to Owner, if existing underground facilities interfere with Contractor's proposed method of support.
6. Use caution in areas of underground facilities, which shall be exposed by hand or other excavation methods acceptable to Owner.
7. Perform sheeting, shoring, and bracing in accordance with safety and protection requirements of the Contract Documents.
8. Coordinate sheet piling work with Owner prior to start of work. Sheet piling shall not be driven while the existing plant is in operation.
9. Provide sheeting, shoring, and bracing for trench excavation in subgrade of excavation when required to prevent movement of the main excavation support system.
10. Provide shoring, sheeting, and bracing as indicated or as needed to meet the following requirements:
    a. Prevent undermining and damage to all structures, buildings, underground facilities, pavements, and slabs.
    b. Perform excavations with vertical banks where necessary for construction activities or as indicated, and also within all limits of excavation noted on Drawings.
    c. Design excavation support system and components to support lateral earth pressures, unrelieved hydrostatic pressures, utility loads, traffic and construction loads, and building and other surcharge loads to allow safe and expeditious construction of permanent structures without movement or settlement of the ground, and to prevent damage to or movement of adjacent buildings, structures, underground facilities, and other improvements. Design shall account for staged removal of bracing to suit the sequence of concrete placement for permanent structures and backfill.
    d. Except as otherwise specified herein, shoring and sheeting materials may be extracted and reused at Contractor's option; however, Contractor shall remove and replace any existing structure or underground facility damaged during shoring and sheeting. Remove sheeting and bracing as backfill progresses. Fill voids left after withdrawal with sand or other material approved by Owner.
    e. Where shoring and sheeting materials must be left in-place in the completed Work to prevent settlements to or damage within adjacent structures or as directed by Owner, backfill the excavation to 3 feet below finished grade and remove the remaining exposed portion of shoring before completing backfill. If soldier piles and wood lagging are used for shoring, remove wood lagging to within 3 feet of finished grade in incremental steps of approximately 6 inches as backfill is placed, or to Contractor's design if more stringent. Location of all shoring and sheeting left in-place shall be documented on Contractor-furnished construction record drawings and provided to Owner.
11. Contractor shall be solely responsible for proper design, installation, operation, maintenance, and any failure of any component of the system. Review by Owner of

drawings and data submitted by Contractor shall not in any way be considered to relieve Contractor from full responsibility for errors therein or from the entire responsibility for complete and adequate design and performance of the sheeting and shoring system.

12. Provision for Contingencies:
    a. Performance of components of the support system shall be monitored for both vertical and horizontal movement three times a week.
    b. Provide a contingency plan or alternative procedure for implementation, if system does not adequately perform.
    c. Keep materials and equipment necessary to implement the contingency plan readily available.
13. Damages:
    a. Document all existing damage to adjacent facilities and submit information to Owner prior to performing any excavation. Documentation shall include a written description, diagrams, measurements, and appropriate photographs.
    b. Repair all damage resulting from Contractor's excavation and remove and replace all undermined pavements with Owner-approved equal, either concrete or asphalt, at no expense to Owner.

B. Explosives: Blasting will not be permitted.

C. Excavation for Structures:
1. Excavate area adequate to permit efficient erection and removal of forms.
2. Trim to neat lines where details call for concrete to be deposited against earth.
3. Excavate by hand in areas where space and access will not permit use of machines.
4. Notify Owner immediately when excavation has reached the depth indicated.
5. Overexcavate and replace any localized zones of excessively wet, unstable, organic, yielding, or low bearing capacity materials as directed by Owner. Restore bottom of excavation to proper elevation with concrete; compacted fill or compacted granular material in areas overexcavated. Correct at no additional cost to Owner when overexcavated without authority or to stabilize bottom rendered unsuitable through negligence or improper dewatering or other operations.
6. Top with 3-inch concrete seal coat where indicated and where required to provide satisfactory subgrade for structural base slabs.

D. Trenching for Underground Utilities:
1. Side Walls:
    a. Make vertical or sloped within specified trench width limitations below a plane 12 inches above top of pipe.
    b. Make vertical or sloped (stepped) as required for stability, above a plane 12 inches above top of pipe.
    c. Excavate without undercutting sidewalls.
2. Trench Depth:
    a. Excavate to depth sufficient to provide the minimum bedding requirements for the pipe being placed.
    b. Do not exceed that indicated where conditions of bottom are satisfactory.
    c. Increase depth as necessary to remove unsuitable supporting materials.
    d. Maintain a minimum of 1feet of soil cover above top of pipe.
3. Trench Bottom:
    a. Protect and maintain when suitable natural materials are encountered.
    b. Remove rock fragments and materials disturbed during excavation or raveled from trench walls.

4. Restore to proper subgrade with trench stabilization material when over excavated.
5. Trench Width:
   a. Excavate trench to a width which will permit satisfactory jointing of pipe and thorough tamping of bedding and backfill.
   b. Do not exceed following trench widths:
      (1) For single pipe installation, maintain trench widths below a plane 12 inches above top of pipe as follows:

	Trench Width	
Nominal Pipe Size	Minimum	Maximum
Less than 24"	Pipe od + 1'	Pipe od + 2'
24" to 60"	Pipe od + 2'	Pipe od + 4'
Larger than 60"	Pipe od + 3'	Pipe od + 5'

      (2) For multiple pipe installations maintain trench widths below a plane 12 inches above the top of the largest pipe as follows:

	Trench Clearances	
Nominal Pipe Size of Outside Pipe	Minimum from Outside Pipe	Maximum from Outside Pipe
Less than 24"	6"	12"
24" to 60"	12"	24"
Larger than 60"	18"	30"

      (3) Above plane defined in (1) and (2), no maximum limit.
      (4) Maximum trench width limitations shall apply in all areas more than 3 feet from manhole or structure walls.
      (5) Maximum width shall be as near the minimum specified as can be controlled by construction equipment and methods used.
6. Perform trench fill only after compacted fill or embankments have reached an elevation of not less than 1 foot above top of pipe.
7. Test Pits:
   a. Excavate test pits sufficiently in advance of trenching to enable adequate planning of construction procedure.
   b. Locate as follows:
      (1) When unstable material is suspected that may require special protective measures.
      (2) Where groundwater may require special handling methods.
      (3) Where indicated or otherwise approved.
      (4) Where interference or conflict with other utilities or structures could affect alignment of pipe.
   c. To depth required to obtain information desired.

E. Dewatering:
   1. General:
      a. Design and provide a dewatering system using accepted and professional methods of design and engineering consistent with the best current practice to eliminate water entering excavation under hydrostatic head from bottom and/or sides.

(1) Design system to prevent differential hydrostatic head because of rising water levels from adjoining or nearby bodies of water, proximity of excavation to phreatic groundwater level, or surface runoff, resulting in a "quick" or "boiling" condition.
(2) System shall not be dependent solely upon sumps and/or pumping water from within excavation where differential head would result in a "quick" condition, and continue to worsen the excavation's stability.

b. Provide dewatering system of a sufficient size and capacity as required to control ground and surface water flow into excavation and to allow all Work to be installed in a dry condition, including the obtaining of a licensed well-driller, where required.
c. Control, by acceptable means, all water regardless of source and be fully responsible for disposal of water.
d. Confine all discharge piping and/or ditches to available easement or to additional easement obtained by Contractor. Provide all necessary means for disposal of water, including the obtaining of all necessary permits and of additional easement at no additional cost to Owner.
e. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures.
(1) Where necessary to these purposes, lower water level in advance of excavation, using wells, wellpoints, jet eductors, or similar positive methods.
(2) Water level as measured in piezometers shall be maintained a minimum of 3 feet (1 meter) below the prevailing excavation level.
f. Provide means for positive dewatering of all water sources prior to any appearance of water in excavation and continue until Work is complete to the extent that no damage results from hydrostatic pressure, flotation, or other causes.
g. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.
h. Install wells and/or wellpoints, if required, with suitable screens and filters, so that continuous pumping of fines does not occur. Arrange the discharge to facilitate collection of samples by Owner or Resident Project Representative. During normal pumping, and upon development of well(s), levels of fine sand or silt in discharge water shall not exceed the allowed site permitted limit. Install a sand tester on discharge of each pump during testing to verify that levels are not exceeded.
i. Install, operate, and maintain dewatering system required to control surface and/or groundwater.
j. Control grading around excavations to prevent surface water from flowing into excavation areas.
k. Drain or pump as required to continuously maintain all excavations and trenches free of water or mud from any source, and discharge to approved drains or drainage channels. Commence when water first appears and continue until Work is complete to the extent that no damage will result from hydrostatic pressure, flotation, buoyancy, or other causes.
l. No additional payment will be made for any supplemental measures to control seepage, groundwater, or artesian head.

2. Design:
a. Designate and obtain services of a qualified dewatering specialist or expert to provide a dewatering plan as may be necessary to complete the Work. Provide

dewatering plan at time of Bid submission. Plan items shall include, but not be limited to, the following:

(1) Drawings indicating general location and size of berms, dikes, ditches, all deep wells, observation piezometer wells, wellpoints, jet eductors, sumps and discharge lines, including their relation to water disposal ditches.
(2) Make, model, and capacities of pumps, prime movers, power generators, and standby equipment.
(3) Design calculations, including any computer modeling, to show adequacy of system and selected equipment, estimated flow rate of water to be discharged, and estimated duration for groundwater to be drawn down to elevations required for excavation.
(4) Detailed description of dewatering procedure and maintenance method.
(5) Description of emergency plan to protect in-place construction during an unanticipated rise in groundwater due to loss of power or other unexpected conditions or inundation from surface water.
(6) Additional details, as requested by Owner.
(7) Specific items to be included addressing dewatering operations using wells, wellpoints, or jet eductors shall consist of the following:
    (a) Diameter of hole drilled.
    (b) Type of equipment and method of well installation.
    (c) Diameter and material type of well casing inserted.
    (d) Elevation of top of each well.
    (e) Screen opening sizes.
    (f) Screened interval or elevations of segments in well that are screened.
    (g) Backfill gravel pack zone elevations.
    (h) Gravel pack gradation.
    (i) Size of pumps (horsepower)(watts).
    (j) Anticipated pumping capacity (gpm) (L/s).
    (k) Drawdown in well with time during pumping.
    (l) Drawdown in piezometers with time during pumping.
    (m) Number and location of wells.
    (n) Number and location of piezometers.
    (o) Wellpoint details.
    (p) Certification license of well-driller, where required.

b. In preparing dewatering plan, consider all available information, together with Site constraints, excavation/sheeting requirements, and construction schedule. Other potential problems may require specific reference and amplification within dewatering plan.
c. After completion of dewatering installation and prior to commencement of excavation, submit to Owner for review a detailed plan of dewatering system as constructed, together with test data and computations demonstrating that the system is capable of achieving specified results.
d. Contractor shall be solely responsible for proper design, installation, operation, maintenance, and any failure of any component of system. Notice to Proceed issued by Owner or submittal of dewatering plans and data by Contractor shall not relieve Contractor from full responsibility for errors therein or for complete and adequate design and performance of system in controlling water level in excavated areas and for control of hydrostatic pressures to depths specified.

e. Contractor shall be responsible for accuracy of drawings, design data, and operational records required by this Section.
f. Piezometers and Groundwater Monitoring:
   (1) Install as a minimum two piezometers, in addition to any required by regulating agencies having jurisdiction, at locations prior to excavation below the groundwater level for purpose of monitoring groundwater elevations in vicinity of excavation. Design and location of piezometers will be subject to review by Owner.
   (2) Observe and record twice daily the elevation of groundwater in all piezometers on a daily basis 7 days a week, and furnish a daily written summary of observations to Resident Project Representative. Record groundwater elevations to nearest 0.1 foot , with observations conducted throughout duration of any dewatering, and until dewatering is no longer required.
   (3) Monitor upstream and downstream river/stream levels to anticipate rising groundwater levels.
   (4) Repair or replace within 24 hours piezometers that become inactive, damaged, or destroyed. If required, suspend excavation and construction activities in areas where piezometers are not functioning properly until reliable observations can be made. Add or remove water from piezometer risers and demonstrate that piezometers are functioning properly.
   (5) Remove and grout piezometers when dewatering is completed, and in accordance with jurisdictional agencies.

3. Damages:
   a. Repair without additional cost to Owner any damage to Work in-place, other subcontractor's equipment, utilities, residences, highways, roads, railroads, private and municipal well systems, adjacent structures, and the excavation, including damage to the bottom due to heave and including but not limited to, removal and pumping out of the excavated area that may result from Contractor's negligence, inadequate or improper design and operation of dewatering system, and any mechanical or electrical failure of dewatering system.
   b. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to Owner.
4. Maintaining Excavation in Dewatered Condition:
   a. Dewatering shall be a continuous operation. Interruptions due to power outages, or any other reason shall not be permitted.
   b. Continuously maintain excavation in a dry condition with positive dewatering methods during preparation of subgrade, installation of pipe, and construction of structures until critical period of construction and/or backfill is completed to prevent damage of subgrade support, piping, structure, side slopes, or adjacent facilities from flotation, or other hydrostatic pressure imbalance.
   c. Provide standby equipment on Site, installed, wired, and available, for immediate operation if required to maintain dewatering on a continuous basis in event any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, perform such work as may be required to restore damaged structures and foundation soils at no additional cost to Owner.

d. Subsequent to completion of excavation and during installation of all Work in the excavated area, maintain the excavation in a dewatered condition.
e. System maintenance shall include but not be limited to 24-hour supervision by personnel skilled in the operation, maintenance, and replacement of system components, and any other work required to maintain the excavation in a dewatered condition.

5. System Removal:
   a. Remove all dewatering equipment from Site, including related temporary electrical service.
   b. All wells shall be removed or cut off a minimum of 3 feet below the final ground surface, capped, and abandoned in accordance with regulations by agencies having jurisdiction.
   c. Removal work required under this paragraph does not include any Site cleanup work as required elsewhere in these Specifications.

F. Waste Materials:
   1. Remove unsuitable materials from Work area as excavated.
   2. Contractor shall remove and dispose all unsuitable excess material offsite.
   3. Segregate excess suitable materials and topsoil from unsuitable materials for possible use by onsite. Spread or place in areas as directed by Owner onsite.

3.04 EARTHWORK:

A. Subgrades:
   1. General:
      a. Excavate or backfill as required to construct subgrades to elevations and grades indicated.
      b. Remove all unsuitable material and replace with acceptable fill material and perform all wetting, drying, shaping, and compacting required to prepare subgrade.
      c. Proofrolling: Exposed area to receive fill, backfill, or embankment shall be proofrolled to detect localized zones of excessively wet, unstable, organic, or low bearing capacity materials as follows:
         (1) Proofroll as a single-pass operation with conventional compaction equipment during subgrade preparation and prior to placement of fill, and as a spot check process without the need for complete coverage per unit area of tire. Soft spots shall be overexcavated, backfilled, and compacted with suitable material. Do not over excavate more than 3 feet below finished subgrade elevation.
         (2) Proofroll within limits of proposed construction of footings, slabs, mats, or pavement and to extent of 10 feet beyond proposed exterior walls and stated limits, or as otherwise noted. Proofroll with loaded dump truck, loaded pan scrapper, 15 - ton light class pneumatic tired roller compactor, or equivalent. Ground contact pressure of 80 psi and average speed of 5 miles per hour shall be maintained and continue until extent of soft spots is determined with not less than one pass per unit area of tire. Soft spots shall be overexcavated, backfilled, and compacted with suitable material.
   2. Subgrade for Fills and Embankments: Roughen by discing or scarifying and wet or dry top 6 inches as required to bond with fill or embankment.
   3. Subgrade for Roadways, Drives, Parking Areas:

a. Extend subgrade the full width of pavement or base course, plus 1 foot in each direction.
b. Cohesive Soil Subgrades: Compact the top 6 inches of subgrade for traffic areas and railroads in embankment or excavation to a minimum of 95% of maximum dry density within the moisture content range from 2% below to 2% above optimum as determined by ASTM D698.
c. KDOT AB3 aggregate for granular base should be compacted to not less than 98 percent modified Proctor maximum dry density (ASTM D1557). Treated subgrade should be compacted to not less than 95% of the standard Proctor maximum dry density (ASTM D698) within -2 to +2 percent of the corresponding optimum moisture content.

4. Subgrades for Concrete Slabs on Grade, Mats, and Footings:
   a. Compact cohesive soil subgrades to a minimum of 98% of maximum dry density within the moisture content range from 2% below to 2% above optimum as determined by ASTM D698 for CL, GC, and GW soils. Soils classified as CH shall be compacted to a minimum of 98% of maximum dry density within the moisture content range from 0% to 3% above optimum as determined by ASTM D698.
   b. Where subgrade consists of cohesionless granular materials, compact to not less than 80% relative density as determined by ASTM D4253 and D4254.
   c. Slope subgrade away from foundations to provide positive drainage.

B. Embankments and Fills:
   1. Construct embankments to contours and elevations indicated, using suitable approved material from excavations and borrow areas:
      a. Place fill material in maximum 8-inch loose lifts.
      b. Place embankment only on subgrades approved by Owner.
      c. Do not place snow, ice, or frozen earth in fill; do not place fill on a frozen surface.
   2. Obtain compaction by the controlled movement of compaction equipment approved by Owner during placing and grading of layers and to minimum density specified for indicated locations.
   3. Except as indicated or specified otherwise, compact cohesive soils to a minimum of 95% of maximum dry density within the moisture content range 2% below to 4% above optimum as determined by ASTM D698.
   4. In areas of fill supporting structures or under paved areas, compact cohesive soils to a minimum of 95% of maximum dry density within the moisture content range from 2% below to 4% above optimum as determined by ASTM D698.
   5. Except as indicated or specified otherwise, compact cohesionless soils to not less than 75% relative density as determined by ASTM Method D4253 and D4254.

C. Backfilling:
   1. Backfill for structures and trenches shall be as specified in "Embankments and Fills," this Section, with the following additional provisions:
   2. Structures:
      a. Backfill only after concrete has attained 70% design strength.
      b. Backfill adjacent to structures only after a sufficient portion of structure has been built to resist imposed load.
      c. Remove all debris from excavation prior to placement of material.
      d. Place backfill in level loose lifts of thickness within compacting ability of equipment used but not to exceed 8 inches in thickness.
      e. Perform backfilling simultaneously on all sides of structures.

f. Exercise extreme care in use of heavy equipment in areas adjacent to structures. Equipment operated within 10 feet of any wall shall not exceed 20,000 pounds gross weight.
g. Material above a 45° plane intersecting the footing shall not include rock fragments incapable of passing a 6-inch screen, and no shale whether disintegrated or not.

3. Trenches:
   a. Backfill for trenches shall be as specified for structures and as follows:
      (1) Complete promptly upon completion of pipe embedment and approval to proceed.
      (2) Use hand methods to a plane 12 inches above top of pipe.
      (3) Mechanical methods shall be acceptable where hand backfill is not required.
      (4) Backfill in lifts of thickness within compacting ability of equipment used, but not greater than 8 inches.
      (5) Until compacted depth over conduit exceeds 3 feet, do not drop fill material over 5 feet. Distance may then be increased 2 feet for each additional foot of cover.

3.05 TOPSOILING:

A. Material: Use the most suitable material obtained from stripping operations and borrow when required.
   1. Placement:
      a. Clear areas free of vegetation, rock, and other materials which would interfere with grading and tillage operations.
      b. Blend topsoil to subgrade surface by scarifying the subgrade to a depth of 2 inches.
      c. Spread and grade topsoil to bring areas to grades as indicated, to ensure that all surfaces are left in an even and properly compacted condition, and to prevent ponding.
   2. Cleanup:
      a. Clean surface free of all stones or other objects larger than 2 inches in dimension, all roots, brush, wire, grading stakes, and other objectionable materials.
      b. Keep paved areas clean and ready for seeding or sod as specified.

3.06 RIPRAP:

A. Apply riprap for erosion control where indicated.
B. Subgrade Preparation:
   1. Uniformly trim and dress areas on which geotextile fabric shall be placed, conforming to cross sections indicated.
   2. Fill areas below tolerance limit with suitable material and compact.
   3. Do not place riprap until the subgrade (base) has been accepted by Owner.
C. Placement of Geotextile Fabric:
   1. Place filter fabric within the minimum limits as indicated.
   2. Apply the fabric on the prepared subgrade with proper manufacturer's recommended lapping in a neat manner and properly anchored.
   3. Any damages to the geotextile fabric during installation shall be replaced before proceeding with the riprap placement.
D. Placement of Riprap:
   1. Place stone in a manner to avoid displacing underlying material or damaging the geotextile filter fabric.

2. Place stone on prepared base to produce a reasonably well-graded mass of stone with minimum voids.
3. Place within a tolerance of plus or minus 3 inches from the theoretical slope lines and grades.
4. Finished riprap shall be free from pockets of small stones and clusters of larger stones. Hand-place if necessary to produce an evenly distributed result.
5. Maintain riprap protection until accepted; replace or add any material displaced.

3.07 MAINTENANCE:

A. Protect newly graded and topsoiled areas from actions of the elements.
B. Fill and repair settling or erosion occurring prior to acceptance of the Work, and reestablishes grades to required elevations and slopes.
C. Under provisions of the guarantee, correct any settlement of embankment, fill, or backfill and damages created thereby within 1 year after acceptance of the Work. Make repairs within 10 days after notification by Owner of settlement.

3.08 FIELD QUALITY CONTROL:

A. Compaction:
1. Owner will, through services of an independent laboratory, test all embankments, fills, and subgrades under this Contract to determine conformance with specified density relationships.
2. Method of test may be either of the following at Owner's option:
   a. ASTM D1556
   b. ASTM D2167.
   c. ASTM D6938.
3. The frequency of in-place compaction testing including density and moisture content will be as follows:
   a. At least one test for every 1,000 cubic yards of material placed in a mass fill.
   b. At least one test for every 200 cubic yards of fill placed in trenches or surrounding structures.
   c. At least one test per 1,000 square feet per lift of compacted soil liner or fill in roadbed.
   d. At least one test for every 1,000 square feet of subgrade for fill or soil liner.
   e. At least one test for every 100 feet of roadway for road subgrades and crushed rock base course.
   f. At least one test for every 500 square feet per lift in structural fill or on subgrades for foundations.
   g. At least one test for every shift of compaction operations on a mass fill.
4. At least one test when Owner suspects quality of moisture control or effectiveness of compaction. Remove or scarify fill failing to meet required densities and recompact as necessary to achieve specified results.
5. Removal of in-place material and replacement with approved new material will be required if scarifying and recompaction do not produce the required densities.
6. Perform at least one classification test ASTM D2487 and one moisture-density test ASTM D698 on soil used in fill or backfill operations during construction.
   a. Each sample shall be taken from trenches or other excavations as directed by Owner and should be generally representative of distinguishably differing materials encountered and used for backfill or fill.

b. Perform one set of tests at the beginning of excavation and one additional set of tests when material properties vary (more or less plastic, different color, more or less granular, or other conditions) from the material initially tested.
c. Additional tests shall be performed when directed by Owner.

B. Subgrades:
1. Owner will inspect all subgrades to determine conformance with indicated lines and grades.
2. Subgrades for roadways, drives, parking areas, and railroads shall have a maximum deviation of not more than 1/2 inch in any 10 feet when tested with a 10-foot straightedge applied parallel with and at right angles to centerlines of subgrade areas. Actual grade shall not be more than 0.1 foot from indicated grade.

END OF SECTION 312050

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 321100 - CRUSHED ROCK BASE AND SURFACE COURSE

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes crushed rock base for roads, and yard surfacing course and method of placement.

B. Related Work Specified Elsewhere:

1. SECTION 312050 -- Site Preparation and Earthwork.

1.02 REFERENCES:

A. Applicable Standards:

1. American Society for Testing and Materials (ASTM): Equivalent AASHTO standards may be substituted as approved.
   a. C29 –Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate.
   b. C88 Test Method for Soundness of Aggregates by use of Sodium Sulfate or Magnesium Sulfate.
   c. C117 – Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing.
   d. C131 – Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
   e. C136 – Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   f. D75 – Practice for Sampling Aggregates.
   g. D698 – Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
   h. D2419 – Test Methods for Sand Equivalent Value of Soils and Fine Aggregate.
   i. D3665 – Practice for Random Sampling of Construction Materials.
   j. D4253 - Maximum Index Density of Soils Using a Vibratory Table.
   k. D4254 - Minimum Index Density of Soils and Calculation of Relative Density.
   l. D4318 – Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
   m. D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
2. Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction 2012 (KTCS).

1.03 QUALITY ASSURANCE:

A. Sampling and Testing:

1. Tests to determine conformance with all requirements of this Specification for quality and properties of all Contractor-secured sources of materials shall be performed by an independent commercial laboratory retained and compensated by Contractor and approved by Owner. In lieu of testing, Contractor may submit certified state test results indicating the aggregate meets Specification requirements to Owner for approval.
2. Obtain representative samples of material in accordance with ASTM D75 for testing. Furnish laboratory sufficient material for testing from each sample at the time obtained. Copies of reports and certificates regarding tests and inspection of materials shall be distributed as specified in DIVISION 1. Furnish specific schedule for sampling to provide Owner the opportunity to observe sampling.

3. When incorporating materials into the Work, quality control testing will be performed during construction by a testing laboratory retained and compensated by Owner.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Crushed rock road base and surface course shall consist of the type of aggregate specified herein.

2.02 CRUSHED ROCK BASE:

A. Aggregate shall be crushed stone, or crushed (natural) gravel, free from lumps or balls of clay, dirt, silt, vegetable matter, or other objectionable matter and reasonably free from thin and elongated pieces of aggregate. Aggregates shall consist of angular fragments, durable and sound, and shall be reasonably uniform in density and quality. Fine aggregate passing the No. 4 sieve shall consist of fines from the operation of crushing the coarse aggregate. If necessary, fine aggregate may be added to produce the correct gradation. The fine aggregate shall be produced by crushing stone and gravel that meet the requirements for wear and soundness specified for coarse aggregate.

B. Percentage of wear shall not exceed 50 % when tested in accordance with ASTM C131. The sodium sulfate soundness loss shall not exceed 12% after 5 cycles when tested in accordance with ASTM C88.

C. Portion of aggregate which is retained on a 3/8-inch sieve shall contain 75% by weight of pieces with two or more fractured surfaces if the material is crushed gravel.

D. Portion of aggregate passing No. 40 sieve shall be as follows:
   1. Liquid Limit: Not more than 25 determined by ASTM D4318.
   2. Plastic Index: Not more than 4 determined by ASTM D4318.
   3. The fine aggregate shall have a minimum sand equivalent value of 35 when tested in accordance with ASTM D2419.

E. Gradation for the base course aggregate shall be similar to KCTS No. 57.

2.03 YARD SURFACING COURSE:

A. Aggregate shall be crushed stone, or crushed (natural) gravel, free from lumps or balls of clay, dirt, silt, vegetable matter, or other objectionable matter and reasonably free from thin and elongated pieces of aggregate. Aggregates shall consist of angular fragments, durable and sound, and shall be reasonably uniform in density and quality.

B. Percentage of wear shall not exceed 50 % when tested in accordance with ASTM C131. Soil sterilent should be applied to the existing ground before the crushed rock surfacing is placed. The rock should be well-graded, coarse material with a maximum aggregate size of 1". River run or rounded gravel should not be used.

C. Acceptable gradation for the yard aggregate shall be similar to KCTS No. 67.

2.04 EQUIPMENT:

A. General Requirements:
   1. Maintain all equipment, tools, and machines used in the performance of the Work required by this Section in a satisfactory working condition at all times.
   2. Equipment shall be subject to the approval of Owner.

B. Stationary Mixing Plants:

1. Plants shall be designed to accurately proportion and thoroughly mix the material and water.
2. Plants shall be equipped with weighing and measuring devices for proportioning on a weight basis or by volume based on weight.

C. Steel-Wheeled Rollers shall be self-propelled three-wheeled rollers, two-axle tandem rollers, or three-axle tandem rollers.
1. Rollers shall weigh not less than 8 tons and develop contact pressures under the compression rolls of not less than 200-pounds-per-square-inch width.
2. Three-axle tandem rollers shall be so constructed that when locked in position for all treads to be in one plane, the roller wheels are held with such rigidity that if either front of center wheel is unsupported, the other two wheels will not vary from the plane more than 1/4-inch.
3. Roller wheels shall not have flat areas, openings, or projections.
4. All steel wheels shall be equipped with scrappers, so adjusted to keep the wheels clean at all times.

D. Rubber-Tired Rollers:
1. Rollers shall consist of two axles on which are mounted not less than nine pneumatic-tired wheels, mounted so the rear group of tires do not follow in the tracks of the forward wheels but will be centered between the forward wheels.
2. The axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading.
3. Inflate tires uniformly.
4. May be self-propelled.
5. Tow with pneumatic-tired tractors or other pneumatic-tired equipment.

E. Vibratory Rollers:
1. Have either one or two smooth-surfaced steel drum(s) with a minimum diameter of 42 inches.
2. Have a minimum vibrating force of 300 pounds per cycle per inch of drum width.
3. Have a minimum vibrating frequency of 1,200 cycles per minute and shall be provided with a means of adjusting the resonance of the dynamic force.
4. May be self-propelled or towed.

F. Blade graders shall be self-propelled with a wheelbase of not less than 15 feet, and a blade of not less than 10 feet.

G. Sprinkling equipment shall consist of tank trucks, pressure distributors, or other similar equipment designed to apply water uniformly and in controlled quantities to variable width of surface.

H. Hauling equipment shall consist of pneumatic-tired vehicles and dump bodies suitable for dumping materials in windrows or layers on the subgrade.

I. Tampers shall be mechanical (of an approved type) and hand-operated, weigh not less than 50 pounds, and have a face area of not more than 100 square inches.

J. Miscellaneous equipment shall consist of scarifiers, tractors, spring-tooth or spike-tooth harrows, windrow equalizers, spreaders, and other equipment suitable for construction of select material base course.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS:

A. Stockpiles:
1. Clear and level storage sites prior to stockpiling.

2. Prevent aggregate from segregating during placement, storage, and handling at stockpiles.

B. Cold-Weather Limitations:
   1. Base course construction shall be prohibited when atmospheric temperature is below 35°F, unless approved by writing by Owner.
   2. Do not place base course on frozen subgrade.
   3. Protect base course and subgrade in freezing weather and repair areas damaged by freezing by reshaping and recompacting.

3.02 MIXING AND PLACING OF MATERIALS:

A. If mixing is required, use stationary plant or road-mix method at Contractor's option.

B. Stationary-Plant Method:
   1. Deposit and spread material in a uniform layer and compact to the thickness indicated and as specified below. Spread material uniformly on the prepared subgrade from moving vehicles or spreader boxes.
   2. Level material to the required contour and grades with blade graders.
   3. Remove those portions of the layer which become segregated in spreading and replace with satisfactory mixture or remix as requested by Owner.

C. Road-Mix Method:
   1. Place material without segregation of sizes and spread from spreader boxes or moving vehicles equipped to spread material in layers of uniform thickness.
   2. Mix materials with blade graders, harrows, discs, or other approved equipment. Continue initial mixing until the mixture is uniform throughout.
   3. Add water to the extent necessary to prevent segregation during mixing operations and as needed to meet density requirements.
   4. Add material to the mixture in such amounts and sizes as requested by Owner.

D. Shaping and Compacting Mixed Materials:
   1. Compact in layers no less than 3 inches nor more than 7 inches thick. If the total depth of the compacted material is more than 7 inches, it shall be constructed in two or more layers and each layer shall be of approximately equal thickness.
   2. Roll to specified compaction requirements throughout full depth of layer with vibratory rollers, steel-wheeled rollers, rubber-tired rollers, or combination.
   3. Shape and smooth by blading and rolling with power roller or rubber-tired roller or both.
   4. Hand-tamp in places not accessible to rolling equipment.
   5. Aerate by blade graders, harrows, or other approved equipment when mixture is moistened by rain.

E. Degree of Compaction:
   1. Compaction Testing:
      a. The method of in-place compaction testing shall be as follows if moisture density relationship is attainable:
         (1) Density - ASTM D6938.
         (2) Moisture Content - ASTM D6938.
      b. The minimum frequency of density tests will be as follows:
         (1) At least one test every 100 feet along a roadway or one test every 1,200 square yards of base and surface course placed.
         (2) At least one test when Owner suspects the quality of moisture control or effectiveness of compaction.

2. Base compaction on weight per cubic foot of material passing 3/4-inch sieve and compact each layer to at least 95% of maximum density at plus or minus 2% of the optimum moisture as determined by ASTM D698.
3. Density and moisture content of compacted material shall be measured following the procedures of ASTM D6938. Calibration tests shall be conducted on the first load of material placed that meets density requirements. Calibration checks shall be made at the beginning of the work and at intervals as determined by Owner.
4. Remove or scarify and recompact base course failing to meet required densities.
5. Removal of in-place material and replacement with approved new material will be required if scarifying and recompaction do not produce the required densities.
6. If moisture density relationship is not attainable for the material, use ASTM D4253 and ASTM D4254 to determine the relative density. Compact to a minimum of 80% relative density for the granular material specified.
   a. The minimum frequency of density tests will be as follows:
      (1) At least one test every 100 feet along a roadway or one test every 1,200 square yards of base and surface course placed.
      (2) At least one test when Owner suspects the quality of moisture control or effectiveness of compaction.

F. Smoothness Test:
1. Surface shall show no deviation in excess of 3/8-inch in any 10 feet when tested with a 10-foot straightedge applied parallel with and at right angles to the centerlines of the paved area.
2. Correct any deviation in excess of this amount by loosening, adding or removing material, reshaping, watering, and compacting as requested by Owner. In no case will the addition of thin layers of material be added to the top layer of base course to meet grade. If the elevation of the top layer is 1/2 inch or more below grade, the top layer of base shall be scarified to a depth of at least 3 inches, new material added, and the layer shall be blended and recompacted to bring it to grade. If the finished surface is above plan grade, it shall be cut back to grade and rerolled.

3.03 MAINTENANCE:

A. Maintain finished base course in a moist condition until the next layer is placed and as approved by Owner.

END OF SECTION 321100

DIVISION 33 - UTILITIES

SECTION 331100 - YARD PIPING MATERIAL

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section covers yard piping material in addition to the requirements indicated on the Piping Material Specifications included at the end of this Section.

B. Provide all pipe and fittings required to complete the piping systems.

C. The pipe and fittings required include, but are not limited to, the following:

1. Fittings including unions, pipe bends, backing rings, flanges, bolting materials and couplings.
2. Gaskets.
3. Pipe.

D. Provide one complete set of spare gaskets consisting of at least one gasket of each size, material and pressure rating, but not less than 5% of the total number of gasketed pipe joints for each size, type and pressure rating.

E. Related Work Specified Elsewhere:

1. Yard Piping Installation: SECTION 331150.
2. Field Testing: SECTION 331190.

1.02 REFERENCES:

A. Pipe shall be in conformance with the applicable provisions of the following standards which establish the minimum level of quality required. Equivalent SI units or grades may be used wherever English units are used in this Specification. Exceptions to the following standards have been made throughout these Specifications. When an exception to a standard is specified, the Specifications shall govern.

1. Applicable Standards:

a. American Society of Mechanical Engineers (ASME):

(1) B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges.
(2) B18.2.1 - Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)
(3) B31.1 - Code for Pressure Piping - Power Piping.
(4) B36.10 - Welded and Seamless Wrought Steel Pipe.
(5) B36.19 - Stainless Steel Pipe.

b. American Society for Testing and Materials (ASTM):

(1) A153/A153M - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
(2) A193/A193M - Alloy Steel and Stainless Steel Bolting Materials for High-Temperature Service.
(3) A194/A194M - Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
(4) A307 - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
(5) A563 - Carbon and Alloy Steel Nuts.
(6) D696 - Coefficient of Linear Thermal Expansion of Plastics.
(7) D1248 - Polyethylene Plastics Molding and Extrusion Materials.
(8) D1418 – Rubber and Rubber Lattices-Nomenclature.
(9) D3035 - Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
(10) D3261 - Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.

(11) D3350 - Polyethylene Plastics Pipe and Fittings Materials.
(12) F714 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
(13) F2329 – Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

c. American Water Works Association (AWWA):
(1) C901 – Polyethylene (PE) Pressure Pipe and Tubing, 1/2 inch Through 3 inch for Water Service.
(2) C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 inch Through 63 inch for Water Distribution and Transmission.
(3) M11 - Steel Pipe - Design and Installation.

d. Federal Specifications (FS):
(1) HH-G-156 - Gasket Material, General Purposes; Rubber Sheets, Strips, and Special Shapes.

e. Society for Protective Coatings (SSPC) Surface Preparation Specifications:
(1) SP1 - Solvent Cleaning.
(2) SP3 - Power Tool Cleaning.
(3) SP5 - White Metal Blast Cleaning.
(4) SP6 - Commercial Blast Cleaning.
(5) SP8 - Pickling.
(6) SP10 - Near-White Blast Cleaning.
(7) SP11 - Power Tool Cleaning to Bare Metal.

f. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code:
(1) Section IX - Welding and Brazing Qualifications.

g. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS):
(1) MSS SP6 - Standard Finishes for Contact Faces of Pipe Flanges.
(2) MSS SP44 - Steel Pipe Line Flanges.

h. Underwriters Laboratories, Inc. (UL).

i. Factory Mutual Research Corporation (FM).

1.03 SUBMITTALS

A. Submit as specified in DIVISION 1.

B. Submittals required shall include:
1. Manufacturer's catalog cuts on materials being supplied.
2. Complete details of pipe, fittings, connections, mechanical connections, gaskets, bolting materials, and fabrication procedures.
3. Fusion procedures and certifications.

1.04 QUALITY ASSURANCE:

A. Factory Tests:
1. Conduct manufacturer's standard factory tests and tests required by the applicable codes and standards.

1.05 DELIVERY, STORAGE AND HANDLING:

A. Ship material to the Site and store in assigned laydown areas.

B. Piping and fitting ends shall be closed and taped and shall be stored off the ground on dunnage, pallets, grates, or similar means to keep the material clean and rust free. Ship spare material

separately packaged and tagged as spare parts. Spare part tags shall identify type, size, material, and other related information.

C. Handling and storage shall be in accordance with manufacturer's recommendations and as specified in SECTION 331150.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Provide pipe and fittings required to complete the piping systems.

B. Provide one complete set of spare gaskets consisting of at least one gasket of each size, material and pressure rating, but not less than 5% of the total number of gasketed pipe joints for each size, type and pressure rating.

2.02 POLYETHYLENE PIPE:

A. General:
   1. Shall conform to the material specifications defined on the Piping Material Specifications and as specified.
   2. Pipe shall have steel pipe equivalent outside diameter.
   3. Shall have a Standard Thermoplastic Pipe Dimension Ratio (SDR) ratio of pipe diameter to wall thickness as indicated on the Piping Material Specifications.
   4. Pipe thermal coefficient of thermal expansion shall not exceed 1.2×10^4 in/in/°F as determined by ASTM D696.

B. Fittings:
   1. Shall be fabricated by thermal fusion and have a pressure rating and strength equivalent to adjoining pipe, as defined on the Piping Material Specifications.
   2. Shall be of the same material as the pipe.
   3. If reinforcement is necessary it shall be the same material as the pipe and be monolithic HDPE resin. No fiberglass over-wrapping will be allowed.
   4. Reinforcement for outlets shall be designed in accordance with ASME B31.1.
   5. Reducing tees shall have integral butt fusion outlets. Sidewall fusion is not acceptable.

C. Joints:
   1. Shall be butt fusion, except where flanged joints are indicated or specified.
   2. Flanges shall consist of polyethylene flange adaptors with one of the following back-up rings.
      a. Improved Piping Products, In.: Delta Flex BUP-SDR convoluted flange/backup ring rated for 200 psi working pressure.
      b. ANSI B16.5 Class 150 or Class 250 slip-on steel flange as required.

2.03 FLANGE BOLTING MATERIALS:

A. Flange bolt material shall be as follows:
   1. Heavy Hex Head Bolts shall be provided for drilled and tapped bolt holes of single flange (lugged) valve bodies in accordance with ASME B18.2.1 Square and Hex Bolts and Screws (inch series). Materials of construction shall be per Type as defined on the Pipe Material Specification. Hex Head Cap Screws shall not be galvanized.

B. Coat all nuts and bolts as following:
      a. Galvanized - Fasteners and associated hardware shall be hot-dip galvanized according to ASTM F 2329 or mechanically deposited according to ASTM B695 with average thicknesses defined in the below table, or PTFE or Teflon encapsulated.

ASTM Standard Specification	Fastener and Nuts Size 3/8 inch and smaller	Fastener and Nuts Size Larger than 3/8 inch
F 2329	1.5 mils	1.7 mils
B 695	Class 40	Class 50

2.04 GASKETS:

A. Gaskets shall be as follows:

1. For flat faced and non-metallic flanges:

a. Garlock Sealing Technologies Style 3760 or Engineer acceptable equal.

PART 3 - EXECUTION – Not Applicable.

END OF SECTION 331100

SECTION 331150 - PIPE INSTALLATION

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes handling and installation of all piping, fittings, specials and appurtenances as indicated or as specified.

B. Related Work Specified Elsewhere:
   1. Piping Material: SECTION 331100.
   2. Field Testing: SECTION 331190.

1.02 REFERENCES:

A. Pipe installation shall be in conformance with the applicable provisions of the following standards which establish the minimum level of quality required. Exceptions to the following standards have been made throughout these Specifications. When an exception to a standard is specified, the Specifications shall govern.

B. Applicable Standards:
   1. American Society for Testing and Materials (ASTM):
      a. D2321 - Underground Installation of Flexible Thermoplastic Sewer Pipe.
      b. D2774 - Underground Installation of Thermoplastic Pressure Piping.
      c. D3839 - Underground Installation of Flexible Reinforced Thermosetting Resin Pipe and Reinforced Plastic Mortar Pipe.
      d. D2855 - Practice for making Solvent - Cemented Joints with PVC Pipe and Fittings.
      e. F645 - Guide for Selection, Design and Installation of Thermoplastic Water Pressure Piping Systems.
   2. Federal Specifications (FS):
      a. SS-S-210 - Sealing Compound, Preformed Plastic, For Expansion Joints and Pipe Joints.
   3. American Welding Society (AWS).
   4. American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code:
      a. Section IX - Welding and Brazing Qualifications.
   5. Steel Structures Painting Council (SSPC) Surface Preparation Specifications:
      a. SP3 - Power Tool Cleaning.
      b. SP5 - White Metal Blast Cleaning.
      c. SP6 - Commercial Blast Cleaning.
   6. National Plumbing Code.

1.03 SUBMITTALS:

A. Submit as specified in DIVISION 1.

B. Shall be approved before installation may begin.

C. Submittals required shall include, but are not limited to, the following:
   1. Butt fused joint erection procedures and erector and equipment certification.
   2. Protective marking tape.
   3. Material data sheets on pipe marking tape, polyethylene encasement and field coatings.
   4. Test reports required by code and for coating application.
   5. Methods and procedures for field testing of pipe joints.

1.04 QUALITY ASSURANCE:

A. Procedures and Qualifications:
   1. Butt Fused Joints for Polyethylene Pipe:

a. Butt fused joint erection procedure shall be in accordance with pipe manufacturer's standards and erection equipment.
b. Qualification tests shall be conducted by the pipe manufacturer's erection supervisor. Qualification tests shall include, but is not limited to, erection of butt fused joint test samples.
c. Qualification test and erection equipment shall be certified by the pipe manufacturer's erection supervisor.
d. Butt fused joint erection procedure and certifications shall be submitted to Engineer for approval prior to pipe installation.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. Handle pipe in a manner to ensure installation in a sound and undamaged condition, and in accordance with the manufacturer's recommendations.
B. Do not drop or bump.
C. Use slings, lifting lugs, hooks or other devices designed to protect pipe, joint elements, and coatings.
D. Prevent contact with adjacent units during shipping, moving, and storage.
E. Block all pipe and accessories stored outdoors at least 6 inches above the ground.

PART 2 - PRODUCTS: Specified in each applicable Section.

PART 3 - EXECUTION

3.01 PIPE REPAIR:

A. Pipe damaged during transportation, handling, or installation which, in the opinion of the Engineer, cannot be satisfactorily repaired will be rejected and removed from the jobsite.
B. Pipe not in conformance with the applicable physical dimension and tolerance specifications will be rejected.
C. Pipe which, in the opinion of Engineer, has not been satisfactorily repaired will be rejected.
D. Polyethylene Pipe Repair:
   1. Damaged pipe such as gouges or scratches on the interior or exterior surface will be rejected.
E. Replacement of rejected pipe shall be at Contractor's sole expense.

3.02 CLEANING:

A. Thoroughly clean interior of all pipe, fittings, and joints before installation. Exclude entrance of foreign matter during discontinuance of installation by capping or plugging to a watertight condition at the end of each work day.
B. Prior to final fitting of the system, visually inspect all lines and joints, remove all struts, sweep and/or flush clean to the satisfaction of Engineer. Notify Engineer at least 24 hours in advance of intended closing up of a system.

3.03 EXCAVATION, TRENCHING, BEDDING AND BACKFILLING:

A. Conform to DIVISION 31 requirements and as follows:
   1. Overexcavate unsuitable material as determined by Engineer and backfill to bottom of bedding grade with approved compacted material, at no additional expense to Owner.
   2. Maintain trenches in a dewatered condition from start of trench to completed backfill.
   3. Ensure that the embedment material is carefully worked and compacted under the haunches of the pipe.

4. Place remainder of backfill and compact as specified in DIVISION 31.
5. During compaction, take care to prevent direct contact with the pipe by tools or mechanical equipment and avoid impacting or deflecting the pipe by placement of compaction equipment directly over the pipe.
6. Perform all work under and adjacent to buildings as specified in DIVISION 1.
7. Use sheeting and bracing as needed to protect existing structures and facilities.
8. Take special care when performing work immediately adjacent to existing structures and facilities. Structures and facilities damaged by Contractor's operations shall be replaced by Contractor at no cost to Owner.
9. Provide marking protection for all underground piping.
   a. Marking system shall consist of brightly colored polyethylene tape. Width of tape shall be equal to the diameter of the pipe or 12-inch minimum.
   b. Use metallic foil-backed tape above nonmetallic pipe.
   c. Bury tape 24 inches above the top of the pipeline along the centerline of the pipe.

3.04 INSTALLATION:

A. General:
   1. Utilize equipment, methods, and materials ensuring installation to lines and grades indicated and to within the following tolerances:
      a. For buried pipe:
         (1) Grade: ±1 inch for pressure pipe.
             ±1/2-inch for gravity pipe.
         (2) Alignment: ±2 inches for all pipe.
   2. Do not lay on concrete blocks unless pipe is to receive total concrete encasement.
   3. Lay pipe such that fittings and other appurtenances are at the required locations.
   4. Construct field connections true to line, facing, and position without inducing strain on the pipe, fittings, and equipment.
   5. Accomplish indicated horizontal and vertical curve alignments with bends, bevels, and open joints.
      a. Limit bend radius or polyethylene pipe to 30 times the pipe diameter.
   6. Submit proposed method for transfer of line and grade from control to the Work to the Engineer for review and acceptance.
   7. Brace or anchor as required to prevent displacement after establishing final position.
   8. Perform only when weather and trench conditions are suitable. Do not lay in water.
   9. Make all pipe joints in conformance with manufacturer's recommendations or applicable specifications.
      a. Must be approved by Engineer.
      b. Clean all joint and gasket surfaces.
      c. Use methods and equipment capable of fully homing or making up joints without damage.
   10. Provide all nuts, bolts, gaskets, and like materials required to complete all connections to pipe and equipment that are to be made in this Contract.

B. Polyethylene Pipe:
   1. Contractor shall install polyethylene pipe under the training and direction of an erection supervisor furnished by the pipe manufacturer. The pipe manufacturer's erection supervisor shall remain to the site until the Engineer is satisfied that the Contractor is proficient at installing the pipe. The manufacturer's erection supervisor shall be qualified by training and experience to supervise installation train Contractor on proper installation of the pipe.

2. Install in conformance with ASTM D2774 as modified herein.
3. Visually examine pipe while suspended and before lowering into trench for gouges, scratches, and other defects.
4. Butt fused joints shall be made in accordance with pipe manufacturer's printed instructions using equipment certified by pipe manufacturer.

END OF SECTION 331150

5.0 Pipe:

First Size (NPS)	Second Size (NPS)	SCH/Press Rtg	End Prep	Description	Commodity Option	Note(s)
0.75 - 36		DR 17	PE (ASTM D3035)	Pipe, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), DR 17 per ASTM D3035	Default	

6.0 Fittings:

6.1 *45 Degree Elbow*

First Size (NPS)	Second Size (NPS)	SCH/Press Rtg	End Prep	Description	Commodity Option	Note(s)
0.75 - 8		DR 17	PE (ASTM D3261)	45 Degree Elbow, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Molded per ASTM D3261, DR 17 per ASTM D3035	Default	1

6.2 *45 Deg N-Cut Mitered Elbow*

2 - 8		EDR 17	PE (ASTM F2206)	45 Degree LR Elbow, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710)	Fabricated	1, 4
10 - 36		EDR 17	PE (ASTM F2206)	45 Degree LR Elbow, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710)	Default	1, 4

6.3 *90 Degree Elbow*

0.75 - 8		DR 17	PE (ASTM D3261)	90 Degree Elbow, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Molded per ASTM D3261, DR 17 per ASTM D3035	Default	1

6.4 *90 Deg N-Cut Mitered Elbow*

2 - 8		EDR 17	PE (ASTM F2206)	90 Degree LR Elbow, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710)	Fabricated	1, 4
10 - 36		EDR 17	PE (ASTM F2206)	90 Degree LR Elbow, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710)	Default	1, 4

6.5 *Cap*

0.75 - 8		DR 17	PE (ASTM D3261)	Cap, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Molded per ASTM D3261, DR 17 per ASTM D3035	Default	1
10 - 36		EDR 17	PE (ASTM F2206)	Cap, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.6 *Cross*

0.75 - 36		EDR 17	PE (ASTM F2206)	Cross, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.7 *Lateral*

0.75 - 36		EDR 17	PE (ASTM F2206)	Lateral, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.8 *Lateral - Reducing Lateral*

1 - 36	0.75 - 34	EDR 17	PE (ASTM F2206)	Reducing Lateral, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.9 *Reducer - Concentric Reducer*

1 - 8	0.75 - 6	DR 17	PE (ASTM D3261)	Concentric Reducer, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Molded per ASTM D3261, DR 17 per ASTM D3035	Default	1
10 - 36	8 - 34	EDR 17	PE (ASTM F2206)	Concentric Reducer, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.10 *Reducer - Eccentric Reducer*

1 - 36	0.75 - 34	EDR 17	PE (ASTM F2206)	Eccentric Reducer, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.11 *Tee*

0.75 - 8		DR 17	PE (ASTM D3261)	Tee, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Molded per ASTM D3261, DR 17 per ASTM D3035	Default	1
10 - 36		EDR 17	PE (ASTM F2206)	Tee, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

6.12 *Tee - Reducing Tee*

1 - 36	0.75 - 34	EDR 17	PE (ASTM F2206)	Reducing Tee, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Fabricated with a Pressure Rating Equal to or Greater than DR 17 per ASTM F2206	Default	1

7.0 Valves

7.1 *Butterfly Valve*

First Size (NPS)	Second Size (NPS)	SCH/Press Rtg	End Prep	Description	Commodity Option	Note(s)
3 - 4		AWWA CL150B	FFTBE	Butterfly Valve, AWWA C504 CL150B, Wafer, FFTBE, Cast or Ductile Iron, Lever Operator, Gasket required	Default	

6 - 36		AWWA CL150B	FFTBE	Butterfly Valve, AWWA C504 CL150B, Wafer, FFTBE, Cast or Ductile Iron, Gear Operator w/Side Handwheel Operator, Gasket required	Default	

7.2 *Check Valve*

3 - 12		200 psig	FFFE	Check Valve, Swing, AWWA C508, FFFE, Cast or Ductile Iron, Gasket required	Default	
14 - 24		150 psig	FFFE	Check Valve, Swing, AWWA C508, FFFE, Cast or Ductile Iron, Gasket required	Default	

7.3 *Gate Valve*

3 - 12		200 psig	FFFE	Gate Valve, AWWA C509, FFFE, Cast or Ductile Iron, Gasket required	Default	
3 - 12		200 psig	FFFE	Gate Valve, AWWA C509, FFFE, Cast or Ductile Iron, Post Indicator, Gasket required	Post Indicator	
14 - 36		150 psig	FFFE	Gate Valve, AWWA C509, FFFE, Cast or Ductile Iron, Gasket required	Default	
14 - 36		150 psig	FFFE	Gate Valve, AWWA C509, FFFE, Cast or Ductile Iron, Post Indicator, Gasket required	Post Indicator	

8.0 Flanges

8.1 *Blind Flanges*

First Size (NPS)	Second Size (NPS)	SCH/Press Rtg	End Prep	Description	Commodity Option	Note(s)
2 - 24		CL150	FFFE	Blind Flange, CL150, FFFE, ASTM A105, ASME B16.5	Default	
26 - 36		CL150	FFFE	Blind Flange, CL150, FFFE, ASTM A105, ASME B16.47	Default	

8.2 *Flange*

2 - 36			FFLFE x Loose flange, lap joint (ASTM D3261)	Flange Adapter, PE, HDPE, ASTM D3350 Cell CL of 445474C (PE4710), Molded per ASTM D3261, with Ductile Iron Convoluted Backup Ring drilled to ASME B16.5 CL150, Pressure rating equal to or greater than the piping	Default	2

9.0 Gaskets

First Size (NPS)	Second Size (NPS)	SCH/Press Rtg	End Prep	Description	Commodity Option	Note(s)
2 - 10		150 psig	FFFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		150 psig / CL150	FFFE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		200 psig	FFFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		200 psig / CL150	FFFE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		CL150	FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		CL150	FFFE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		CL150B	FFTBE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
2 - 10		CL150B / CL150	FFTBE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		150 psig	FFFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		150 psig / CL150	FFFE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		200 psig	FFFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		200 psig / CL150	FFFE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		CL150	FFFE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		CL150	FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		CL150B	FFTBE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3
12 - 36		CL150B / CL150	FFTBE / FFLFE	Gasket, CL150, Garlock 3760 or Engineer Approved Equal, 1/16" thick	Default	3

10.0 Bolting

First Size (NPS)	Second Size (NPS)	SCH/Press Rtg	End Prep	Description	Commodity Option	Note(s)
2 - 36		200 psig	FFFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	
2 - 36		CL150B / CL150	FFTBE / FFLFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	

2 - 36		CL150B	FFTBE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	
2 - 36		150 psig / CL150	FFFE / FFLFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	
2 - 36		150 psig	FFFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	
2 - 36		200 psig / CL150	FFFE / FFLFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	
2 - 36		CL150	FFLFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	
2 - 36		CL150	FFFE / FFLFE	ASTM A307 Grade B, carbon steel stud-bolts threaded the entire length for FFFE Joint with 2 ASTM A563-A Heavy Nuts	Default	

11.0 Branch Table

90 Degree Branch Connection Table

BRANCH \ HEADER	36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	3	2	1 1/2	1	3/4
36	T																					
34	E	T																				
32	E	E	T																			
30	E	E	E	T																		
28	E	E	E	E	T																	
26	E	E	E	E	E	T																
24	E	E	E	E	E	E	T															
22	E	E	E	E	E	E	E	T														
20	E	E	E	E	E	E	E	E	T													
18	E	E	E	E	E	E	E	E	E	T												
16	E	E	E	E	E	E	E	E	E	E	T											
14	E	E	E	E	E	E	E	E	E	E	E	T										
12	E	E	E	E	E	E	E	E	E	E	E	E	T									
10	E	E	E	E	E	E	E	E	E	E	E	E	E	T								
8	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T							
6	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T						
4	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T					
3	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T				
2	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T			
1 1/2	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T		
1	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T	
3/4	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	T

45 Degree Branch Connection Table

BRANCH \ HEADER	36	34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	3	2	1 1/2	1	3/4
36	L																					
34	L	L																				
32	L	L	L																			
30	L	L	L	L																		
28	L	L	L	L	L																	
26	L	L	L	L	L	L																
24	L	L	L	L	L	L	L															
22	L	L	L	L	L	L	L	L														
20	L	L	L	L	L	L	L	L	L													
18	L	L	L	L	L	L	L	L	L	L												
16	L	L	L	L	L	L	L	L	L	L	L											
14	L	L	L	L	L	L	L	L	L	L	L	L										
12	L	L	L	L	L	L	L	L	L	L	L	L	L									
10	L	L	L	L	L	L	L	L	L	L	L	L	L	L								
8	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L							
6	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L						
4	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L					
3	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L				
2	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L			
1 1/2	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L		
1	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	
3/4	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

12.0 Notes

1)	Component shall have a pressure rating equal to or greater than DR 17 per ASTM D3035
2)	When joining an adapter to a flanged butterfly valve, the inside diameter of the pipe flange shall be checked for valve disk rotation clearance
3)	The gasket manufacturer shall be consulted to ensure the selected gasket can sustain the bolt load on the flange
4)	IPS 2 to IPS 8 fabricated fittings shall be used to ensure sufficient radius on gravity drain systems which require cleanouts

13.0 Legend

E	Reducing Tee
L	Lateral
PE	Plain End
FFFE	Flat-Face Flanged End
FFLFE	Flat-Faced Lap-Flange End
FFTBE	Flat-Face Thru-Bolted End Without Bolt Holes
T	Tee

SECTION 331190 - FIELD TESTING

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes requirements for field testing of the piping systems specified in this DIVISION 33.

B. Related Work Specified Elsewhere:

1. Piping System Material: SECTION 331100.
2. Pipe Installation: SECTION 331150.

1.02 REFERENCES:

A. Applicable Standards:

1. American Water Works Association (AWWA):
   a. M9 - Installation of Concrete Pipe.
   b. M11 - Design and Installation of Steel Pipe.
   c. C203 - Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
   d. C600 - Installation of Gray and Ductile Cast-Iron Water Mains and Appurtenances.
   e. C601 - Disinfecting Water Mains.
2. National Fire Protection Association (NFPA):
   a. 24 - Standard for Outside Protection.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Submit a list of all equipment and materials proposed for use in flushing and testing to Engineer for review and approval prior to any field flushing or testing.

B. Furnish all required materials and equipment for the flushing and testing of pipelines. Include, but not limited to, the following:

1. Leak Tests and Flushing:
   a. Necessary piping connections.
   b. Test pumping equipment.
   c. Water meter.
   d. Pressure gauge.
   e. Bulkheads, supports, struts, strong backs, etc.
   f. All miscellaneous items required.

C. Submit certified calibration test reports from an independent testing laboratory to Engineer on all gauges, meters, and holiday testers proposed for use in the tests.

2.02 WATER:

A. Water for performing tests on all pipelines shall be coordinated with the Owner. Contractor is responsible for transfer of water from Owner's supply to the point of use.

PART 3 - EXECUTION

3.01 GENERAL:

A. Submit proposed methods and procedures for flushing and testing to Engineer for review and acceptance prior to performing any flushing or testing operations.

B. All flushing and testing operations shall be performed by Contractor in the presence of Engineer. Protect all plant equipment, pipe and structures from damage and leakage during

and after the flushing and testing operations. Damage resulting from leakage or failures of bulkheads, plugs, or supports shall be repaired by Contractor at his expense.

C. Submit lengths and locations of proposed test sections to Engineer for review and acceptance.

D. If any test discloses leakage, Contractor shall, at his expense:
   1. Locate the defective pipe, joint, joints, or holidays.
   2. Submit proposed repair methods and materials to Engineer for review and acceptance prior to making repairs.
   3. Repair.
   4. Repeat the applicable test until the leakage is within the specified allowance.

E. Submit test reports signed by the witnessing Engineer. Test reports shall identify the line, line size, station to station, date, type of test, pressure, and test results.

3.02 FLUSHING:

A. All pipelines 18 inches in diameter and smaller shall be flushed prior to the application of the test as specified this Section.
   1. All systems shall be flushed with water.

B. Water Flushing:
   1. Flush water shall be provided at a flow rate such that velocity in pipeline shall not be less than 2.5 feet per second. For pipe sizes 4 inches through 18 inches, flow rates shall conform to Table 1 of AWWA C601.
   2. Flushing shall continue until discolored discharge water is eliminated as determined by Engineer.
   3. Flush water shall not be discharged into pipe trench. Water shall be disposed of using a method, and in a location, as approved by Owner.

C. Notify Engineer at least 24 hours in advance of intended initiation of flushing operation.

3.03 LEAK TESTING:

A. Leak test vent and drain piping that is vented to the atmosphere by using 6.5 psig pressure or by maintaining a 15-foot water column, applied to the highest point of the line being tested. Any initial service leak test shall be in accordance with paragraph 137.7 of ASME B31.1.

END OF SECTION 331190

Big Rivers ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
225261	0	1

SHIP TO:
R. D. Green Station
9000 HWY 2096
Robards,KY 42452

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR: **INDUSTRIAL CONTRACTORS SKANSKA INC**
PO BOX 208
EVANSVILLE, IN 47702-0208

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 14364	DELIVER TO	DATE OF ORDER/BUYER 06-MAY-14 Toerne, Robert Frank	REVISED DATE/BUYER Toerne, Robert Frank
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6029 888-268-6219	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA BEST WAY POSSIBLE	VENDOR CONTACT/TELEPHONE (812) 464-7304

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO:
ROB TOERNE - HEADQUARTERS
PHONE (270) 844-6029
FAX (888) 268-6219
EMAIL: ROBERT.TOERNE@BIGRIVERS.COM

Terms: Negotiated Terms on File.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	PROVIDE LABOR, MATERIALS AND EQUIPMENT TO CONSTRUCT FOUNDATIONS FOR THE GREEN STATION MATS PROJECT AS PER RFQ GN-14-021, ENGINEERS SPECIFICATION 8220, AND ALL CONFORMED SUBMITTALS.	04-JUN-14	805190	EACH	$ 1.00	$ 805,190.00
2.1	PROVIDE LABOR, MATERIALS AND EQUIPMENT ON A TIME AND MATERIALS BASIS AS DIRECTED BY THE OWNER'S DESIGNATED REPRESENTATIVE.	04-JUN-14	40000	EACH	$ 1.00	$ 40,000.00

TOTAL $ 845,190.00

Robert F. Toerne

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PCM Building Foundations

Mercury and Air Toxics Standard (MATS) Compliance Project

RFQ #BR13160

Table of Contents
RFQ # BR13160

PROJECT SUMMARY

Big Rivers Electric Corporation (Owner) requires the construction of a 17 foot by 27 foot reinforced concrete foundation with grounding grid at the Robert D. Green Generating Station (Green Station) to locate a future Power Control Module (PCM) Building.

1. DEFINITIONS

1.1. "Addenda" - written or graphic changes or interpretations of the Contract Documents issued by Owner prior to the opening of Bids.

1.2. "Administrator" shall mean the Administrator of the Rural Utilities Service of the United States of America and his or her duly authorized representative or any other person in whom or authority in which may be vested the duties and functions which the Administrator is now authorized by law to perform.

1.3. "Agreement" or "Contract" - the written agreement between Owner and Bidder covering the Work to be performed. Other Contract Documents are attached to the Contract and made a part thereof as provided therein.

1.4. "Application for Payment" - the form acceptable to Owner and Engineer which is to be used by Bidder during the course of the Work in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

1.5. "Bid" - the formal offer of the Bidder submitted on the prescribed Bid Form and all information submitted with the Bid that pertains to performance of the Work.

1.6. "Bidder" – Prior to Contract award, "Bidder" is any person, firm, or corporation submitting a Bid for the Work or their duly authorized representative. Upon Contract award, "Bidder" is the person, firm or corporation with whom the Owner has entered into the Contract.

1.7. "Change Order" - a written document recommended by Engineer which is signed by Owner and Bidder and authorizes an addition, deletion, or revision in the Work, or an

adjustment in the Contract Price or the Contract Time or other material provision issued on or after execution of the Contract.

1.8. "Company" – Big Rivers Electric Corporation, also referred to as "BREC", "Big Rivers", or "Owner".

1.9. "Contract" or "Agreement" - the written agreement between Owner and Bidder covering the Work to be performed. Other Contract Documents are attached to the Contract and made a part thereof as provided therein.

1.10. "Contract Documents" - All documents referenced in the table of contents, exhibits, attachments, affidavits, bonds, insurance requirements and documents, releases, Specifications, drawings, and Change Orders or signed amendments issued to the Contract.

1.11. "Contract Time" - the number of days or the dates stated in the Contract Documents for the completion of the Work.

1.12. "Contractor" - is the person, firm or corporation with whom the Owner has entered into the Contract.

1.13. "Date of Contract" - the date on which the Contract is signed and executed by the Owner.

1.14. "Day" or "Days" - a calendar day of 24 hours measured from midnight to the next midnight.

1.15. "DDP" (Delivered Duties Paid) (Incoterms 2000) Point of Delivery - The Contract Price includes all costs of transporting Equipment and Materials to the named Point of Delivery, including but not limited to any duties, permits, and insurance for the full value of the Equipment and Materials being delivered.

1.16. "Defective" - an adjective which when modifying the words Equipment and Materials, or Field Services refers to Equipment and Materials or Field Services

which do not conform to the Contract Documents, or do not meet the requirements of any inspection reference standard, test, or approval referred to in the Contract Documents.

1.17. "Effective Date of the Contract" – the date of Acceptance of Contract by Owner or if approval by the Administrator is required, the date of approval by the Administrator in accordance with RUS Form 198 or RUS Form 200.

1.18. "Engineer" shall mean the Engineer employed by the Owner to provide engineering services for the project and said Engineer's duly authorized assistants and representatives. For this Project, "Engineer" means Burns & McDonnell Engineering Company, Inc. a Missouri Corporation, with offices at 9400 Ward Parkway, Kansas City, Missouri 64114.

1.19. "Equipment" - a product with operational or nonoperational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.20. "Field Services" - services to be furnished by Contractor at the Site as required by the Contract Documents.

1.21. "Final Acceptance" - the Work has progressed to the point where, in the opinion of Owner and Engineer, it is sufficiently complete, in accordance with the Contract Documents.

1.22. "Laws and Regulations"/ "Laws or Regulations" - laws, rules, regulations, ordinances, codes and/or orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

1.23. "Liquidated Damages" – payments which the Contractor shall make to the Owner for the value of damages experienced by the Owner to compensate for additional operational expenses or missed delivery schedules defined within the Contract.

1.24. "Materials" - products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.

1.25. "Notice to Proceed" - the written notice by Owner to Bidder fixing the date on which the Contract Time will commence to run and on which Bidder shall start to perform Bidder's obligation under the Contract.

1.26. "Owner" – Big River Electric Corporation, also referred to as "BREC", "Big Rivers", or "Company".

1.27. "Point of Delivery" – the place designated where the Equipment and Materials are to be delivered, being:

1.27.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

1.28. "Parties" - Owner and Bidder, each of which is individually a "Party".

1.29. "Payment and Cancellation Schedule" - the detailed listing of activities or milestones with an associated payment percentage of the total Contract Price which accurately reflects payment for Work accomplished and cancellation percentage of the total Contract Price which reflects the payment(s) agreed to between the Parties in the event of cancellation. This schedule shall be jointly developed and agreed to by Owner and Contractor.

1.30. "Project" - the total construction of which the Work to be provided under the Contract may be the whole, or a part as indicated elsewhere in the Contract.

1.31. "Reference Drawings" - drawings not specifically prepared for this Contract, but which contain information pertinent to the Work.

1.32. "Samples" - physical examples of Equipment, Materials, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

1.33. "Shop Drawings" - all drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

1.34. "Site", "Job Site" or "Point of Delivery" - the Owner's Station where Equipment is being delivered, being:

1.34.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

1.35. "Specifications" - those portions of the Contract Documents consisting of written technical descriptions of the Work, and covering the Equipment, Materials, workmanship, performance and certain administrative details applicable thereto.

1.36. "Subcontractor" - an individual, firm, or corporation having a direct contract with Contractor to perform a portion of the Work.

1.37. "Submittals" - all Shop Drawings, product data, and Samples which are prepared by Contractor, a Subcontractor, manufacturer or Supplier, and submitted by Contractor to Owner and Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe proper installation, operation, and maintenance, or technical properties.

1.38. "Substantial Completion" - the event when, as determined in Owner's reasonably exercised discretion, (i) erection or installation of the Equipment and Materials furnished under the Contract has been completed by the installing contractor and required Field Services have been furnished, (ii) the Equipment and Materials are operating safely for the purpose of commissioning and startup, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the performance guarantees have been verified by Owner and Engineer and the warranty period has commenced, and (v) Contractor has delivered to Company all operating instructions, maintenance manuals, and warranties.

1.39. "Supplier" - a manufacturer, fabricator, supplier, distributor, material man, or vendor of Bidder or Contractor.

1.40. "Work" - the goods and all services required by the Contract, and includes all labor, Materials, Equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations herein. The Work may constitute the whole or a part of the Project.

1.41. "Force Majeure" - any condition, event or circumstance, including the examples set forth below, but only if, and to the extent (i) such condition, event or circumstance is not within the reasonable control of the Party affected, (ii) such condition, event or circumstance, despite the exercise of reasonable diligence, cannot be prevented, avoided or removed by such Party, (iii) such condition, event or circumstance materially adversely affects the ability of the affected Party to fulfill its obligations under this Agreement, (iv) the affected Party has taken all commercially reasonable precautions, due care and commercially reasonable alternative measures in order to avoid the effect of such condition, event or circumstance on the affected Party's ability to fulfill its obligations under this Agreement and to mitigate the consequences thereof and (v) such condition, event or circumstance is not the result of any failure of such Party to perform any of its obligations under this Agreement. By way of example, such events, conditions and circumstances shall include war, rebellion, sabotage, riots, insurrection, public disorder, fires, floods, volcanic eruption, tidal wave, earthquake, quarantine, explosions or other natural catastrophes or Acts of God, and changes in applicable Laws or Regulations after the Effective Date of the Contract.

2. OVERVIEW

2.1. Big Rivers Electric Corporation (Owner) requires the construction of a 17 foot by 27 foot reinforced concrete foundation with grounding grid at the Robert D. Green Generating Station (Green Station) to locate a future PCM building.

2.2. Robert D. Green Generating Station consists of Unit 1 and Unit 2 which are 250 MW and 242 MW pulverized coal-fired balanced draft natural circulation, wall fired units provided by Babcock & Wilcox in 1976. Both units have two air preheaters and two electrostatic precipitators downstream of the economizers, and two wet FGD scrubbers which run at all times the units are online.

2.3. If any conditions, circumstances or occurrences not covered in the Specification are encountered, or if there are any doubts as to the meaning, please contact the Rob Toerne at (270) 844-6029 or rob.toerne@bigrivers.com. Clarifications or explanations may result in an addendum to the RFQ.

2.4. The Contractor shall abide by the items in this Specification unless Big Rivers agrees in writing to any changes. Changes must be made in the form of a written request.

2.5. Big Rivers Electric Corporation reserves the right to reject any or all Bids, to waive informalities therein and to consider exceptions and clarifications therein in order to determine the lowest and best bid; to reject any or all non-conforming, non-responsive, unbalanced or conditional Bids; to reject the Bid of any Contractor that it would not be in the best interest of the Project to make an award to that Contractor, whether because the Bid is not responsive or the Contractor is unqualified or of doubtful financial ability, or fails to meet any other pertinent standard or criteria established. The Company also reserves the right to negotiate contract terms with the successful Contractor. By submitting a Bid, the Contractor agrees that such procedures will be without liability for any damage or claim brought by the Contractor because of such rejections or procedures, nor will the Contractor seek any recourse of any kind against the Company because of such rejections or procedures. The filing of any Bid in response to this Invitation will constitute an agreement of the Contractor to these conditions.

3. PROPOSAL PREPARATION AND SUBMITTAL

3.1. All bids will be valid for ninety (90) days from the opening of the bid.

3.2. The Bidders must complete and submit all documents identified as submittals within this document including, but not limited to;

a. Big Rivers Submittal Sheet
b. Big Rivers Clarifications and Exceptions Sheet
c. RUS Equal Opportunity Form 270
d. RUS Certification Relating to Lobbying
e. RUS Certification Regarding Debarment Form AD-1048
f. Big Rivers Contractor Safety Credentials Assessment Program
g. Big Rivers New Vendor Information Form
h. IRS Form W-9
i. Project Schedule

3.3. The Bidder may submit a list of any Subcontractors that might be used for this project for pre-approval. The submittal must include experience lists and reference contacts for all proposed Subcontractors.

3.4. Any deviations from or exceptions to the attached Specification, terms and conditions, or the Submittals may impact the evaluation of the Bidder's proposal. If there are no exceptions or clarifications please so indicate on the Clarifications & Exceptions Form. Any exception taken to the Specification must be justified in writing, i.e., safety, reliability, efficiency, and increase or decrease in cost and identified on Clarifications & Exceptions Form.

3.5. Any addenda to this request for quotation (RFQ) shall be signed by the Bidder and will be returned with the proposal.

3.6. The Bidder will submit sufficient information and detail with the bid to permit full understanding and evaluation of the equipment and services being offered.

3.7. The attached Big Rivers Submittal Sheet should be used as the submittal sheet for a firm dollar cost to provide equipment, materials, and services as specified with any additional and/or optional pricing attached thereto. The Bidder may submit alternate bids showing detailed options, however, alternates will be considered only if a complete original bid is submitted.

3.7.1. The Bidder will also provide a cost plus percentage markup for any materials that may be needed and/or hourly rates for additional/emerging work for this Project.

3.8. The proposal may be submitted electronically by email or by post, courier, or hand delivered marked prominently with RFQ-BR13160. Bid Proposal must be received no later than September 16, 2013 by 3:00 p.m. (Central Time). Bid proposals received after this date and time will be returned and will not be considered. The bid proposal shall be submitted to the Big Rivers Supply Chain Department at the following addresses:

3.8.1. Big Rivers Electric Corporation
Attn: Rob Toerne
201 Third Street
Henderson, KY 42420

3.8.2. Rob.Toerne@bigrivers.com

3.8.3. Facsimile transmittal: 888-268-6219

3.9. This inquiry implies no obligation on the part of Big Rivers. The Bidder offers the prices, terms, and delivery freely and without bias.

3.10. All expenses incurred by the Bidder in the development of this bid are the sole responsibility of the Bidder.

3.11. The evaluation methodology that will be used to identify the winning bid includes, but is not limited, to the following four elements: Non-Responsiveness Evaluation, Price Evaluation, Qualification/Certification Evaluation, and Technical Evaluation. The purpose of each element and the process employed in each are described in the following sections.

3.11.1. Non-Responsiveness Evaluation: The Non-Responsiveness Evaluation is designed to identify and eliminate any proposal that has not provided the requested information in a proper format to allow an equitable evaluation to occur or that does not meet the requirements set forth in this RFQ. A bid deemed non-responsive by Big Rivers may be rejected. Bidders are subject to disqualification for such things as failure to submit the proposal on or before the designated time and date. Big Rivers Electric Corporation may, in its discretion, disqualify a bid and drop it from further consideration for failure to submit a complete proposal in the form required or failure to provide additional supporting documentation or any clarification that may be requested by Big Rivers subsequent to the submission of the proposal.

3.11.2. Price Evaluation: The Price Evaluation is designed to identify and eliminate bids which are clearly more expensive than other compliant proposals received. This will be accomplished by ranking the bids, as well as the designated options, against each other according to price. Preliminary estimates of production cost effects, operation and maintenance costs, and other pertinent costs will be made and added to each proposal for evaluation purposes. The evaluation will also include an estimate of the negative impact of deviations or exceptions, if any, to the terms and conditions in the proposed Contract or in other agreements contemplated to be entered into. Big Rivers expects the bid to contain an early payment discount structure which terms will also be part of the evaluation.

3.11.3. Qualification/Certification Evaluation: The Qualification/Certification Evaluation is designed to identify and eliminate bids that clearly demonstrate a lack of understanding or an inability to meet the intended Specification for this project. Big Rivers Electric Corporation requires all on-site contractors to complete the Contractor Certification process before any on-site work is awarded.

3.11.4. Technical Evaluation: The Technical Evaluation will consist of a comprehensive review that considers a number of price and non-price factors.

The goal of the Technical Evaluation is to determine the options that best meet the needs of Big Rivers for this project and technical options which improve the facility's overall cost, reliability and availability.

3.12. The Contractor will, within 3 days after Notice to Proceed, submit a Certificate of Insurance naming Big Rivers Electric Corporation as the holder of the certificate. The certificate will also show Big Rivers Electric Corporation as additional insured. Insurance coverage must meet as a minimum, the insurance requirements as specified in Section 7.21 of this document.

4. SCHEDULE REQUIREMENTS

4.1. The time of completion of the Work is a basic consideration of the Specification. Time is of the essence of this Agreement. The proposal will be based upon beginning the Work no later than the September 27, 2013 and completion of the Work as no later than October 18, 2013. Contractor's preliminary schedule and support requirements must be defined and submitted to Big Rivers for approval. A final, mutually agreed and approved schedule must be met.

4.2. The Contractor will provide a weekly project status update to the designated Big Rivers representative.

4.3. The Contractor will adhere to the schedule. Schedules provided with the proposal or within this Specification may be updated prior to the Project. The Contractor will take any and all actions necessary to ensure scheduled completion.

4.4. The Contractor shall maintain, throughout the duration of the job, a schedule with the work progression of individual job elements. The schedule will be up-dated regularly and will be available to Big Rivers for review at any time. The schedule will be broken down to show individual job elements.

4.5. If at any time during the progress of the Work it is determined that the scheduled completion date cannot be met, Big Rivers reserves the right to take any action it deems necessary to ensure timely completion.

5. PLANT SITE REQUIREMENTS

5.1. Big Rivers is committed to procuring safe results for all Purchase Orders. The Contractor and every on-site employee must be certified through and current with Big Rivers' Contractor Safety Credentials Assessment Program (C-SCAP). Contractor will comply with all applicable OSHA, KOSHA, EPA, Big Rivers' rules or other safety practices, rules and regulations that govern work while on the Big Rivers' sites.

5.1.1. The Contractor's on-site employees will be in compliance with all C-SCAP requirements.

5.1.2. Big Rivers may stop work and/or remove the offending party from the worksite if that party fails to observe safety requirements.

5.2. The Contractor will provide all necessary supervision, labor, job management, materials, tools, equipment and consumables deemed necessary to ensure safe, proper and timely completion of the specified work. The Contractor will provide all necessary personnel protective equipment for each of its employees along with documentation of proper training in the use of said equipment.

5.2.1. The Contractor will protect its own employees and its Sub-contractors' employees and be responsible for their work until the Big Rivers' acceptance of the entire project, and to protect Big Rivers' facilities, property, employees and third parties from damage or injury.

5.3. The Contractor will utilize all of the information presented in this document to be fully prepared to begin work at the specified commencement date and time. The Contractor will ensure that a copy of this document has been reviewed by and is in the possession of the on-site manager.

5.4. The Contractor will ensure that all instructions and emergency warnings can be effectively and immediately communicated to all employees. Unless otherwise

instructed Big Rivers requires that one (1) interpreter be provided for every eight (8) non-English speaking employees.

5.5. The Contractor will inform Big Rivers of any hazardous chemicals that will be transported or used on the plant site. Material Safety Data Sheets (MSDS) must be provided to the Owner's Site safety representative prior to use on the plant site and must be available at all times while on the plant site.

5.6. The Contractor will comply with the latest or amended version of the followings standards and codes, and with any and all other standards and codes that may be applicable:

5.6.1. National Fire Protection Association (NFPA)

5.6.2. National Electrical Code (NEC)

5.6.3. National Electrical Manufacturers Association (NEMA)

5.6.4. Electrical Apparatus Service Association (EASA)

5.6.5. International Electrical Testing Association (NETA)

5.6.6. Factory Mutual (FM)

5.7. The Contractor will notify the designated Big Rivers representative upon completion of each phase of the Work.

5.8. The Contractor will ensure that all discarded material and trash is removed from the site or placed in an approved dumpster.

5.8.1. Big Rivers may provide on-site dumpsters for the disposal of non-hazardous waste material. Debris must not be stacked beyond the top of the dumpster.

5.9. The Contractor will not discharge petroleum products anywhere on the plant site. Fuel, lubrication products and any other liquid consumables stored on-site will be in an appropriate tank or container with proper labeling. Use of the proper container and the Big Rivers' approval of such containers in no way releases the Contractor from its responsibility to clean up any spills, discharges, or other releases.

5.10. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers and promptly repaired or replaced by the Contractor.

5.11. During the project, unanticipated repairs or work may be encountered. If such needs are discovered during the project, they will be communicated to the designated Big Rivers representative by the Contractor's on-site supervisor as soon as possible.

5.12. The Contractor will exercise care in the protection of materials and equipment furnished under this Contract.

5.13. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the Contractor.

6. PLANT SITE SUPERVISION

6.1. The Contractor will designate an on-site contact person with the authority to make decisions, correct problems and generally oversee the Contractor's equipment. In the event the contact person is absent from the job site, an alternate contact person with full authority to make decisions will be available onsite during all activities relating to this project.

6.1.1. There will be a designated Big Rivers representative on site, during day shift, to coordinate work schedules, safety issues, etc.

6.2. The Contractor will provide in writing the name and phone number (office, home, pager and mobile as applicable) of the contact person and the alternate contact person(s) prior to the start of Work hereunder and within one working day of any changes in the previously designated contact person.

6.3. To the extent possible, the on-site contact person will be the same from week to week to ensure job continuity.

6.4. The Contractor will provide an after hours, emergency 24-hour per day contact list. The list will be prioritized as to the order that should be followed in notifying the Contractor.

7. COMMERCIAL TERMS

7.1. Warranties

7.1.1. All Work furnished hereunder shall be subject to the inspection, tests, and approval of the Owner and the Engineer, and the Contractor shall furnish all information required concerning the nature or source of any Equipment and provide adequate facilities for testing and inspecting the Equipment at the plant of the Contractor.

7.1.2. Contractor warrants that:

a. the Work will conform to any applicable Specification; and any materials supplied in connection therewith shall be new, unused, and free from defect;
b. the Work will be suitable for the purposes specified by Company and will conform to each statement, representation, and description made by Contractor to Company;
c. the Work is not and shall not be subject to any encumbrance, lien, security interest, patent, copyright or trademark claims, infringements, or other defects in title; and
d. any labor or services performed pursuant to this Agreement shall be performed in a competent, diligent, and timely manner in accordance with the highest professionally accepted standards.

7.1.3. Contractor shall respond in writing to any warranty claim by Company within five (5) business days of the delivery of notice of such claim to Contractor.

7.2. Materials and Supplies.

In the performance of this Contract there shall be furnished only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States or in any eligible country, and only such manufactured articles, materials, and supplies as have been manufactured in the United States or in any eligible country substantially all from articles, materials, or supplies mined, produced or manufactured, as the case may be, in the United States or in any eligible country; provided that other articles, materials, or supplies may be used in the event and to the extent that the Administrator shall expressly in writing authorize such use pursuant to the provisions of the Rural Electrification Act of 1938, being Title IV of Public Resolution No. 122, 75th Congress, approved June 21, 1938. For the purposes of this section, an "eligible country" is any country that applies with respect to the United States an agreement ensuring reciprocal access for United States products and services and suppliers to the markets of that country, as determined by the United States Trade Representative. The Bidder agrees to submit to the Owner such certificates with respect to compliance with the foregoing provision as the Administrator from time to time may require.

7.3. Conditions of Risk and Work

Unless the applicable Statement of Work expressly provides otherwise, Contractor agrees that before beginning any Work, Contractor shall carefully examine all conditions relevant to such Work and its surroundings, and, unless Contractor notifies Company in writing that it will not perform the Work under such conditions, Contractor shall assume the risk of such conditions and shall, regardless of such conditions, the expense, or difficulty of performing the Work, fully complete the Work for the stated Contract Price applicable to such Work without further recourse to Company. Without limiting the foregoing, Contractor specifically recognizes that Company and other parties may be working concurrently at the site. Information on the site of the Work and local conditions at such site furnished by Company in Specifications, drawings, or otherwise is made without representation or warranty of any nature by Company, is not guaranteed by Company, and is furnished solely for the convenience of Contractor. All drawings and other documents, if any, required to be submitted to Company for review shall be submitted in accordance with the mutually agreed to schedule, and, if no schedule applies, such drawings or other

documents shall be submitted by Contractor without unreasonable delay. No Work affected by such drawings and other documents shall be started until Contractor is authorized to do so by Company. In case of a conflict between or within instructions, Specifications, drawings, schedules, or Purchase Order(s), Company shall resolve such conflict; and Company's resolution shall be binding on Contractor.

7.4. Labor Harmony

Contractor agrees that all labor employed by Contractor, its agents, or subcontractors for Work on the premises of Company shall be in harmony with all other labor being used by Company or other contractors working on Company's premises. Contractor agrees to give Company immediate notice of any threatened or actual labor dispute and will provide assistance as determined necessary by Company to resolve any such dispute. Contractor, its agents, or subcontractors shall remove from Company's premises any person objected to by Company in association with the Work.

7.5. Company Changes in Work

The scope of and conditions applicable to the Work shall be subject to changes by Company from time to time. Such changes shall only be enforceable if documented in a writing executed by Company. Except as otherwise specifically set forth in this Agreement, changes in the scope of or conditions applicable to the Work may result in adjustments in the Contract Price and/or the Work schedule in accordance with this Article. If Contractor believes that adjustment of the Contract Price or the Work schedule is justified, whether as a result of a change made pursuant to this Article or as a result of any other circumstance, then Contractor shall (a) give Company written notice of its claim within five (5) business days after receipt of notice of such change or the occurrence of such circumstances and (b) shall supply a written statement supporting Contractor's claim within ten (10) business days after receipt of notice of such change or occurrence of such circumstances, which statement shall include Contractor's detailed estimate of the effect on the Contract Price and/or the Work schedule. Contractor agrees to continue performance of the Work during the time any claim hereunder is pending. Company shall not be bound to any adjustments in the Contract Price or the Work schedule unless expressly agreed to by Company in writing. Company will not be liable for, and Contractor waives, any claims of

Contractor that Contractor knew or should have known and that were not reported by Contractor in accordance with the provisions of this Article.

7.6. Force Majeure

Neither party shall be liable to the other for any damages for any failure to perform or for any delays or interruptions beyond that party's reasonable control in performing any of its obligations under this Agreement due to Force Majeure, unless the time to perform is expressly guaranteed. Contractor shall advise Company immediately of any anticipated and actual failure, delay, or interruption and the cause and estimated duration of such event. Any such failure, delay, or interruption, even though existing on the date of this Agreement or on the date of the start of the Work, shall require Contractor to within five (5) days submit a recovery plan detailing the manner in which the failure, delay, or interruption shall be remedied and the revised schedule. This Article shall apply only to the part of the Work directly affected by the particular failure, delay, or interruption, and shall not apply to the Work as a whole or any other unaffected part thereof.

7.7. Contractor Delays

Contractor agrees to cooperate with Company in scheduling the Work so that the Project and other activities at Company's site will progress with a minimum of delays. Company shall not be responsible for compensating Contractor for any costs of overtime or other premium time work unless Company has provided separate prior written authorization for additional compensation to Contractor, and, if Company provides such written authorization, such additional compensation shall be limited to Contractor's actual cost of the premium portion of wages, craft fringe benefits, and payroll burdens. Contractor shall be liable for all failures, delays, and interruptions in performing any of its obligations under this Agreement which are not (a) caused by Company and reported in accordance with Article 7.5, (b) excused by Article 7.6, or (c) directed by Company pursuant to Article 7.8. Contractor shall, without adjustment to completion date or Contract Price, be obligated to make up time lost by such failures, delays, or interruptions. Company may suspend payments under this Agreement during the period of any such failure, delay, or interruption.

7.8. Company Extensions

Company shall have the right to extend schedules or suspend the Work, in whole or in part, at any time upon written notice to Contractor (except that in an emergency or in the event that Company identifies any safety concerns, Company may require an immediate suspension upon oral or written notice to Contractor). Contractor shall, upon receipt of such notice, immediately suspend or delay the Work. Contractor shall resume any suspended Work when directed by Company. If Contractor follows the requirements of Article 7.5, a mutually agreed equitable adjustment to the Contract Price or to the schedules for payments and performance of the remaining Work may be made to reflect Company's extension of schedules or suspension of the Work. Contractor shall provide Company all information Company shall request in connection with determining the amount of such equitable adjustment.

7.9. Right of Inspecting and Testing

Company reserves the right, but shall not be obligated, to appoint representatives to follow the progress of the Work with authority to suspend any Work not in compliance with this Agreement. The appointment or absence of an appointment, of such representatives by Company shall not have any effect on warranties. Acceptance or approval by Company's representative shall not be deemed to constitute final acceptance by Company, nor shall Company's inspection relieve Contractor of responsibility for proper performance of the Work. Inspection by Company's representative shall not be deemed to be supervision or direction by Company of Contractor, its agents, servants, or employees, but shall be only for the purpose of attempting to ensure that the Work complies with this Agreement. In the event Contractor fails to provide Company with reasonable facilities and access for inspection when advised, and if in the opinion of Company it becomes necessary to dismantle the Work for such inspection, then Contractor shall bear the expenses of such dismantling and reassembly.

7.10. Right of Auditing

Contractor shall maintain complete records relating to any cost-based (i.e., Work not covered by firm prices) components of the Work billed under this Agreement or relating to the quantity of units billed under any unit price provisions of this Agreement (all the foregoing hereinafter referred to as "Records") for a minimum of

five years following the latest of performance of, delivery to Company of, or payment by Company for, such Work or units. All such Records shall be open to inspection and subject to audit and reproduction during normal working hours, by Company or its authorized representatives to the extent necessary to adequately permit evaluation and verification of any invoices, payments, time sheets, or claims based on Contractor's actual costs incurred in the performance or delivery of Work under this Agreement. For the purpose of evaluating or verifying such actual or claimed costs, Company or its authorized representative shall have access to said Records at any time, including any time after final payment by Company to Contractor pursuant to this Agreement. All non-public information obtained in the course of such audits shall be held in confidence except pursuant to judicial and administrative order. Company or its authorized representative shall have access, during normal working hours, to all necessary Contractor facilities and shall be provided adequate and appropriate work space to conduct audits in compliance with the provisions of this Article. Company shall give Contractor reasonable notice of intended audits. The rights of Company set forth in this paragraph shall survive the termination or expiration of this Agreement.

7.11. Applicable Laws and Safety

Contractor agrees to protect its own and its Subcontractors' employees and be responsible for their Work until Company's acceptance of the entire Project and to protect Company's facilities, property, employees, and third parties from damage or injury. Contractor shall at all times be solely responsible for complying with all applicable Laws and Regulations and facility rules, including without limitation those relating to health and safety, in connection with the Work and for obtaining (but only as approved by Company) all permits and approvals necessary to perform the Work. Without limiting the foregoing, Contractor agrees to strictly abide by and observe all standards of the Occupational Safety & Health Administration (OSHA) which are applicable to the Work and Company's Contractor/Subcontractor safety policy and any other rules and regulations of the Company. Contractor shall maintain the Work site in a safe and orderly condition at all times. Company shall have the right but not the obligation to review Contractor's compliance with safety and cleanup measures. In the event Contractor fails to keep the work area clean, Company shall have the right to perform such cleanup on behalf of, at the risk of and at the expense of

Contractor. Contractor shall require all of its Subcontractors to complete the safety and health questionnaire and checklists provided by Company and shall provide a copy of such documents to Company upon request. Contractor shall conduct, and require its Subcontractors to conduct, safety audits and job briefings during performance of the Work. In the event a Subcontractor has no procedure for conducting safety audits and job briefings, Contractor shall include the Subcontractor in its safety audits and job briefings. All safety audits shall be documented in writing by the Contractor and its Subcontractors. Contractor shall provide documentation of any and all audits identifying safety deficiencies and concerns and corrective action taken as a result of such audits to Company semi-monthly.

7.12. Hazards and Training

Contractor shall furnish trained, qualified, and experienced personnel and appropriate safety and other equipment in first-class condition, suitable for performance of the Work. Such personnel shall be skilled and properly trained to perform the Work and recognize all hazards associated with the Work. Without limiting the foregoing, Contractor shall participate in any safety orientation or other of Company's familiarization initiatives related to safety and shall strictly comply with any monitoring initiatives as determined by Company. Contractor shall accept all equipment, structures, and property of Company as found and acknowledges it has inspected the property, has determined the hazards incident to working thereon or thereabouts, and has adopted suitable precautions and methods for the protection and safety of its employees and the property.

7.13. Drug and Alcohol

No person will perform any of the Work while under the influence of drugs or alcohol. No alcohol may be consumed within four (4) hours of the start of any person's performance of the Work or anytime during the workday. A person will be deemed under the influence of alcohol if a level of .02 percent blood alcohol or greater is found. In addition to the requirements of the drug testing program, as set forth in Company's rules and regulations, all persons who will perform any of the Work will be subject to drug and alcohol testing under either of the following circumstances: (i) where the person's performance either contributed to an accident or cannot be completely discounted as a contributing factor to an accident which

involves off-site medical treatment of any person; and (ii) where Company determines in its sole discretion that there is reasonable cause to believe such person is using drugs or alcohol or may otherwise be unfit for duty. Such persons will not be permitted to perform any Work until the test results are established. Contractor shall be solely responsible for administering and conducting drug and alcohol testing, as set forth herein, at Contractor's sole expense. As applicable and in addition to any other requirements under this Agreement, Contractor shall develop and strictly comply with any and all drug testing requirements as required by applicable Laws or Regulations.

7.14. Status of Contractor

Contractor, in performing the Work, shall not act as an agent or employee of Company, but shall be and act as an independent contractor and shall be free to perform the Work by such methods and in such manner as Contractor may choose, doing everything necessary to perform such Work properly and safely and having supervision over and responsibility for the safety and actions of its employees and the suitability of its equipment. Contractor's employees and Subcontractors shall not be deemed to be employees of Company. Contractor agrees that if any portion of Contractor's Work is subcontracted, all such Subcontractors shall be bound by and observe the conditions of this Agreement to the same extent as required of Contractor.

7.15. Equal Employment Opportunity

To the extent applicable, Contractor shall comply with all of the following provisions, which are incorporated herein by reference: (i) Equal Opportunity regulations set forth in 41 CFR § 60-1.4(a) and (c), prohibiting employment discrimination against any employee or applicant because of race, color, religion, sex, or national origin; (ii) Vietnam Era Veterans Readjustment Assistance Act regulations set forth in 41 CFR § 60-250.4 relating to the employment and advancement of disabled veterans and Vietnam era veterans; (iii) Rehabilitation Act regulations set forth in 41 CFR § 60-741.4 relating to the employment and advancement of qualified disabled employees and applicants for employment; (iv) the clause known as "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged

Individuals" set forth in 15 USC § 637(d)(3); and (v) the subcontracting plan requirement set forth in 15 USC § 637(d).

7.16. Indemnity

Contractor shall indemnify and hold harmless the Company and Engineer and their agents and employees from and against all claims, costs, losses, and damages (including reasonable attorney's fees and court costs) arising from and to the extent of the violation of law, negligence, acts, errors, omissions, or intentional misconduct of Contractor or any firm, entity, or other persons for whose acts or omissions the Contractor is responsible, including any Subcontractors. Company shall indemnify and hold harmless Contractor and its directors, officers, employees, and agents from and against all claims, costs, losses, and damages (including reasonable attorney's fees and court costs) arising from and to the extent of the violation of law, negligence, acts, errors, omissions, or intentional misconduct of Company.

7.17. Environmental Control:

As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200) and certain other applicable Laws or Regulations, Contractor or its Subcontractors shall provide Material Safety Data Sheets ("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Agreement. Contractor and its Subcontractors shall provide Company with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any applicable Laws or Regulations in effect at the worksite. No asbestos or lead containing materials shall be incorporated into any Work performed by Contractor or otherwise left on the Work site without the prior written approval of Company. Contractor and its Subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Agreement is subject to any applicable Laws or Regulations.

7.17.1. Contractor and its Subcontractors shall label hazardous substances and materials and train their employees in the safe usage and handling of such substances and materials as required under any applicable Laws or Regulations.

7.17.2. Contractor and its Subcontractors shall be solely responsible for the management of any petroleum or hazardous substances and materials brought onto the Work site and shall prevent the release of petroleum or hazardous substances and materials into the environment. All petroleum or hazardous substances and materials shall be handled and stored according to Contractor's written Spill Prevention Control and Countermeasures Plan or Best Management Practices Plan as defined under the provisions of the Clean Water Act, as amended, if either such Plan must be maintained pursuant to applicable Laws or Regulations. Contractor shall provide secondary containment for the storage of petroleum or hazardous substances and materials. The prompt and proper clean-up of any spills, leaks, or other releases of petroleum or hazardous substances and materials resulting from the performance of the Work under this Agreement and the proper disposal of any residues shall be Contractor's sole responsibility, but Contractor shall give Company immediate notice of any such spills, leaks, or other releases. Contractor shall be solely responsible for the storage, removal, and disposal of any excess or unused quantities of chemicals and materials which Contractor causes to be brought to the Work site.

7.17.3. Unless Company and Contractor expressly agree otherwise in writing, Contractor and its Subcontractors shall be solely responsible for any wastes generated in the course of the Work, and Contractor shall handle, store, and dispose of such wastes in accordance with any Applicable Laws.

7.18. Contractor's Insurance Obligation: Contractor shall provide and maintain, and shall require any Subcontractor to provide and maintain, the following insurance which shall be primary (and, except with regard to Workers' Compensation), naming Company as additional insured and waiving rights of subrogation against Company and Company's insurance carrier(s), and shall submit evidence of such coverage to Company prior to the start of the Work. Contractor's liability shall not be limited to its insurance coverage.

7.18.1. Contractor shall furnish certificates of insurance, in the name of the Big Rivers Electric Corporation, evidencing insurance coverage of the following types of minimum amounts:

a. Workman's compensation and employer's liability insurance covering all employees who perform any of the obligations under the Contract or Purchase Order, in the amounts required by law. If any employer or employee is not subject to the workers compensation laws of the governing state, then insurance shall be obtained voluntarily to provide coverage to the same extent as though the employer or employee were subject to such laws.

b. Comprehensive general liability insurance covering all operation under the Contract or Purchase Order: bodily injury - $1,000,000 each occurrence and aggregate; property damage - $1,000,000 each occurrence and aggregate. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable. Coverage should include contractual liability, broad form property damage liability, Owner's and Contractor's protective (independent contractor's) liability, products and completed operations hazard, explosion, collapse, and underground property damage hazard.

c. Automotive liability insurance on all motor vehicles used in conjunction with the Contract or Purchase Order, whether owned, nonowned, or hired; bodily injury - $1,000,000 each person and $1,000,000 each occurrence; property damage $1,000,000 each occurrence. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable.

d. Certificates evidencing the insurance coverage's must be furnished before the commencement of Work. If any work to be performed under this Contract or Purchase Order is sublet, the Contractor will be required to furnish proof of insurance from all Subcontractors evidencing equal to or better coverage.

7.18.2. The above policies to be provided by Contractor shall be written by insurance companies which are both licensed to do business in the state where the Work will be performed and either satisfactory to Company or having a Best Rating of not less than A-. These policies shall not be materially changed or canceled except with thirty (30) days written notice to Company from Contractor and the insurance carrier. Evidence of coverage, notification of cancellation or other changes shall be mailed to: Attn: Director, Supply Chain, Big Rivers Electric Corp., P.O. Box 24, Henderson, KY 42419.

7.18.3. Company reserves the right to request and receive a summary of coverage of any of the above policies or endorsements; however, Company shall not be obligated to review any of Contractor's certificates of insurance, insurance policies, or endorsements, or to advise Contractor of any deficiencies in such documents. Any receipt of such documents or their review by Company shall not relieve Contractor from or be deemed a waiver of Company's rights to insist on strict fulfillment of Contractor's obligations under this Agreement.

7.18.4. Contractor shall provide notice of any accidents or claims at the Work site to Company's Manager, Risk Management at Big Rivers Electric Corporation, P.O. Box 24, Henderson, KY 42419 and Company's site safety representative.

7.19. Intellectual Rights and Patents

Contractor shall pay all royalties and license fees which may be payable on account of the Work or any part thereof. In case any part of the Work is held in any suit to constitute infringement and its use is enjoined, Contractor within a reasonable time shall, at the election of Company and in addition to Contractor's obligations under Article 7.19, either (a) secure for Company the perpetual right to continue the use of such part of the Work by procuring for Company a royalty-free license or such other

permission as will enable Contractor to secure the suspension of any injunction, or (b) replace at Contractor's own expense such part of the Work with a non-infringing part or modify it so that it becomes non-infringing (in either case with changes in functionality that are acceptable to Company).

7.20. Release of Liens

Contractor hereby releases for itself and its successors in interest, and for all Subcontractors and their successors in interest, any and all claim or right of mechanics or any other type lien upon Company's or any other party's property, the Work, or any part thereof as a result of performing the Work. Contractor shall execute and deliver to Company such documents as may be required by applicable Laws or Regulations to make this release effective and shall give all required notices to Subcontractors with respect to ensuring the effectiveness of the foregoing release against those parties. Contractor shall secure the removal of any lien that Contractor has agreed to release in this Article within five (5) working days of receipt of written notice from Company to remove such lien. If not timely removed, Company may remove the lien and charge all costs and expenses to Contractor, including without limitation costs of bonding off such lien.

7.21. Assignment of Agreement; Subcontracting

Contractor shall not, by operation of law or otherwise, assign and/or subcontract any part of the Work or this Agreement without Company's written approval. Such approval, if given by Company, shall not relieve Contractor from full responsibility for the fulfillment of any and all obligations under this Agreement. Under any and all circumstances, any permitted assignee of Contractor, whether or not such assignee shall be a division, subsidiary and/or affiliate entity of Contractor, shall also be fully bound by the terms of this Agreement and, furthermore, upon request by Company, each of Contractor and its permitted assignee shall provide sufficient financial information, as determined by Company in its sole discretion, necessary to validate such assignee's credit worthiness and ability to perform under this Agreement.

7.22. Invoices and Effects of Payments

7.22.1. Invoices: In accordance with the Payment and Cancellation Schedule, Contractor shall submit an invoice to Company that complies with this Article. Payments shall be made within thirty (30) days of Company's receipt of Contractor's proper invoice, and, in the event that Company's payment is overdue, Contractor shall promptly provide Company with a notice that such payment is overdue. Contractor's invoices shall designate the Company location which is the responsible party. Such invoices shall reference the Contract / Purchase Order number and shall also show labor, material, taxes paid (including without limitation sales and use taxes, duties, fees, and other assessments imposed by governmental authorities), freight, and all other charges (including without limitation equipment rental) as separate items. All invoices shall be submitted with supporting documentation and in acceptable form and quality to Company's authorized representative. Should Company dispute any invoice for any reason, payment on such invoice shall be made within thirty (30) days of the dispute resolution. Payment of the invoice shall not release Contractor from any of its obligations hereunder, including but not limited to its warranty and indemnity obligations. Invoices shall not be delivered with goods, unless expressly authorized by the Company, but all correspondence and packages related to this Agreement shall reference the Purchase Order / Contract number assigned by Company.

7.22.2. Surcharges: All charges must be pre-approved and referenced within the Purchase Order or Contract. Unapproved charges will not be accepted and will cause the invoice to be rejected and returned. This includes, but is not limited to, surcharges, packing charges, core charges, deposits, and/or any other added costs.

7.22.3. Sales and Use Taxes

a. Projects: If Company provides Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, then Contractor shall not withhold or pay Kentucky sales or use taxes to the

extent such exemption certificate applies to the Work (such exemption does not and shall not apply to any materials consumed by Contractor in performing the Work). If Company does not provide Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, Contractor shall be solely responsible for paying all appropriate sales, use, and other taxes and duties (including without limitation sales or use tax with respect to materials purchased and/or consumed in connection with the Work) to, as well as filing appropriate returns with, the appropriate authorities. To the extent specifically included in the Contract Price, Contractor shall bill Company for and Company shall pay Contractor all such taxes and duties, but Company shall in no event be obligated for taxes and duties not specifically included in the Contract Price or for interest or penalties arising out of Contractor's failure to comply with its obligations under this Section.

b. Goods provided to Big Rivers: The Contractor shall not bill Big Rivers for Kentucky Sales Tax. A Direct Pay Authorization is maintained under Permit # 108814 as per 103 KAR 31:030.

7.22.4. Billing of Additional Work: All claims for payments of additions to the Purchase Order / Contract Price shall be shown on separate Contractor's invoices and must refer to the specific change order or written authorization issued by Company as a condition to being considered for payment.

7.22.5. Effect of Payments/Offset: No payments shall be considered as evidence of the performance of or acceptance of the Work, either in whole or in part, and all payments are subject to deduction for loss, damage, costs, or expenses for which Contractor may be liable under any Purchase Order or set-off hereunder. Company, without waiver or limitation of any rights or remedies of Company, shall be entitled from time to time to deduct from any and all amounts owing by Company to Contractor in connection with this Agreement or any other contract with Company any and all amounts owed by Contractor to Company in connection with this Agreement or any other contract with Company.

7.22.6. Evidence of Payment to Subcontractors: Contractor shall, if requested by Company, furnish Company with a certificate showing names of Contractor's Suppliers and Subcontractors hereunder, and certifying to Company that said Suppliers and Subcontractors have been paid in full.

7.23. Term and Termination

7.23.1. This Agreement shall commence upon the issuance of Purchase Order referencing this Specification, the Bidder's Proposal, and any subsequent negotiations and shall survive in full force and effect until terminated as set forth below. A termination under this Article based on certain Work shall only apply to the Purchase Order that covers such Work. Any purchase orders that do not relate to such Work shall not be affected by such a termination.

7.23.2. Termination for Contractor's Breach:
If the Work to be done under this Agreement shall be abandoned by Contractor, if this Agreement or any portion thereof shall be assigned by operation of law or otherwise without the written permission of the Company, if the Work or any portion thereof is sublet by Contractor without the written permission of Company, if Contractor is placed in bankruptcy, or if a receiver be appointed for its properties, if Contractor shall make an assignment for the benefit of creditors, if at any time the necessary progress of Work is not being maintained, or if Contractor is violating any of the conditions or terms of this Agreement, or has executed this Agreement in bad faith, Company may, without prejudice to any other rights or remedies it may have as a result thereof, notify Contractor to discontinue any or all of the Work and terminate this Agreement in whole or part. Company's foregoing right to notify Contractor and terminate this Agreement is subject to Company first providing Contractor with (i) notice and (ii) 30 days' chance to cure any such defect, failure, breach or improper performance. In the event that Section 365(a) of the Bankruptcy Code or some successor law gives Contractor as debtor-in-possession the right to either accept or reject this Agreement, then Contractor agrees to file an appropriate motion with the Bankruptcy Court to either accept or reject this Agreement within twenty (20) days of the entry of the Order for

Relief in the bankruptcy proceeding. Contractor and Company acknowledge and agree that said twenty (20) day period is reasonable under the circumstances. Contractor and Company also agree that if Company has not received notice that Contractor has filed a motion with the Bankruptcy Court to accept or reject this Agreement within said twenty (20) day period, then Company may file a motion with the Bankruptcy Court asking that this Agreement be accepted or rejected, and Contractor shall not oppose such motion.

7.23.3. Effect of Termination for Contractor's Breach:

From the effective date of such termination notice, Contractor shall vacate the site, whereupon Company shall have the right but not the obligation to take possession of the Work wherever located, and Contractor shall cooperate with Company and cause Contractor's Subcontractors to cooperate with Company so that Company can effect such possession. In obtaining replacement services, Company shall not be required to request multiple bids or obtain the lowest figures for completing the Work and may make such expenditures as shall best accomplish such completion and are reasonable given the circumstances. The expenses of completing the Work in excess of the unpaid portion of the Contract Price, together with any damages suffered by Company, shall be paid by Contractor, and Company shall have the right to set off such amounts from amounts due to Contractor.

7.23.4. Termination for Company's Convenience:

Company may terminate this Agreement or one or more purchase orders in whole or in part for its own convenience by thirty (30) days' written notice at any time. In such event, Company shall pay Contractor all direct labor and material costs incurred on the Work that is subject to such termination prior to such notice, plus any reasonable unavoidable cancellation costs which Contractor may incur as a result of such termination, plus indirect costs or overhead on the portion of the Work completed, computed in accordance with generally accepted accounting principles less salvage value. As an alternative to salvage value reduction, Company shall have the right in its sole discretion to take possession of all or part of the Work.

7.24. Publicity

Contractor shall not issue news releases, publicize or issue advertising pertaining to the Work or this Agreement without first obtaining the written approval of Company.

7.25. Confidential Information

All information relating to the Work or the business of Company, including, but not limited to, drawings and specifications relating to the Work, and customer information, shall be held in confidence by Contractor and shall not be used by Contractor for any purpose other than for the performance of the Work or as authorized in writing by Company. In the event that the Contractor assigns the work to one or more Subcontractors, a signed confidentiality agreement between the Contractor and each Subcontractor(s) will be provided to the Company prior to the provision of any information described in the immediately preceding sentence or the performance of any Work by the Subcontractor. All drawings, specifications, or documents furnished by Company to Contractor or developed in connection with the Work shall either be destroyed or returned to Company (including any copies thereof) upon request at any time.

7.26. Miscellaneous

7.26.1. No waiver by Company of any provision herein or of a breach of any provision shall constitute a waiver of any other breach or of any other provision.

7.26.2. Headings: The headings of Articles, Sections, paragraphs, and other parts of this Agreement are for convenience only and do not define, limit, or construe the contents thereof.

7.26.3. Severability: If any provision of this Agreement shall be held invalid under law, such invalidity shall not affect any other provision or provisions hereof which are otherwise valid.

7.26.4. State Law Governing Agreement: This Agreement shall be governed by, and construed in accordance with, the laws of the Commonwealth of Kentucky, without regard to its principles of conflicts of laws.

7.26.5. Enforcement of Rights: Company shall have the right to recover from Contractor all expenses, including but not limited to fees for and expenses of inside or outside counsel hired by Company, arising out of Contractor's breach of this Agreement or any other action by Company to enforce or defend Company's rights hereunder.

7.26.6. No Third Party Beneficiaries: Except for Contractor and Company, there are no intended third party beneficiaries of this Agreement and none may rely on this Agreement in making a claim against Company.

8. NOTICES

All notices and communications respecting this Agreement shall be in writing, shall be identified by the contract number, and shall be addressed as follows (which address either party may change upon five (5) days prior notice to the other party).

To Company:	To Contractor:
Big Rivers Electric Corp.	_____
Attn: Director, Supply Chain	_____
P.O. Box 24	_____
Henderson, Kentucky 42419	_____

8.1. Any notice, request, or approval or other document required or permitted to be given under this Contract will be in writing unless otherwise provided herein and will be deemed to have been sufficiently given if delivered in person, transmitted by fax followed by a hard copy, dispatched in the U.S. mails, postage prepaid for mailing by certified or registered mail, return receipt requested, or dispatched for delivery by other courier service providing a return receipt.

9. TECHICAL SPECIFICATION

9.1 DRAWINGS

A. The following drawings are attached and define all work to be performed:

1. 73827-SB0100.pdf
2. 73827-SB0101.pdf
3. EP001.pdf

9.2 GENERAL

A. CONTRACTOR SHALL COORDINATE ALL STRUCTURAL WORK WITH WORK SHOWN ON ALL OTHER DRAWINGS.

B. CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING CONSTRUCTION AND REPORT ANY DISCREPANCIES FROM THE CONTRACT OR REFERENCE DRAWINGS TO THE ENGINEER PRIOR TO COMMENCING WITH WORK. SCALING OF WORKING DIMENSIONS FROM THE STRUCTURAL DRAWINGS IS PROHIBITED,

C. CONTRACT DRAWINGS REPRESENT THE FINISHED STRUCTURE. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, SHORING AND TEMPORARY BRACING. CONTRACTOR SHALL UNDERTAKE All NECESSARY MEASURES TO ENSURE SAFETY OF ALL PERSONS AND STRUCTURES AT THE SITE AND ADJACENT TO THE SITE. VISITS TO THE SITE BY THE OWNER OR THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF SUCH RESPONSIBILITY.

D. IF CERTAIN FEATURES ARE NOT FULLY SHOWN OR CALLED FOR ON THE CONTRACT DRAWINGS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS FOR SIMILAR CONDITIONS THAT ARE SHOWN OR CALLED FOR, WITH THE APPROVAL OF THE ENGINEER. WHERE SECTIONS VARY, CONTRACTOR SHALL PROVIDE FOR SMOOTH TRANSITIONS BETWEEN THEM, UNLESS NOTED OTHERWISE.

E. ALL PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS' WRITTEN INSTRUCTIONS AND RECOMMENDATIONS, UNLESS NOTED OTHERWISE.

9.3 DESIGN STANDARDS

STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH:

A. 2007 KENTUCKY BUILDING CODE

B. ACI 318-05, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

9.4 GEOTECHNICAL INFORMATION

A. SITE PREPARATION

1. CONTRACTOR SHALL NOTIFY THE OWNER WHEN LOOSE OR SOFT SOILS ARE EXPOSED WHERE SLABS, MATS, OR FOOTINGS ARE TO BE PLACED SO THAT A DETERMINATION MAY BE MADE REGARDING IMPROVEMENT OF THIS POTENTIALLY UNDESIRABLE CONDITION.
2. REMOVE ALL PAVEMENT, SLABS, DEBRIS, VEGETATION, TOPSOIL, AND ORGANIC SOILS FROM STRUCTURE FOOTPRINT.
3. OVEREXCAVATE AS NECESSARY TO REMOVE ALL NON-ENGINEERED FILL, AND SOFT OR LOOSE SOILS.
4. REPLACE OVEREXCAVATED MATERIAL WITH CONTROLLED STRUCTURAL FILL. CONTROLLED FILL SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT.
5. SCARIFY AND RECOMPACT THE SUBGRADE FOR SLABS-ON-GRADE TO A DEPTH OF 6" BELOW THE BASE OF SLAB. FOR COHESIVE MATERIALS COMPACT SUBGRADE TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT. FOR COHESIONLESS MATERIALS, COMPACT SUBGRADE TO AT LEAST 85% RELATIVE DENSITY IN ACCORDANCE WITH ASTM D4253104254.

B. EXCAVATION AND BACKFILL

1. SUITABLE FILL MATERIAL: MATERIALS SUITABLE FOR USE AS FILL INCLUDE MATERIAL FREE OF DEBRIS, ROOTS, ORGANIC MATTER, AND FROZEN MATTER; AND FREE OF STONE HAVING ANY DIMENSION GREATER THAN 2 INCHES.

a. COHESIONLESS MATERIALS INCLUDE GRAVELS, GRAVEL-SAND MIXTURES, SANDS, AND GRAVELLY SANDS EXCLUSIVE OF CLAYEY MATERIAL:
   (1) FREE-DRAINING.
   (2) MATERIALS FOR WHICH IMPACT COMPACTION WILL NOT PRODUCE A WELL-DEFINED, MOISTURE- RELATIONSHIP CURVE.
   (3) MAXIMUM DENSITY BY IMPACT METHODS WILL GENERALLY BE LESS THAN BY VIBRATORY METHODS.
   (4) FOR WHICH GENERALLY LESS THAN 15% BY DRY WEIGHT, OF SOIL PARTICLES PASS THE NO. 200 SIEVE.

b. COHESIVE MATERIALS INCLUDE SILTS AND CLAYS GENERALLY EXCLUSIVE OF SANDS AND GRAVEL FOR WHICH IMPACT COMPACTION WILL PRODUCE A WELL-DEFINED, MOISTURE-DENSITY RELATIONSHIP CURVE.

2. UNSUITABLE FILL MATERIAL: MATERIALS UNSUITABLE FOR USE AS FILL INCLUDE ALL MATERIAL THAT CONTAINS DEBRIS, ROOTS, ORGANIC MATTER, FROZEN MATTER, GRAVEL, STONE, OR SHALE PARTICLES (WITH ANY DIMENSION GREATER THAN 2 INCHES), OR OTHER MATERIALS THAT ARE DETERMINED BY ENGINEER TO BE TOO WET OR OTHERWISE UNSUITABLE FOR PROVIDING A STABLE SUBGRAOE OR STABLE FOUNDATION FOR STRUCTURES.
3. BORROW MATERIALS SHALL NOT EXHIBIT CHARACTERISTICS OF HIGH SHRINK-SWELL POTENTIAL AS DETERMINED FROM ATTERBERG LIMIT TESTS (ASTM D4318) AND/OR SWELUPRESSURE TESTS (ASTM D4546).
4. FOR SOILS USED BELOW STRUCTURAL ELEMENTS, SUCH AS FOOTINGS, SLABS, PAVEMENTS, AND MATS, THAT PORTION OF MATERIAL PASSING THE NO. 40 SQUARE-MESH SIEVE SHALL HAVE A LIQUID LIMIT NOT EXCEEDING 40 AND A PLASTICITY INDEX NOT EXCEEDING 25 WHEN TESTED IN ACCORDANCE WITH ASTM D4318.
5. MATERIAL SHALL BE SUBJECT TO APPROVAL OF ENGINEER.

9.5 MATERIALS

A. REINFORCED CONCRETE

1. REINFORCED CONCRETE SHALL BE PREPARED AND PLACED IN ACCORDANCE WITH ACI MANUAL OF CONCRETE PRACTICE.
2. CONCRETE
   a. UNLESS NOTED OTHERWISE: MINIMUM 28-DAY COMPRESSIVE STRENGTH F'c = 4000 PSI, NORMAL WEIGHT.
   b. SLABS ON GRADE: MINIMUM 28-DAY COMPRESSIVE STRENGTH F'c= 4000 PSI, NORMAL WEIGHT.
   c. MAXIMUM WATER CEMENT RATIO 0.42.
   d. AIR CONTENT 6% +/- 1.5%. TEST AIR ENTRAINMENT IN ACCORDANCE WITH ASTM C231.
   e. AGGREGATE SHALL CONFORM TO ASTM C33. AGGREGATE SHALL BE FROM AN APPROVED SERVICE RECORD OF 3 YEARS WITH A HISTORY INDICATING THAT THE FINE AGGREGATE IS NOT CHEMICALLY REACTIVE.
   f. MAXIMUM AGGREGATE SIZE ¾".
   g. FLY ASH IF UTILIZED SHALL CONFORM TO ASTM C618 CLASS F.
   h. CEMENT SHALL CONFORM TO ASTM C150 TYPE II.
   i. FINENESS MODULUS SHALL BE BETWEEN 2.3 AND 3.1.
   j. WATER REDUCING ADMIXTURE SHALL CONFORM TO ASTM C494, TYPE A. ADMIXTURES SHALL NOT CONTAIN ANY CHLORIDE IONS.
   k. AIR ENTRAINING ADMIXTURE SHALL CONFORM TO ASTM A260. ADMIXTURES SHALL NOT CONTAIN ANY CHLORIDE IONS.
   l. MIX PROPORTIONS FOR ALL CONCRETE SHALL BE BASED ON FIELD EXPERIENCE PER ACI-318.
   m. CONCRETE CURING AGENT SHALL CONFORM TO ASTM C309. TYPE 1-D.
   n. PLACING OF CONCRETE SHALL CONFORM TO ACI 304R.
   o. CONSOLIDATION OF CONCRETE SHALL CONFORM TO ACI 309R.
   p. CONCRETE SLAB ON GRADE SHALL HAVE BROOM FINISH.
   q. CURE CONCRETE CONFORMING TO ACI 308.1.
   r. COLD WEATHER CONCRETING SHALL CONFORM TO ACI 306R.

s. CONCRETE TEST CYLINDERS SHALL BE TAKEN FOR EACH 250 CUBIC YARDS OF CONCRETE PLACED, OR FRACTION THERE OF PER DAY. TEST CYLINDERS AND CONCRETE COMPRESSIVE TESTING SHALL CONFORM TO ASTM C31 ANDC39.

t. CONCRETE TESTING LABORATORY SHALL BE APPROVED BY OWNER.

u. CONCRETE SUPPLIER AND MIX DESIGN SHALL BE APPROVED BY ENGINEER.

v. CONCRETE READY MIX TRUCKS SHALL CONFORM TO TRUCK MIXER MANUFACTURERS BUREAU (TMMB). TRUCK MIXER, AGITATOR AND DISCHARGE CONCRETE CARRIER STANDARDS.

3. FORMWORK

a. CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, ENGINEERING, STRUCTURAL ADEQUACY, AND CONSTRUCTION OF ALL CONCRETE FORMWORK.

b. PROVIDE 3/4" CHAMFER STRIPS ON ALL EDGES OF EXPOSED CONCRETE, UNLESS NOTED OTHERWISE.

c. CONCRETE FQRMWORK CONSTRUCTION SHALL CONFORM TO ACI 301, 318 AND 347.

d. CONSTRUCT AND MAINTAIN FORMS TO THE TOLERANCES GIVEN IN ACI 117.

4. REINFORCING STEEL

a. BARS: ASTM A615 GRADE 60

b. CONTRACTOR SHALL DETAIL AND PLACE ALL REINFORCEMENT IN ACCORDANCE WITH ACI SP-66, ACI 301, ACI 318, AND CRSI MANUAL OF STANDARD PRACTICE.

c. MINIMUM CONCRETE CLEAR COVER OVER REINFORCEMENT SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

(1) CONCRETE CAST AGAINST AND EXPOSED TO EARTH: 3".

(2) CONCRETE EXPOSED TO EARTH OR WEATHER: #6 THROUGH #11 BARS - 2"

#5 AND SMALLER BARS, WELDED WIRE FABRIC – 1 ½"

(3) CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH THE GROUND: SLABS AND WALLS -1"

BEAMS AND COLUMNS, PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS – 1 ½".

d. EMBEDMENT AND LAP SPLICE LENGTHS: SEE TYPICAL REINFORCING DEVELOPMENT AND SPLICING DETAILS THIS DRAWING.

e. FABRICATE COLD BENDS CONFORMING TO ACI 318. FABRICATE BARS IN ACCORDANCE WITH TOLERANCES ACCORDING TO ACI 117.

f. REINFORCING STEEL SHALL BE MARKED WITH METAL OR PLASTIC TAGS FOR IDENTIFICATION MATCHING SHOP DRAWINGS.

g. SUBMIT REINFORCING STEEL SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

h. CONCRETE ACCESSORIES SHALL CONFORM TO ACI SP-66 AND THE CRSI MANUAL OF STANDARD PRACTICE.

Exhibit A

Big Rivers Electric Corporation
Submittal Form
RFQ #HDQ-13-160

PROPOSAL

The Bidder agrees to perform the all work described in this specification and other attached documents for the following firm lump sum price:

Green Station PCM Building Foundation

Labor	$
Equipment	$
Materials	$
Total Price	**$**

☐ **TIME AND MATERIALS RATE SHEET ATTACHED**

☐ **ADDENDA ACCEPTANCE** (ATTACHED)

☐ NOT APPLICABLE

☐ **EXCEPTIONS & CLARIFICATIONS** (ATTACHED)

☐ NOT APPLICABLE

Included	Previously Submitted	
☐	☐	**General Services Agreement**
☐	☐	**Contractor Safety Credentials Assessment Program Forms**
☐	☐	**Equal Opportunity, Debarment, & Lobbying Forms**
☐	☐	**Vendor Information & W-9 Forms**

Company Name	Printed Name	Signature	Date

Exhibit B

Big Rivers
ELECTRIC CORPORATION
Your Touchstone Energy Cooperative

BID CLARIFICATIONS AND/OR EXCEPTIONS

Bidder offers the following clarifications and/or exceptions taken to any requirement or provision of this Request For Quotation and any proposed modifications or replacement language for each clarification or exception (If none, so state)

Bidder understands that unless itemized above, no other clarifications or exceptions to this Request for Quotation are taken by the Bidder.

_____
Bidder

_____
Signature of Executing Party

_____
Date

Exhibit C

EQUAL OPPORTUNITY ADDENDUM
To Be Inserted in Construction Contracts and
Subcontracts, and Materials Contracts and Purchase Orders

PART I

The Contractor represents that:

It has☐ does not have☐, 100 or more employees, and if it has, that

It has☐, has not☐, furnished the Equal Employment Opportunity -- Employers Information Report EEO-l. Standard Form 100, required of employers with 100 or more employees pursuant to Executive Order 11246 and Title VII of the Civil Rights Act of 1964.

The Contractor agrees that it will obtain, prior to the award of any subcontract for more than $10,000 hereunder to a subcontractor with 100 or more employees, a statement, signed by the proposed subcontractor, that the proposed subcontractor has filed a current report on Standard Form 100.

The Contractor agrees that if -it has 100 or more employees and has not submitted a report on Standard Form 100 for the current reporting year and that if this contract will amount to more than $10,000, the Contractor will file such report, as required by law, and notify the Owner in writing of such filing prior to the Owner's acceptance of this Proposal.

PART 11

CERTIFICATION OF NONSEGREGATED FACILITIES

The Contractor certifies that it does not maintain or provide for its employees any segregated facilities at any of its -establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Contractor agrees that a breach of this certification is a. violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest-rooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or. are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Contractor agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that it will retain such certifications in its files.

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

PART III

EQUAL OPPORTUNITY CLAUSE

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race,

color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following 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.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) 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.

(5) 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 its books, records and accounts by the administering agency and the Secretary of Labor for purposes of investi - gation to ascertain compliance with such rules, regulations and orders.

(6) In the event of the Contractor's noncompliance with- the nondiscrimination clauses of this contract or with any of the said rules regulations or orders, this contract may be canceled, terminated or suspended in whole- or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized.in Executive Order 11,246 of September 24, 1965, and such ocher sanctions may be imposed and remedies invoked as provided in the said Executive Order or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) 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 cc vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for 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 administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The term "Contractor" shall also mean "Bidder" or " Seller" in case of materials and equipment contracts and purchase orders. and "Subcontractor" in the case of subcontracts.

The provisions of this addendum are not applicable to any. contract or subcontract not exceeding $10,000.

This addendum supersedes the similar representations and provisions which may be contained in the contract form to which this addendum is attached. The Contractor may disregard the superseded representations and provisions.

_____
CONTRACTOR

By _____

_____
TITLE

_____
DATE

RUS FORM 270 REV 7-70

Exhibit D

UNITED STATES DEPARTMENT OF AGRICULTURE

NOTICE TO APPLICANTS - CERTIFICATION/DISCLOSURE REQUIREMENTS RELATED TO LOBBYING

Section 319 of Public Law 101-121 (31 U.S.C.), signed into law on October 23, 1989, imposes new prohibitions and requirements for disclosure and certification related to lobbying on recipients of Federal contracts, grants, cooperative agreements, and loans. Certain provisions of the law also apply to Federal commitments for loan guarantees and insurance; however, it provides exemptions for Indian tribes and tribal organizations.

Effective December 23, 1989, current and prospective recipients (and their subtier contractors and/or subgrantees) will be prohibited from using Federal funds, other than profits from a Federal contract, for lobbying Congress or any Federal agency in connection with the award of a particular contract, grant, cooperative agreement or loan. In addition, for each award action in excess of $100,000 (or $150,000 for loans) on or after December 23, 1989, the law requires recipients and their subtier contractors and/or subgrantees to: (1) certify that they have neither used nor will use any appropriated funds for payment to lobbyists; (2) disclose the name, address, payment details, and purpose of any agreements with lobbyists whom recipients or their subtier contractors or subgrantees will pay with profits or **nonappropriated** funds on or after December 23, 1989; and (3) file quarterly updates about the use of lobbyists if materials changes occur in their use. The law establishes civil penalties for noncompliance.

If you are a current recipient of funding or have an application, proposal, or bid pending as of December 23, 1989, the law will have the following immediate consequences for you:

- You are prohibited from using appropriated funds (other than profits from Federal contracts) on or after December 23, 1989, for lobbying Congress or any Federal agency in connection with a particular contract, grant, cooperative agreement, or loan;

- you are required to execute the attached certification at the time of submission of an application or before any action in excess of $100,000 is awarded; and

- you will be required to complete the lobbying disclosure form if the disclosure requirements apply to you.

Regulations implementing Section 319 of Public Law 101-121 have been published as an Interim Final Rule by the Office of Management and Budget as Part III of the February 26, 1990, **Federal Register** (pages 6736-6746).

UNITED STATES DEPARTMENT OF AGRICULTURE

CERTIFICATION REGARDING LOBBYING - CONTRACTS, GRANTS, LOANS AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement;

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions;

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Organization Name | Award Number or Project Name

Name and Title of Authorized Representative

Signature | Date

Exhibit E

U.S. DEPARTMENT OF AGRICULTURE

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION - LOWER TIER COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017, Section 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it not its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name | PR/Award Number or Project Name

Name(s) and Title(s) of Authorized Representative(s)

Signature(s) | Date

Form AD-1048 (1/92)

Instructions for Certification

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later than determined that the prospective lower tier participant knowingly
rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transactions," debarred," "suspended," "ineligible,", "lower tier covered transactions," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Form AD-1048

Exhibit F

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

Contractor Safety Credentials Assessment Program

(C-SCAP)

Document 3.0
Big Rivers Electric Corporation Contractor Safety Rules

Company Name: _____

Address: Street/PO Box _____ City _____ State _____ Zip _____

Contact Person Name (Authorized Representative)	Signature	Email	Phone
_____	_____	_____	_____

(If someone other than the "Contact Person" is to receive the C-SCAP pocket card template, please provide the following)

Name: _____ **Email:** _____ **Phone:** _____

Big Rivers Electric Corporation (BREC) is committed to: maintaining a proactive safety, health, and loss prevention program designed to protect life and property; providing a work environment where recognized health/safety hazards are controlled; and in compliance with all applicable regulatory and legal requirements. BREC holds employee and Contractor safety as one of its most important corporate values. Accordingly, no job, operating condition, or urgency of service can ever justify endangering the health and well-being of any employee or Contractor.

These rules do not replace the contractors' existing safety and health program(s), provided that their program(s) meet or exceed these and any additional site specific minimum requirements. Contractors' employees' not following applicable rules will be subject to removal from the job site.

The contractor is required to comply with all applicable federal and state safety laws and regulations. The contractor is responsible for conducting their work and activities safely. BREC expects and requires that contractors continuously update their employees with respect to safety issues relevant to the work and to take immediate corrective action when their employees violate safety rules or procedures.

Section I. General Safety Requirements

1. Contractors will comply with all applicable federal and state regulations and BREC's safety rules and programs relevant to the work performed.
2. Contractors will be responsible for providing their employees, and any subcontracted employers with all information provided by BREC regarding:
   - Occupational health and safety;
   - Exposure to atmospheric health, serious physical or chemical hazards; and
   - Precautionary measures and procedures for performing the work.
3. BREC's policy prohibits the Contractor's employees, agents or representatives from:
   - Consuming or possessing alcohol and/or non-prescription drugs while on BREC's job sites, including the parking lots;
   - Reporting to perform work on BREC's job sites with unauthorized drugs on his/her person or while under the influence of drugs or alcohol.
   - Performing work that involves operating heavy equipment or working at elevations when using prescribed medication that can cause drowsiness or otherwise impair the employee's ability to perform the work in a safe manner.
4. The following conduct is prohibited by BREC at and about the job site:
   - Theft, horseplay, gambling, sabotage or attempted sabotage.
   - Threatening, intimidating or abusing employees, customers, vendors or guests of BREC.
   - Fighting or creating or inciting a disturbance.
5. Firearms and other weapons are not allowed on BREC's job sites and/or facilities.
6. BREC has a smoke-free policy within all its buildings.
7. Attendance at job site safety meetings is required of the Contractor at the discretion of BREC's designated representative. At least one representative of the Contractor will attend job safety meetings.

8. The Contractor will report any Contractor employee Incident requiring medical attention to BREC's authorized representative immediately and provide a copy of the first report of injury. All injuries, requiring medical attention, must be reported within One (1) hour, even during off shifts.
9. Any Contractor's employee, who appears sick, extremely tired, or otherwise unable to perform his/her job in a safe manner will be reported to the Contractor's supervision for evaluation and possibly removed from the job site.
10. Contractors are responsible for establishing control measures to protect their employees, and/or employees under their control, from exposure to hazards (chemical, atmospheric health and physical) present at the job site.
11. The Contractor must provide electrical ground fault protection for employees using construction power (temporary branch circuits to include extension cords) through the use of approved ground fault circuit interrupters (GFCI). Additionally, Contractors must provide ground fault protection when using permanent facility power and using cord and plug equipment in wet or damp locations. Applies to 120-volt single phase 15 and 20-ampere receptacle outlets.
12. Contractor employees will work in full pants and shirts. Shorts and tank tops are not permitted unless otherwise specified. Some jobs will require wearing 100% cotton long sleeve shirts and pants, fire resistant (FR) clothing or ATPV (Arc Thermal Performance Value) rated clothing.
13. Contractors shall not transport employees in the beds of trucks.
14. All Contractors must receive authorization from BREC's authorized representative before performing work in areas posted as **"Dangerous or Hazardous."**
15. Contractors will provide a competent person to the job site as required by state and federal OSHA standards.
16. Contractors shall provide at a minimum, one bilingual employee for every maximum, group of eight non-English speaking employees. Any deviation requires approval from the BREC President & CEO, plant General Manager, or Vice President.
17. All contractors conducting work that require the use of a respirator or where there may be potential for atmosphere contamination must be clean-shaven and provide a documented respirator fit test.

Section II. Hazard Specific Requirements

The Contractor will ensure that the Contractor's employees are properly equipped and trained to comply with Federal and State regulations, and BREC standards; including but not limited to the following:

- **Personal Protective Equipment (PPE)**
- **Fall Management (personal fall arrest systems, scaffolding, walking work surfaces, ladders and floor and wall openings**
- **Chemical Safety/Hazard Communication**
- **Hazardous Waste and Chemical Spills**
- **Hot Work (Cutting and Welding)**
- **Asbestos**
- **High Voltage**
- **Control of Energy Sources (Lockout/Tagout)**
- **Trenching**
- **Confined Space Entry**

Section III. Enforcement of Safety Rules

The Contractor is responsible for the health and safety of employees under their control. Enforcement of these rules, as well as other recognized safety rules, is the responsibility of the Contractor. The evaluation does not constitute acceptance of the Contractor's safety programs or work practices nor, in any way relieve a Contractor of full responsibility for meeting all appropriate OSHA and other regulations to ensure the safety of employees under their control. Whenever there is a jurisdictional question of which standard will apply (e.g. Big Rivers or the Contractor's), the most stringent safety requirement will take precedence. The Contractor must document exceptions and attach them to this form. Contractors and their employees who do not follow these rules are subject to removal from this project, as well as being banned from future projects/contracts.

Document 3.0
Contractor Safety and Health Questionnaire and Checklist

Big Rivers Electric Corporation is committed to providing a safe and healthy workplace for its employees and the employees of Contractors. To qualify to perform work at BREC, companies must complete the Contractor Safety Credentials Assessment Program. To begin that process companies shall provide BREC the following information and agree to obtain the requested information from all subcontractors utilized, and to provide it upon request.

Please provide a brief description of the work activities to be conducted for Big Rivers: _____

_____

_____

_____

_____

In the table below, provide the three most recent full years of history for the area or region for which this questionnaire applies. In addition, attach copies of applicable OSHA 300A Forms & verification of your workers comp. Experience Modification Rate (EMR)/discount information. Applications without copies of 300A forms and/or EMR may be delayed until received.

ITEM	DESCRIPTION	2012	2011	2010
A	Interstate Experience Modification Rate (EMR)			
B	Recordable Injury Incident Rate (RIR) = (# of Injuries x 200,000 ÷ Total Hours Worked)			
C	Lost Workday Injury and Illness Incident Rate (LWDIR) = (# of Lost-time Injuries and Illnesses x 200,000 ÷ Total Hours Worked)			
D	NAICS (North American industry Classification System) Code			
E	**Using the OSHA 300 Logs from the facilities providing labor, please provide the following:** Severity Rate (Total days lost due to injury or industrial illness) = (Total # days away from work x 200,000 ÷ Total Hours Worked)			
F	Number of Injuries and Illnesses (Columns 1-6 of OSHA 300 Log)			
G	Number of Lost Workday Cases (Column H of OSHA 300 Log)			
H	Number of Injury Related Fatalities (Column G of OSHA 300 Log)			
I	Employee hours worked in each of the last 3 years (If unknown use # of employees x 2080)			
J	Total number of full time employees in each of the last 3 years			
K	Total number of temporary employees in each of the last 3 years			

Document 3.0

If more space is needed, please use reverse side(s) or separate sheet(s)

	Question	Y / N	Comments
1.	Does your company have a written safety and health program?		
2.	Does your company have a written Hazard Communication Program? Is it available for review?		
3.	Does your company have a written environmental compliance assurance program? Is it available for review?		
4.	Who in your company is responsible for coordinating your safety and health program? Name/Job Title: _____ Phone # ( ) _____ Is safety and health a full time responsibility for this position?		
5.	Who conducts OSHA training for your employees? Name/Job Title: _____ Is this person an employee of your company or a consultant?		
6.	Has your company received a citation(s) from a regulatory agency during the last three years? If yes, describe citation(s). (Use additional sheet(s) if necessary)		
7.	Does your company perform safety audits/reviews? If yes, are safety audits documented?		
8.	Who reviews the safety audit/review and how often? Job Title: _____		
9.	Does your company provide/require the following? Hard Hats (ANSI-Z89.1)(29 CFR 1910.135 Foot Protection (ASTM-F2413)(29 CFR 1910.136) Eye Protection (ANSI-Z41.1)(29 CFR 1910.133) Hand Protection (ANSI-Z41.1)(29 CFR 1910.138) Hearing Protection (ANSI-Z41.1)(29 CFR 1910.95) Fall Protection (ANSI-Z41.1)(29 CFR 1926.501 or 1910.66) Respiratory Protection (ANSI-Z41.1)(29 CFR 1910.134) **BREC does not provide PPE (Personal Protective Equipment) to Contractor personnel**		
10.	In addition to regulatory required Personal Protective Equipment, what other PPE is required or supplied? If any, please describe or list: _____		

11.	Does your company use temporary employees? If yes, what percentage of the total hours worked last year was performed by temporary employees? _____% If you are awarded a contract for work at BREC, what percentage of the estimated hours will be performed by temporary employees? _____% How do you ensure that temporary employees have the required OSHA training?		
12.	Does your company have scheduled documented employee safety meetings? If yes, how often? _____		
13.	Who conducts the safety meetings? Job Title: _____		
14.	What manager(s)/supervisor(s) participate in the safety meetings? Job Titles: _____		
15.	Are meetings reviewed and critiqued by manager(s)/supervisor(s)?		
16.	Does your company hold on-site (tailgate/toolbox) safety meetings? If yes, how often? _____ Who conducts these (tailgate/toolbox) safety meetings? Job Titles: _____ Is documentation available for review?		
17.	Does your company have policy requiring written accident/incident reports? Are follow-up investigations conducted? If yes, are corrective actions taken to prevent future incidents?		
18.	Does your company document, investigate and discuss near miss incidents? If yes, is documentation available for review?		
19.	Are accident/incident reports reviewed by manager(s)/supervisor(s)?		
20.	Does your company have a written policy regarding drug screening or testing of your employees? If yes, is a copy available for review?		

21.	Indicate the circumstances in which your company employees may be subject to drug screening. Employment Random Probable Cause Post-Incident Periodic Other		
22.	Does your company have a policy dealing with emergency actions to be taken should a chemical spill occur?		
23.	Are all documents, pertaining to this questionnaire available for auditing? If no, please explain.		
24.	Does your company use subcontractors? If you do use sub-contractors, do you qualify subcontractors based on their ability to address safety, health and environmental requirements? Do you verify that subcontractors meet regulatory requirements?		
25.	Do you employ "non-English" speaking persons or persons with limited English skills? If so, how do you insure that OSHA and your in-house safety programs are adequately communicated?		
26.	If you use or may use sub-contractors to assist with work conducted at Big Rivers Electric Corporation, please explain how you will verify that the employees of that sub-contractor have OSHA training that is commensurate for the tasks which they will be undertaking.		
27.	If you use or may use employees from a temporary labor pool or employees from a union hall, please explain how you will verify that the individuals have OSHA training that is commensurate for the tasks which they will be undertaking.		
28.	If you use or may use the services of employees from a different division of your corporation, please explain how you will verify that the individuals have OSHA training that is commensurate for the tasks which they will be undertaking.		
29.	Does your company provide and require the use of Class 2 & 3 traffic control garments to comply with work zone traffic control requirements?		
30.	Does your company require its employees to use arc protective clothing while conducting work in the vicinity of energized parts? If yes; what is the ATPV (Arc Thermal Performance Value) rating of the following items within your protective clothing system? Shirt Pants Jacket/Coat Cover-all/Bibs Rain gear Traffic Control Garment Other: (please list) _____ Have your employees received training on the hazards of electrical arcs? Have your employees received training on the proper use of your company arc protective clothing system?		

Document 3.0
Big Rivers Electric Corporation
Contractor Health and Safety Training Acknowledgement Form

Please respond to all applicable items with "YES or NO"

PROGRAMS/TRAINING	REFERENCE SOURCE	WRITTEN PROGRAM Y/N	EMPLOYEES ARE TRAINED Y/N
Asbestos (awareness)	OSHA 29 CFR 1926.1101		
Asbestos Class I, II, and III (abatement)	OSHA 29 CFR 1926.1101		
Asbestos Class I, II and III (removal supervisor)	OSHA 29 CFR 1926.1101		
Bloodborne Pathogens	OSHA 29 CFR 1910.1030		
Chainsaw Safety	OSHA 29 CFR 1910.266		
Communications Facilities	OSHA 29 CFR 1910.269		
Confined Space Entry	OSHA 29 CFR 1910.146		
Crawler, Locomotive and Truck Cranes	OSHA 29 CFR 1910.180		
Daily Equipment Inspection/Walk-Around	OSHA 29 CFR 1910.1000; 29 CFR 1926.1101		
Electrical Safety	OSHA 29 CFR 1910.269		
Electrical Safety	OSHA 29 CFR 1910.332		
Emergency Action Plan	OSHA 29 CFR 1910.38		
Excavations	OSHA 29 CFR 1926.651		
Explosives	OSHA 29 CFR 1910.109		
Fall Protection	OSHA 29 CFR 1926.500		
Fire Extinguisher	OSHA 29 CFR 1910.157		
First Aid/CPR	OSHA 29 CFR 1910.151		
Forklifts	OSHA 29 CFR 1910.178		
Hand and Portable Power Tools and Equipment – General	OSHA 29 CFR 1910.241, 242, 243		
Hazard Communication	OSHA 29 CFR 1910.1200		
Hazwoper - Awareness Level	OSHA 29 CFR 1910.120		
Hazwoper 8 Hour	OSHA 29 CFR 1910.120		
Hazwoper 24 Hour	OSHA 29 CFR 1910.120		
Hazwoper 40 Hour	OSHA 29 CFR 1910.120		
Hazwoper Supervisor 8 Hour	OSHA 29 CFR 1910.120		
Hearing Conservation	OSHA 29 CFR 1910.95		
Incipient Fire Fighting	OSHA 29 CFR 1910.157		
Jacks	OSHA 29 CFR 1926.305		
Ladder Safety	OSHA 29 CFR 1926.1060		
Lead Worker	OSHA 29 CFR 1926.62		
Lead Supervisor	OSHA 29 CFR 1926.62		
Line-Clearance Tree Trimming Operations	OSHA 29 CFR 1910.269		
Lockout/Tagout Affected/Authorized Person	OSHA 29 CFR 1910.147		
Lockout/Tagout Affected/Authorized Person	OSHA 29 CFR 1910.269		
Mobile Cranes	OSHA 29 CFR 1926.550		
New Employee Orientation	OSHA 29 CFR 1910.119		

PROGRAMS/TRAINING	REFERENCE SOURCE	WRITTEN PROGRAM Y/N/NA	EMPLOYEES ARE TRAINED Y/N/NA
Overhead and Gantry Cranes	OSHA 29 CFR 1910.179		
Overhead Lines	OSHA 29 CFR 1910.269		
Oxygen-Fuel Gas Welding and Cutting	OSHA 29 CFR 1910.253		
Personal Protective Equipment	OSHA 29 CFR 1910.132		
Process Safety Management	OSHA 29 CFR 1910.119		
Radiation Awareness	902 KAR 100:019		
Respiratory Protection	OSHA 29 CFR 1910.134		
Rigging, Equipment & Material Handling	OSHA 29 CFR 1926.251		
Scaffolding (erector)	OSHA 29 CFR 1926.451		
Scaffolding (user)	OSHA 29 CFR 1926.451		
Servicing Rim Wheels	OSHA 29 CFR 1910.177		
Substations	OSHA 29 CFR 1910.269		
Trenching and Shoring	OSHA 29 CFR 1926.650; 651; 652; and Subpart P		
Underground Electrical Installations	OSHA 29 CFR 1910.269		
Work Zone Traffic Control	Manual on Uniform Traffic Control Devices		
Working on or Near Exposed Energized Parts	OSHA 29 CFR 1910.269		

Please provide any additional information that you feel would be valuable in this process:

(To be completed by Big Rivers Electric Corporation)

Vendor Name: _____ **Approved: Yes** ____ **No** ____

Sign & Date: _____ _____

Coleman Representative **Sebree Representative**

_____ _____

Wilson Representative **Corporate Representative**

Exhibit G

Big Rivers

New Vendor/Vendor Information Change Form

1 d r l r

d r N P r

A C r r H d r r

Street:

Town or City:

Zip/Postal Code:

State/Prov.:

Co ntry:

Telephone:

Facsimile:

Email address:

Website:

B Ord r Addr r d r rd r

Street:

Town or City:

Zip/Postal Code:

State/Prov.:

Telephone:

Email address:

Facsimile:

Sales Contact:

PO Delivery Method: Post, Email, or Fa

C R T Addr r d

Street:

Town or City:

Zip/Postal Code:

State/Prov.:

Co ntry:

Acco nts Receivable Contact :

Telephone:

DUNS N mbering

(Data Universal N mbering System)

Apply for a D-U-N-S Number, the industry standard for business listings

D Cr d C rd Y _____ N _____

D

C r r H d r r Most active office for yo r company that does b siness with Big Rivers Electric Corporation (BREC).
Ord r Addr Location(s) to which yo wish BREC to SEND p rchase orders. Use attachments as necessary.
R Addr Location to which yo wish BREC to SEND invoice payments. Please attach copy of invoice for reference.

D P T r d r N 30)

E S r T S

Professional Services	☐
Charity/Contrib tion	☐
Contractor (Services Only)	☐
Retailer (Materials only)	☐
Contractor/Retailer (Services & Materials)	☐
Other	☐

Specify Prod cts and Services

_____

Does yo r b siness hold a Retail/Resale Certificate
☐ Yes ☐ No

If yes, please provide yo r certificate n mber.

_____

Is yo r b siness one of the following (If yes, please incl de copy of certification) Check all the applicable categories:

MBE ☐ Yes ☐ No

WBE ☐ Yes ☐ No

Small Disadvantaged B siness (SDB) ☐ Yes ☐ No

Veteran ☐ Yes ☐ No

Service Disabled Veteran ☐ Yes ☐ No

Is yo r Company nion affiliated
☐ Yes ☐ No

If Yes, which nion affiliated organi ation

_____

U d r 15 U S C 645 d r r r r 1 d r r
2 d r r d d 3 r r r r d d d r
r S B A

S r r r d r T D

I d

☐ Standard Ind stry Code (SIC Code): _____

☐ North American Ind stry Code Standard (NAICS Code): _____

☐ E ropean Classification Code (eClass Code): _____

F C l r
W r d r

Name:

Telephone:

E-mail:

W AFTER HOURS r EMERGENCY SER ICE r r

Name:

Telephone:

E-mail:

T d BREC r

D C r : T C C r GSA PSA Qualified

I d r R r O T Y ____ N ____ *If yes, this vendor will have a future inactive date inserted at time of creation based on the Payment Terms.

G I r F r d d r TAX AT R r _____

H I r U d S d F r W-9 d d W r r r d
d r r r F r r d r dr
d 31 d 50 d IRS I F r W-9 r
CHECK APPROPRIATE BOX FOR CORPORATION SOLE PROPRIETORSHIP PARTNERSHIP OR OTHER I d d
r r r r d d r d S S r N r M r YOUR TAX ID NUMBER IS 9 DIGITS
T B N d r r rd r d

Exhibit H

Form **W-9**
(Rev. December 2011)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name/disregarded entity name, if different from above

Check appropriate box for federal tax classification:
☐ Individual/sole proprietor ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶

☐ Other (see instructions) ▶

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

			–		–				

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here | **Signature of U.S. person ▶** | **Date ▶**

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,
- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS a percentage of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account, for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name/disregarded entity name" line.

Partnership, C Corporation, or S Corporation. Enter the entity's name on the "Name" line and any business, trade, or "doing business as (DBA) name" on the "Business name/disregarded entity name" line.

Disregarded entity. Enter the owner's name on the "Name" line. The name of the entity entered on the "Name" line should never be a disregarded entity. The name on the "Name" line must be the name shown on the income tax return on which the income will be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a domestic owner, the domestic owner's name is required to be provided on the "Name" line. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on the "Business name/disregarded entity name" line. If the owner of the disregarded entity is a foreign person, you must complete an appropriate Form W-8.

Note. Check the appropriate box for the federal tax classification of the person whose name is entered on the "Name" line (Individual/sole proprietor, Partnership, C Corporation, S Corporation, Trust/estate).

Limited Liability Company (LLC). If the person identified on the "Name" line is an LLC, check the "Limited liability company" box only and enter the appropriate code for the tax classification in the space provided. If you are an LLC that is treated as a partnership for federal tax purposes, enter "P" for partnership. If you are an LLC that has filed a Form 8832 or a Form 2553 to be taxed as a corporation, enter "C" for C corporation or "S" for S corporation. If you are an LLC that is disregarded as an entity separate from its owner under Regulation section 301.7701-3 (except for employment and excise tax), do not check the LLC box unless the owner of the LLC (required to be identified on the "Name" line) is another LLC that is not disregarded for federal tax purposes. If the LLC is disregarded as an entity separate from its owner, enter the appropriate tax classification of the owner identified on the "Name" line.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name/ disregarded entity name" line.

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the "Exempt payee" box in the line following the "Business name/ disregarded entity name," sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 5 and 7 through 13. Also, C corporations.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over $600 required to be reported and direct sales over $5,000 [1]	Generally, exempt payees 1 through 7 [2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, below, and items 4 and 5 on page 4 indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on the "Name" line must sign. Exempt payees, see *Exempt Payee* on page 3.

Signature requirements. Complete the certification as indicated in items 1 through 3, below, and items 4 and 5 on page 4.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

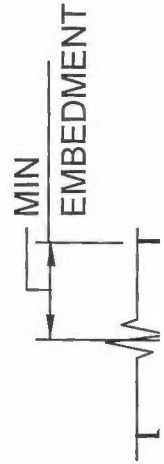
3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

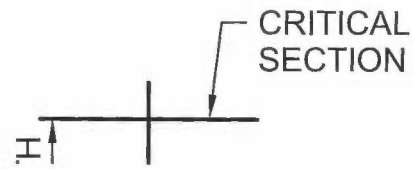
Exhibit I

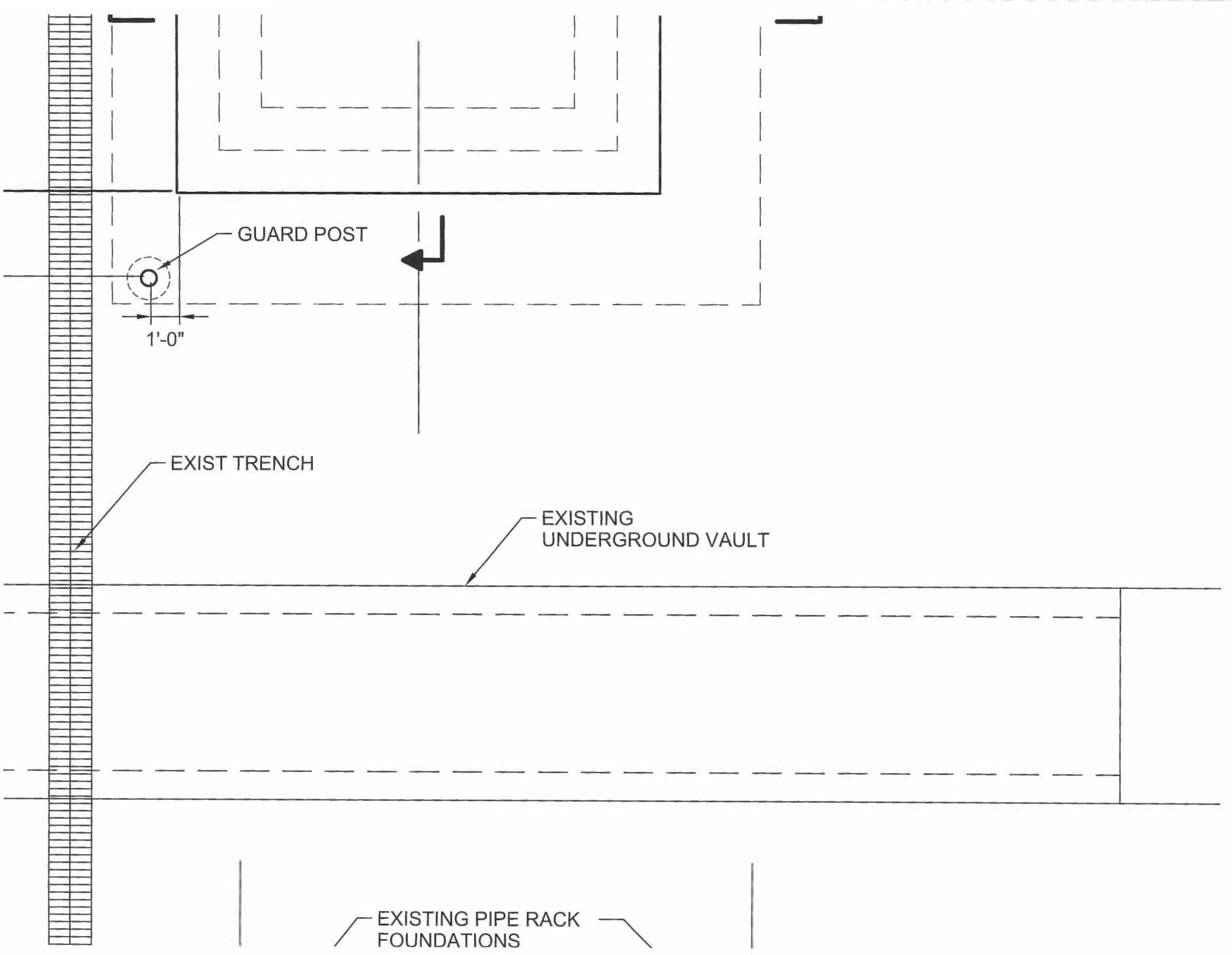
EEL SHALL BE MARKED WITH METAL OR
OR IDENTIFICATION MATCHING SHOP

RCING STEEL SHOP DRAWINGS FOR
R TO FABRICATION.
ESSORIES SHALL CONFORM TO ACI SP-66
ANUAL OF STANDARD PRACTICE.

DE□ELOPMENT LENGTHS HOOKED BARS □□□ □ 4000□□□	
BAR SIZE	LENGTH OR MIN EMBEDMENT
#3	7"
#4	10"
#5	1'-0"
#6	1'-3"
#7	1'-5"
#8	1'-7"
#9	1'-10"
#10	2'-0"
#11	2'-3"






GUARD POST
1'-0"
EXIST TRENCH
EXISTING
UNDERGROUND VAULT
EXISTING PIPE RACK
FOUNDATIONS

CONCR

AVP INC.

General Contractor

P. O. Box 973 • Henderson, KY 42419
4869 Old Madisonville Road • Henderson, KY 42420
Ph. 270-826-7711 • Fax 270-827-3723

September 16, 2013

Big Rivers Electric Corporation
201 Third St.
P.O. Box 24
Henderson, Kentucky 42419-0024
Attn: Mr. Rob Toerne

Dear Mr. Toerne:

As per the Request For Quotation #BR13160 we are furnishing herein our time and material rates for any extra work required for this project. We will bill net cost plus 15% for overhead and profit for any extra work. Thank you.

Sincerely yours,

Alan V. Powell, President

AVP/ap
Brec1

Big Rivers Electric Corporation
Submittal Form
RFQ #HDQ-13-160

PROPOSAL

The Bidder agrees to perform the all work described in this specification and other attached documents for the following firm lump sum price:

Green Station PCM Building Foundation

Labor	$	9,025.00
Equipment	$	1,700.00
Materials	$	10,000.00
Total Price	$	20,725.00

[X] **TIME AND MATERIALS RATE SHEET ATTACHED**

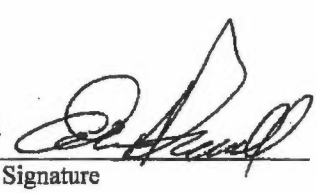
[ ] **ADDENDA ACCEPTANCE** (ATTACHED)

[x] NOT APPLICABLE

[X] **EXCEPTIONS & CLARIFICATIONS** (ATTACHED)

[ ] NOT APPLICABLE

Included	Previously Submitted	
[ ]	[X]	**General Services Agreement**
[ ]	[X]	**Contractor Safety Credentials Assessment Program Forms**
[ ]	[X]	**Equal Opportunity, Debarment, & Lobbying Forms**
[ ]	[X]	**Vendor Information & W-9 Forms**

A.V.P., Inc.	Alan V. Powell		9-16-13
Company Name	Printed Name	Signature	Date

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

BID CLARIFICATIONS AND/OR EXCEPTIONS

Bidder offers the following clarifications and/or exceptions taken to any requirement or provision of this Request For Quotation and any proposed modifications or replacement language for each clarification or exception (If none, so state)

1. We base this bid on being able to fully access the site of work with equipment and deliveries.

2. We base this bid on being able to waste excavated materials on site.

Bidder understands that unless itemized above, no other clarifications or exceptions to this Request for Quotation are taken by the Bidder.

A.V.P., Inc.

Bidder

Signature of Executing Party

9-16-13

Date

Toerne, Rob

From: Alan Powell <avp@lightpower.net>
Sent: Wednesday, October 02, 2013 9:55 AM
To: Rob Toerne
Subject: Re: wilson/Coleman

Rob,

We started Coleman on Monday. We have excavated the hole, installed DGA, and poured the mud slab. Today we are going to form the outside and hopefully the rebar will be delivered today. If the rebar is delivered today we should get this ready to pour today and tomorrow and pour Friday. We then could clean up on Monday at Coleman. The rebar for Wilson is not going to be delivered until Friday - I didnt want to have a hole opened up for a week without any activity so we will be there either Friday or Monday depending on when the rebar supplier can get it fabricated and delivered. We did get the sawing done last Friday at Wilson. Thanks.

Alan Powell

----- Original Message -----
From: Rob Toerne
To: Alan Powell
Sent: Wednesday, October 02, 2013 8:32 AM
Subject: RE: wilson/Coleman

Alan,
I saw the asphalt cut at Wilson but I haven't been to Coleman. I now understand there is not asphalt to be cut but where you able to paint lines or do anything to qualify as starting at Coleman?

Rob Toerne
Director, Supply Chain
Big Rivers Electric Corporation

Email: rob.toerne@bigrivers.com
Office Phone: 270.844.6029
Cell Phone: 270.993.1604
Fax Line: 888.268.6219

From: Alan Powell [mailto:avp@lightpower.net]
Sent: Monday, September 23, 2013 10:36 AM
To: Rob Toerne
Subject: wilson/Coleman

Rob Toerne,

This email is our formal proposal to complete the installation of the concrete pads at your Wilson/Coleman plants as per the drawings you previously sent. The work will be completed similiar to the work that we are completing at Reid/Green plant with the exception of the size of the pads. The pricing for the pads are as follows:

Coleman - $14,155.00
Wilson - $18,798.00

Thank you and please feel free to call with any questions.

Alan Powell

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
220972	1	1

SHIP TO:
R. D. Green Station
9000 HWY 2096
Robards,KY 42452

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR:
AVP, INC
PO BOX 973
4869 OLD MADISONVILLE RD
HENDERSON, KY 42419

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 80607	DELIVER TO	DATE OF ORDER/BUYER 16-SEP-13 Frederick, Dana Leigh	REVISED DATE/BUYER 25-SEP-13 Frederick, Dana Leigh
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6139 888-514-3178	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA	VENDOR CONTACT/TELEPHONE (270) 826-7711

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO:
DANA FREDERICK - HEADQUARTERS PHONE (270) 844-6139
FAX (888) 514-3178
EMAIL: DANA.FREDERICK@BIGRIVERS.COM

INVOICING REGARDING THIS ORDER REQUIRES INDIVIDUAL TOTALS FOR LABOR AND MATERIALS. (KENTUCKY SALES & USE TAX REQUIREMENT)

BIG RIVERS ELECTRIC CORP HAS DIRECT PAY AUTHORIZATION FOR KENTUCKY SALES & USE TAX. OUR PERMIT # IS 108814. PLEASE CONTACT THE BREC ACCOUNTS PAYABLE DEPARTMENT AT 270-827-2561 IF YOU DO NOT HAVE A CERTIFICATE ON FILE.

ALLAN POWEL, AS PER QUOTE DATED 9/16/13 AND RFQ# BR-13-160

A signed copy of the General Services Agreement (GSA) is on file at Big Rivers Electric Corporation and is hereby incorporated by reference.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	LABOR FOR FOUNDATION AT SEBREE	15-OCT-13	9025	EACH	$ 1.00	$ 9,025.00
2.1	EQUIPMENT FOR SEBREE	15-OCT-13	1700	EACH	$ 1.00	$ 1,700.00
3.1	MATERIALS FOR SEBREE	15-OCT-13	10000	EACH	$ 1.00	$ 10,000.00
4.1	LABOR FOR FOUNDATION FOR COLEMAN		4800	EACH	$ 1.00	$ 4,800.00
5.1	EQUIPMENT FOR COLEMAN		3000	EACH	$ 1.00	$ 3,000.00
6.1	MATERIALS FOR COLEMAN		6355	EACH	$ 1.00	$ 6,355.00
7.1	LABOR FOR FOUNDATION AT WILSON		6798	EACH	$ 1.00	$ 6,798.00
8.1	EQUIPMENT FOR WILSON		3000	EACH	$ 1.00	$ 3,000.00

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
220972	1	2

SHIP TO:
R. D. Green Station
9000 HWY 2096
Robards,KY 42452

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR:
AVP, INC
PO BOX 973
4869 OLD MADISONVILLE RD
HENDERSON, KY 42419

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
9.1	MATERIALS FOR WILSON		9000	EACH	$ 1.00	$ 9,000.00

TOTAL $ 53,678.00

Lisa R Frederick

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

Foundation Pilings to Support the Mercury and Air Toxics Standard (MATS) Compliance Project

RFQ #GN-14-018

Table of Contents

1. Overview

1.1. Big Rivers Electric Corporation (Big Rivers) will be accepting bids to provide qualified labor, experienced supervision, tools, equipment, materials, consumables, and services as required to install foundation pilings in support of Burns & McDonnell's design efforts for the proposed Mercury and Air Toxics Standard (MATS) Compliance Project at the Big Rivers' Green Station near Robards, Kentucky. The piling work is described in more detail throughout this specification, specifically Section 9 – Engineer's Technical Specification.

1.2. If any conditions, circumstances or occurrences not covered in the Specification are encountered, or if there are any doubts as to the meaning, contact the designated representative.

1.3. The Contractor shall not assign, or sublet any part of the Work or this Specification without first obtaining Big Rivers' written approval. Such approval, if given, will not relieve the Contractor from full responsibility for the fulfillment of all obligations under this Specification.

1.4. Big Rivers Electric Corporation reserves the right to reject any or all Bids, to waive informalities therein and to consider exceptions and clarifications therein in order to determine the lowest and best bid; to reject any or all non-conforming, non-responsive, unbalanced or conditional Bids; to reject the Bid of any Contractor that it would not be in the best interest of the Project to make an award to that Contractor, whether because the Bid is not responsive or the Contractor is unqualified or of doubtful financial ability, or fails to meet any other pertinent standard or criteria established. The Company also reserves the right to negotiate contract terms with the successful Contractor. By submitting a Bid, the Contractor agrees that such procedures will be without liability for any damage or claim brought by the Contractor because of such rejections or procedures, nor will the Contractor seek any recourse of any kind against the Company because of such rejections or procedures. The filing of any Bid in response to this Invitation will constitute an agreement of the Contractor to these conditions.

2. Proposal Preparation and Submittal

2.1. All bids will be valid for ninety (90) days from the opening of the bid.

2.2. All bidders must complete and submit all documents listed within the Appendices.

2.3. The Bidder may submit a list of any sub-contractors that might be used for this project for pre-approval. The submittal must include experience lists and reference contacts for all proposed sub-contractors.

2.4. Any addenda to this request for quotation (RFQ) shall be signed by the Bidder and will be returned with the proposal.

2.5. Any deviations from or exceptions to this specification, terms and conditions, or the submittals may impact the evaluation of the Bidder's proposal. Please list all clarifications and exceptions on EXHIBIT 1 – CLARIFICATIONS AND

EXCEPTIONS form found within Section 9 - Engineer's Technical Specification. This document is also attached as a Microsoft Excel document for the convenience of the bidder.

2.6. The Bidder will submit sufficient information and detail with the bid to permit full understanding and evaluation of the equipment and services being offered.

2.7. The Bidder will the BID FORM listed within Section 9 - Engineer's Technical Specification. The BID FORM is also attached as a Microsoft Excel document for the convenience of the bidder.

2.8. The proposal shall be submitted by hard copy in a sealed envelope and delivered by the USPC, courier, or hand delivery. It must be prominently with the RFQ number; GN-14-018. Proposals must be delivered no later than March 26, 2014 by 2:00 p.m. (Central Time). Proposals received after this date and time will be returned and will not be considered. Proposals shall consist of three hard copies and one electronic copy (DVD, CD or thumb drive). The proposal and shall be submitted to the Big Rivers Supply Chain department at the following addresses:

2.8.1. Big Rivers Electric Corporation
Attn: Rob Toerne
201 Third Street
PO Box 24
Henderson, KY 42419-0024

2.9. Questions may be directed to Rob Toerne using the following contact information:

2.9.1. Email: rob.toerne@bigrivers.com
2.9.2. Office: 270-844-6029
2.9.3. Fax: 888-268-6219

2.10. This inquiry implies no obligation on the part of Big Rivers. The Bidder offers the prices, terms, and delivery freely and without bias.

2.11. All expenses incurred by the Bidder in the development of this bid are the sole responsibility of the Bidder.

2.12. The evaluation methodology that will be used to identify the winning bid includes, but is not limited to the following four elements: the Non-Responsiveness Test, the Price Evaluation, Qualification/Certification Evaluation, and the Technical Evaluation. The purpose of each element and the process employed in each are described in the following sections.

2.12.1. Non-Responsiveness Evaluation: The Non-Responsiveness Evaluation is designed to identify and eliminate any proposal that has not provided the requested information in a proper format to allow an equitable evaluation to occur or that does not meet the requirements set forth in this RFQ. A bid deemed non-responsive by Big Rivers may be rejected. Bidders are subject to disqualification for such things as failure to submit the proposal on or before the designated time and date. Big Rivers Electric Corporation may, in its

discretion, disqualify a bid and drop it from further consideration for failure to submit a complete proposal in the form required or failure to provide additional supporting documentation or any clarification that may be requested by Big Rivers subsequent to the submission of the proposal.

2.12.2. Price Evaluation: The Price Evaluation is designed to identify and eliminate bids which are clearly more expensive than other compliant proposals received. This will be accomplished by ranking the bids, as well as the designated options, against each other according to price. Preliminary estimates of production cost effects, operation and maintenance costs, and other pertinent costs will be made and added to each proposal for evaluation purposes. The evaluation will also include an estimate of the negative impact of deviations or exceptions, if any, to the terms and conditions in the proposed Contract or in other agreements contemplated to be entered into. Big Rivers expects the bid to contain an early payment discount structure which terms will also be part of the evaluation.

2.12.3. Qualification/Certification Evaluation: The Qualification/Certification Evaluation is designed to identify and eliminate bids that clearly demonstrate a lack of understanding or an inability to meet the intended Specification for this project. Big Rivers Electric Corporation requires all on-site contractors to complete the Contractor Certification process before any on-site work is awarded. Therefore, a winning Bidder will, among other things, submit or confirm on file the completed and fully executed General Services Agreement, and safety rules, and will agree that all site workers will be in compliance with the CSCAP Program and any site specific safety requirements which will apply to all work.

2.12.4. Technical Evaluation: The Technical Evaluation will consist of a comprehensive review that considers a number of price and non-price factors. The goal of the Technical Evaluation is to determine the options that best meet the needs of Big Rivers for this project and technical options which improve the facility's overall cost, reliability and availability.

3. General Requirements

3.1. Upon award, all work will be governed by the terms and conditions set forth in the Specification and Bid Instructions, including, without limitation, the General Services Agreement (Appendix C).

3.2. The Contractor will, upon bid award, submit a Certificate of Insurance naming Big Rivers Electric Corporation as the holder of the certificate. The certificate will also show Big Rivers Electric Corporation as additional insured. Insurance coverage must meet as a minimum, the insurance requirements as specified in General Services Agreement.

3.3. Big Rivers is committed to procuring safe work for all Purchase Orders. The Contractor and every on-site employee must be certified through and current with Big Rivers' Contractor Safety Credentials Assessment Program (C-SCAP Program; Appendix G). Contractor will comply with all applicable OSHA, KOSHA, EPA, Big Rivers' rules or other safety practices, rules and regulations that govern work while

on the Big Rivers' sites. Big Rivers may stop work and/or remove the Contractor from the worksite which may lead to termination of this agreement by Big Rivers without further obligation to the Contractor, if the Contractor fails to observe safety requirements.

3.4. Upon award, the Contractor shall complete and submit all other forms listed in the appendices. However, any form referenced in the appendices which is submitted with the Proposal will result in an expedited award.

3.5. The Contractor will abide by the items in this Specification unless Big Rivers agrees in writing to any changes. Changes must be made in the form of a written request.

3.6. The criteria listed in this Specification should be used as a base line. Actual work required to perform this Specification may not be listed. It is expected that work required to access or reassemble specified work will be included as part of this Specification. The Specification entries may not be in chronological order or inclusive of all the job elements. It is the responsibility of the Contractor to realize and correct this.

4. Schedule Requirements

4.1. The time of completion of the Work is a basic consideration of the Specification. The proposal will be based upon completion of the Work during an allotted time window defined within Section 9 - Engineer's Technical Specification; Entry 1.09 of Section 0111001.

4.2. The Contractor will adhere to the schedule. The schedule provided within this Specification may be updated prior to the project. The Contractor will take any and all actions necessary to ensure scheduled completion.

4.3. The Contractor shall submit a final schedule showing the duration, milestones and major task just prior to start of work.

4.4. The Contractor will provide a weekly project status update to the designated Big Rivers representative.

4.5. The Contractor shall maintain, throughout the duration of the job, a schedule with the work progression of individual job elements. The schedule will be up-dated regularly and will be available to Big Rivers for review at any time. The schedule will be broken down to show individual job elements.

4.6. If at any time during the progress of the work it is determined that the scheduled completion date cannot be met, Big Rivers reserves the right to take any action it deems necessary to ensure timely completion.

5. Job Site Requirements

5.1. The Contractor will provide all necessary supervision, labor, job management, materials, tools, equipment and consumables deemed necessary to ensure safe, proper and timely completion of the specified work.

5.2. The Contractor's on-site employees will be in compliance with all C-SCAP requirements.

5.3. The Contractor will utilize all of the information presented in this document to be fully prepared to begin work at the specified commencement date and time. The Contractor will ensure that a copy of this document has been reviewed by and is in the possession of the on-site superintendent.

5.4. The Contractor will ensure that all instructions and emergency warnings can be effectively and immediately communicated to all employees. Unless otherwise instructed Big Rivers requires that one (1) interpreter be provided for every eight (8) non-English speaking employees.

5.5. The Contractor will provide all necessary personnel protective equipment for each of its employees along with documentation of proper training in the use of said equipment.

5.6. The Contractor will protect its own employees and its Sub-contractors' employees and be responsible for their work until the Big Rivers' acceptance of the entire project, and to protect Big Rivers' facilities, property, employees and third parties from damage or injury.

5.7. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the Contractor.

5.8. The Contractor will inform Big Rivers of any hazardous chemicals that will be transported or used on the plant site. Material Safety Data Sheets (MSDS) must be provided to the Safety Training Coordinator prior to use on the plant site and must be available at all times while on the plant site.

5.9. The Contractor will comply with the latest or amended version of the followings standards and codes, and with any and all other standards and codes that may be applicable:

5.9.1. National Fire Protection Association (NFPA)
5.9.2. National Electrical Code (NEC)
5.9.3. National Electrical Manufacturers Association (NEMA)
5.9.4. Electrical Apparatus Service Association (EASA)
5.9.5. International Electrical Testing Association (NETA)
5.9.6. Factory Mutual (FM)

5.10. The Contractor will notify the designated Big Rivers representative upon completion of each phase of the work.

5.11. The Contractor will ensure that all discarded material and trash removed from the site or placed in an approved dumpster.

5.11.1. Big Rivers may provide on-site dumpsters for the disposal of non-hazardous waste material. Debris must not be stacked beyond the top of the dumpster.

5.12. The Contractor will not discharge petroleum products anywhere on the plant site. Fuel, lubrication products and any other liquid consumables stored on-site will be in an appropriate tank or container with proper labeling. Use of the proper container and the Big Rivers' approval of such containers in no way releases the Contractor from its responsibility to clean up any spills, discharges, or other releases.

5.13. During the project, unanticipated repairs or work may be encountered. If such needs are discovered during the project, they will be communicated to the designated Big Rivers representative by the Contractor's on-site supervisor as soon as possible.

5.13.1. The Contractor will obtain sufficient information to present a firm dollar quote for any emerging work for this project.

5.13.2. No additional work will be performed until the Contractor has been given written authorization to proceed by the Big Rivers.

5.14. The Contractor will exercise care in the protection of materials and equipment furnished under this Contract.

5.15. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the Contractor.

5.16. The Contractor will warrant to Big Rivers that all work will be in accordance with this Specification and will be free from defects in material and workmanship. Prompt notice of all defects will be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted by Big Rivers. If Contractor does not promptly comply, or in an emergency where delay would cause serious risk of loss or damage, Big Rivers may, upon written notice to the Contractor, have the defective work corrected or the rejected work removed and replaced, and all direct costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) will be paid by Contractor.

6. Site Supervision

6.1. The Contractor will designate an on-site contact person with the authority to make decisions, correct problems and generally oversee the Contractor's operations. In the event the contact person is absent from the job site, an alternate contact person with full will be available onsite during all activities relating to this project.

6.1.1. There will be a designated Big Rivers representative on site, during day shift, to coordinate work schedules, safety issues, etc.

6.2. The Contractor will provide in writing the name and phone number (office, home, pager and mobile as applicable) of the contact person and the alternate contact person(s) prior to the start of work hereunder and within one working day of any changes in the previously designated contact person.

6.3. To the extent possible, the on-site contact person will be the same from week to week to ensure job continuity.

6.4. The Contractor will provide after hours, emergency 24-hour per day contact list. The list will be prioritized as to the order that should be followed in notifying the Contractor.

7. Notices

7.1. Any notice, request, or approval or other document required or permitted to be given under this contract will be in writing unless otherwise provided herein and will be deemed to have been sufficiently given if delivered in person, transmitted by fax followed by a hard copy, dispatched in the U.S. mails, postage prepaid for mailing by certified or registered mail, return receipt requested, or dispatched for delivery by other courier service providing a return receipt, addressed as follows:

7.2. If to Big Rivers, addressed to:

Big Rivers Electric Corporation
P0 Box 24
Henderson, KY 42420
Attention: Procurement
Phone: 270-844-6173
Cell: 270-993-1576
Fax: 888-518-3410

7.3. If to Contractor, addressed to:

_____

_____

_____

_____

_____

_____

_____

_____

8. Definitions

8.1. "Addenda" - written or graphic changes or interpretations of the Contract Documents issued by Owner prior to the opening of Bids.

8.2. "Administrator" shall mean the Administrator of the Rural Utilities Service of the United States of America and his or her duly authorized representative or any other person in whom or authority in which may be vested the duties and functions which the Administrator is now authorized by law to perform.

8.3. "Application for Payment" - the form acceptable to Owner and Engineer which is to be used by Bidder during the course of the Work in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

8.4. "Bid" - the formal offer of the Bidder submitted on the prescribed Bid Form and all information submitted with the Bid that pertains to performance of the Work.

8.5. "Bidder" – Prior to Contract award, "Bidder" is any person, firm, or corporation submitting a Bid for the Work or their duly authorized representative. Upon contract award, "Bidder" is the person, firm or corporation with whom the Owner has entered into the Contract.

8.6. "Change Order" - a written document recommended by Engineer which is signed by Owner and Bidder and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Time or other material provision issued on or after execution of the Contract.

8.7. "Contract" - the written agreement between Owner and Bidder covering the Work to be performed. Other Contract Documents are attached to the Contract and made a part thereof as provided therein.

8.8. "Contract Documents" - RUS Form 198 or RUS Form 200, all documents referenced in the table of contents, Exhibits, Attachments, affidavits, bonds, insurance requirements and documents, releases, Specifications, drawings, and Change Orders or signed amendments issued to the Contract.

8.9. "Contract Time" - the number of days or the dates stated in the Contract Documents for the completion of the Work.

8.10. "Date of Contract" - the date on which the Contract is signed and executed by the Owner.

8.11. "Day" or "Days" - a calendar day of 24 hours measured from midnight to the next midnight shall constitute a day.

8.12. "DDP" (Delivered Duties Paid) (Incoterms 2000) Point of Delivery - The Contract Price includes all costs of transporting Equipment and Materials to the named Point of Delivery, including but not limited to any duties, permits, and insurance for the full value of the Equipment and Materials being delivered.

8.13. "Defective" - an adjective which when modifying the words Equipment and Materials, or Field Services refers to Equipment and Materials or Field Services which do not conform to the Contract Documents, or do not meet the requirements of any inspection reference standard, test, or approval referred to in the Contract Documents.

8.14. "Effective Date of the Contract" – the date of acceptance of Contract by Owner which may be in the form of a dated purchase order.

8.15. "Engineer" shall mean the Engineer employed by the Owner, to provide engineering services for the project and said Engineer's duly authorized assistants and representatives. For this Project, "Engineer" means Burns & McDonnell Engineering Company, Inc. a Missouri Corporation, with offices at 9400 Ward Parkway, Kansas City, Missouri 64114.

8.16. "Equipment" - a product with operational or nonoperational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

8.17. "Field Services" - services to be furnished by Contractor at the Site as required by the Contract Documents.

8.18. "Final Acceptance" - the Work has progressed to the point where, in the opinion of Owner and Engineer, it is sufficiently complete, in accordance with the Contract Documents.

8.19. "Laws and Regulations," "Laws or Regulations" - laws, rules, regulations, ordinances, codes and/or orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

8.20. "Materials" - products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.

8.21. "Notice to Proceed" - the written notice by Owner to Bidder fixing the date on which the Contract Times will commence to run and on which Bidder shall start to perform Bidder's obligation under the Contract.

8.22. "Owner" – Big River Electric Corporation, also referred to as "BREC", Big "Rivers", or "Company".

8.23. "Point of Delivery" – the place designated where the Equipment and Materials are to be delivered:

8.23.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

8.24. "Parties" - Owner and Bidder, each of which is individually a "Party".

8.25. "Payment and Cancellation Schedule" - the detailed listing of activities or milestones with an associated payment percentage of the total Contract Price which accurately reflects payment for Work accomplished and cancellation percentage of the total Contract Price which reflects the payment(s) agreed to between the Parties in the

event of cancellation. This schedule shall be jointly developed and agreed to by Owner and Contractor.

8.26. "Project" - the total construction of which the Work to be provided under the Contract may be the whole, or a part as indicated elsewhere in the Contract.

8.27. Reference Drawings" - drawings not specifically prepared for this Contract, but which contain information pertinent to the Work.

8.28. "Samples" - physical examples of Equipment, Materials, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

8.29. "Shop Drawings" - all drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

8.30. "Site", "Job Site" or "Point of Delivery" - the Owner's Station where Equipment is being delivered or services are to be performed:

8.30.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

8.31. "Specifications" - those portions of the Contract Documents consisting of written descriptions of the Work, and covering the Equipment, Materials, workmanship, performance and certain administrative details applicable thereto.

8.32. "Subcontractor" - an individual, firm, or corporation having a direct contract with Contractor to perform a portion of the Work.

8.33. "Submittals" - all Shop Drawings, product data, and Samples which are prepared by Contractor, a Subcontractor, manufacturer or Supplier, and submitted by Contractor to Owner and Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe proper installation, operation, and maintenance, or technical properties.

8.34. "Substantial Completion" - the event when, as determined in Owner's reasonably exercised discretion, (i) erection or installation of the Equipment and Materials furnished under the Contract has been completed by the installing contractor and required Field Services have been furnished, (ii) the Equipment and Materials are operating safely for the purpose of commissioning and startup, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the performance guarantees have been verified by Owner and Engineer and the warranty period has commenced, and (v) Contractor has delivered to Company all operating instructions, maintenance manuals, and warranties.

8.35. "Supplier" - a manufacturer, fabricator, supplier, distributor, material man, or vendor of Bidder.

8.36. "Work" - the goods and all services required by the Contract, and includes all labor, Materials, Equipment and services provided or to be provided by the Contractor to

fulfill the Contractor's obligations herein. The Work may constitute the whole or a part of the Project.

8.37. "Force Majeure" - any condition, event or circumstance, including the examples set forth below, but only if, and to the extent (i) such condition, event or circumstance is not within the reasonable control of the Party affected, (ii) such condition, event or circumstance, despite the exercise of reasonable diligence, cannot be prevented, avoided or removed by such Party, (iii) such condition, event or circumstance materially adversely affects the ability of the affected Party to fulfill its obligations under this Agreement, (iv) the affected Party has taken all commercially reasonable precautions, due care and commercially reasonable alternative measures in order to avoid the effect of such condition, event or circumstance on the affected Party's ability to fulfill its obligations under this Agreement and to mitigate the consequences thereof and (v) such condition, event or circumstance is not the result of any failure of such Party to perform any of its obligations under this Agreement. By way of example, such events, conditions and circumstances shall include war, rebellion, sabotage, riots, insurrection, public disorder, fires, floods, volcanic eruption, tidal wave, earthquake, quarantine, explosions or other natural catastrophes or Acts of God, and changes in Applicable Laws after the Effective Date of the Contract.

This page intentionally left blank.

Big Rivers
ELECTRIC CORPORATION

Big Rivers Electric Corporation

Green Station MATS Compliance Project

Contract 8210
Piling

Contract Documents

Burns & McDonnell Project 73827
April 2014

Burns & McDonnell
SINCE 1898

BIG RIVERS ELECTRIC CORPORATION
Green Station MATS Compliance Project – Units No. 1 and 2
Contract No. 8210 – Piling
Burns & McDonnell Project No. 73827

DOCUMENT 00005 - INDEX AND CERTIFICATION PAGE

TECHNICAL SPECIFICATIONS

DOCUMENT/ DIVISION	DESCRIPTION	NUMBER OF PAGES
Division 1	General Requirements	65
Division 31	Earthwork	12

CERTIFICATION(S)

Stanley C Lawson
15-APR-2014

Big Rivers Electric Corporation
Green Station MATS Compliance Project – Units No. 1 and 2
Contract No. 8210 - Piling
Burns & McDonnell Project No. 73827

TABLE OF CONTENTS

Burns & McDonnell
SINCE 1898
www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827
CONTRACT: 8210 Pilings
BIDDER'S NAME: Industrial Contractors Skanska Revision 1
BID NO: GN-14-018

BIDDER IS TO FILL IN ALL HIGHLIGHTED BLANKS.

1 Schedule:

Submittals: See SECTION 013301

[x] No Exception Taken

[ ] Exception are stated in the attached Clarification and Exceptions Spreadsheet

Construction Milestones: See SECTION 011101

[x] No Exception Taken

[ ] Exception are stated in the attached Clarification and Exceptions Spreadsheet

2 Bidder's manufacturing, fabrication, or warehouse location from which proposed equipment or materials will be shipped:

Evansville
(City, State, Country)

Supply shipping weights and dimensions as an attachment to your proposal.

3 List of Subsuppliers and/or Work that will be subcontracted is as follows:

Subsupplier Name	Scope of Work
Skyline Steel	**supply h-pile**
GRL Engineering	**dynamic pile testing**

4 Quotation Includes Taxes?: Yes x No

5 Addenda. Bidder represents that Bidder has examined the following Addenda, receipt of which is hereby acknowledged. Failure to acknowledge receipt of any duly issued Addendum may be cause for rejection of Quotation.

No.	Date
1	3/13/2014
2	3/13/2014

6

BID COMPLIANCE. If Bidder takes exception to any of the information included in the Bid Documents, such exception shall be clearly stated on the Clarifications and Exceptions spreadsheet provided in the bid documents and incorporated into your Proposal.

If no exceptions are taken, it is agreed that the Bidder understands, accepts and will comply with all requirements specified in the Bid Documents.

Burns & McDonnell SINCE 1898
www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827
CONTRACT: 8210 Pilings
BIDDER'S NAME: Industrial Contractors Skanska Revision 1
BID NO: GN-14-018

A. **Technical Specifications**. Includes data sheets, specifications, drawings and ALL other technical attachments included in Bid Documents.

☐ No Exception Taken
☒ Exception are stated in the attached Clarification and Exceptions Spreadsheet

B. **General Term and Conditions**. Any specific exceptions to the terms and conditions must be so stated in your Proposal by listing the applicable Article number and specific verbiage proposed on the Clarifications and Exceptions spreadsheet provided. Please note that blanket exception of any of the terms and conditions or reference to Bidder's standard terms and conditions are not acceptable and will be grounds for rejection of your Proposal.

☒ No Exception Taken
☐ Exception are stated in the attached Clarification and Exceptions Spreadsheet

7 PROPOSAL PRICE SUMMARY. All prices are in US$.

Description	Unit of Measure	Quantity	Unit Price	Extended Price
Revised 4/3/2014				$0.00
Furnish and install all piles - Phase 1	ea	81	2760	$223,560.00
Furnish and install all piles - Phase 2	ea	6	2950	$17,700.00
Test pile program.	ea	10	2000	$20,000.00
Surveying to locate piling and the cost to remove and dispose of spoil or waste.	ea	87	50	$4,350.00
All splices, complete in place.	ea	0	0	$0.00
All pile points, complete in place.	ea	87	100	$8,700.00
Taxes	LOT	1	5800	$5,800.00
Payment and Performance Bonds	LOT	1	1500	$1,500.00
Mobilization and demobilization.	LOT	2	3600	$7,200.00
TOTAL LUMP SUM PRICE				**$288,810.00**
Unit Prices for Payment Adjustments				
Aggregate pay length (unit price per foot) due to change in length of individual piles or change in the number of piles.			$ 50.00	$50.00
Quantity of pile splices.			$ 150.00	$150.00
Quantity of pile points.			$ 150.00	$150.00

Burns & McDonnell
SINCE 1898
www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827
CONTRACT: 8210 Pilings
BIDDER'S NAME: Industrial Contractors Skanska Revision 1
BID NO: GN-14-018

SUPPLIER PROVIDED ALTERNATES/OPTIONS

The enclosed specifications define requirements associated with materials of construction, components, design methodology, manufacturing and construction methods, etc. Owner encourages suppliers and subcontractors to propose alternate pricing for less costly or better performing alternatives to certain specification requirements when the alternate does not adversely impact the safety, quality, reliability, functionality, or servicing of the item. When proposing alternates, the bidder shall completely define the alternate proposal including the original specification requirement and the estimated cost savings for each alternate.

Description of Alternate	Unit of Measure	Quantity	Unit Price	Extended Price	Alternate Savings

10 Bidder's Checklist: Bidder must indicate as to whether it has provided the following:

		YES	NO
a	Send Proposal as defined in the Commercial terms	x	
b	Clarifications and Exceptions Spreadsheet with Comments	x	
c	Items requested with proposal in Section 013301-A.	x	
d	Completed Division 49 (data to be submitted with bid)	na	
e	Quoted Firm Price Validity for 60 days beyond the bid due date	x	
f	Agrees to net 60 day payment terms	x	
g	Provide anticipated schedule	x	
h	Includes the cost for warranty requirements	x	
i	Have included the cost for a 100% Payment and Performance Bond or LOC	x	

Please use the Clarifications and Exceptions spreadsheet to submit all such responses and submit a redline markup of the commercial terms and conditions documents and appendices.

Burns & McDonnell
SINCE 1898
www.burnsmcd.com

PROJECT: Big Rivers MATS Compliance Project
PROJECT NO. 73827

CONTRACT: 8210 Pilings

BIDDER'S NAME: Industrial Contractors Skanska Revision 1

BID NO: GN-14-018

11 Bidder's Contact for Technical Questions:

Name:	Mike Brooks
Title:	Lead Estimator
Phone No:	(812) 464-7253
Fax No:	(812) 464-9050
Cell No:	(812)484-6519
E-Mail:	mike.brooks@skanska.com

12 Bidder's Contact for Commercial Questions:

Name:	Mike Brooks
Title:	Lead Estimator
Phone No:	(812) 464-7253
Fax No:	(812) 464-9050
Cell No:	(812)484-6519
E-Mail:	mike.brooks@skanska.com

Proposal Date: 26-Mar-14

Name (Typed) Daniel S. Hoefling

Authorized Signature:

Title: Sr. V.P./Gen. Mgr.

END OF BID FORM

Project No.:	**73827 – Big Rivers MATS Compliance Project**
Contract:	**8210 - Pilings**
Bidder :	
Current Date:	

All commercial and technical deviations to the Bid Documents shall be brought to Owner's attention in the form of a clarification or exception at the time Bidder's Proposal is submitted. Scope defined in the Bid Documents defines the Equipment to be provided unless clarifications and exceptions are received and accepted in writing. This form will be used to track and conform all the commercial and technical clarifications and exceptions and document the resolutions, but will not be included in the Contract itself.

Item No.	Page No. / Supplier Item No.	Specification Reference (Section number, page number, paragraph number)	Bidder Clarification / Exception
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011100 - SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section summarizes the Work covered in detail in the complete Contract Documents to give the Contractor a better understanding of the Work required by this Contract. This Section does not place limitation on the amount of Work that may be necessary for the complete procurement and installation specified.

B. Contractor shall be knowledgeable and have experience installing similar types of piling installations. The information included in the Specifications, Contract Drawings and in the Reference Drawings is not intended to be all inclusive of the information required to perform this Work.

C. Owner: Big Rivers Electric Corporation (BREC) is contracting for the Work described in the Contract Documents.

1. Contract Identification: Contract 8210 – Piling
2. Work Site Location:
   a. BREC – Robert D. Green Generating Station:
      9000 Highway 2096
      Robards, KY 42452

D. Engineer: The Contract Documents were prepared by Burns & McDonnell Engineering Company, Inc., 9400 Ward Parkway, Kansas City, Missouri 64114

1.02 PROJECT DESCRIPTION:

A. Description of Project:

1. Big Rivers Electric Corporation (BREC) is installing Dry Sorbent Injection (DSI) and Activated Carbon Injection (ACI) systems for Robert D. Green Generating Station (Green) Units 1 and 2. The addition of the DSI and ACI systems are intended to reduce mercury (Hg) emission to levels compliant with the Mercury and Air Toxic Standards (MATS). DSI systems will be used to reduce SO_3 levels as necessary to improve the Hg removal efficiency of activated carbon.
2. The DSI system will utilize hydrated lime for the reagent, and the ACI system will utilize powdered activated carbon (PAC).

1.03 UNIT OPERATING AND DESIGN PARAMETERS:

A. This Article includes the basic Site/Project information and certain design criteria applicable to the Project. This information is general in nature and may be additionally defined within the technical Specifications. When additionally defined or specified within the technical Specifications, the technical Specification criteria shall control. In the event that additional specific information regarding the Site is required, Contractor shall contact Engineer.

B. Building Code of Record: All Work shall be in accordance with the Kentucky Building Code – 2007 including all appendices, amendments, and reference standard.

1. Wind Design: Per Kentucky Building Code – 2007 to include the following:
   a. 90 MPH Basic Ground Wind Speed at 33 feet above ground (3-second gust)
   b. Wind Importance Factor $I_W = 1.15$
   c. Exposure C
   d. No wind shielding shall be taken into account

e. Design to include Topographic K_{zt} and Directionality K_d Factors as applicable per Code.
f. Structures and equipment to be permanently located indoors shall be design for no less than a 5 psf 'wind' load.

2. Snow Design: Per Kentucky Building Code – 2007 to include the following:
   a. Ground snow load = 15 psf
   b. Snow Importance Factor $I_S = 1.1$
   c. Design to include Exposure C_e and Thermal C_t Factors as applicable per Code.
   d. Design to include drifting increases when applicable due to adjacent structures.
   e. Include rain-on-snow load increase for 'roof' areas sloped less than 1/2 inch per foot.
3. Seismic Design: Per Kentucky Building Code – 2007 to include the following:
   a. Seismic Importance Factor $I_E = 1.25$
   b. Mapped Spectral Accelerations
      (a) Short Period $S_S = 0.851$g, $S_{S,0} = 0.606$g
      (b) 1-second Period $S_1 = 0.240$g, $S_{1,0} = 0.187$g
   c. The soil properties at the Project Site are classified as Site Class D.
   d. Structures and Equipment shall be considered as Occupancy Category III.
4. Ice Loads: Per Kentucky Building Code – 2007 to include the following:
   a. Nominal Ice Thickness t = 0.75 in.
   b. Concurrent Wind Speed $V_c = 30$ mph

C. All Materials for the Project shall comply with the OSHA Regulations and Standards 29CFR1910. If conflicts between Kentucky Building – 2007 and OSHA occur, Kentucky Building Code – 2007 to control. All Work performed on Site shall comply with OSHA Regulations and Standards.

D. All Work and Materials shall be in compliance with local, county, state, federal regulations, codes, standards, laws, and ordinances.

E. Site Conditions:
1. Elevation:
   a. Approximately 412 ft above mean sea level (MSL).
2. Climatology:
   a. Extreme Temperatures:
      (a) Maximum Dry Bulb: 108 °F
      (b) Minimum Dry Bulb: -23 °F
   b. Design Conditions: (ASHRAE)
      (a) Summer (1% coincident): 90.9 °Fdb/76.2 °Fwb
      (b) Winter (99%): 15 °F
      (c) Design Relative Humidity 89%
   c. Plant Site Frost Depth: Per Kentucky Building Code – 2007, a minimum depth of 24 in. or erecting on solid rock. Actual minimum depth to be determined by the Geotechnical investigation.
   d. Precipitation:
      (a) Average Annual Rainfall: 45.5 inches
      (b) Design Storm (24 hour): (US Department of Commerce/US Weather Bureau - Technical Paper 40).

Duration	10-year Return Period	25-year Return Period	100-year Return Period
24 hour	4.3 inches	5.2 inches	6.1 inches

1.04 WORK COVERED BY CONTRACT DOCUMENTS:

A. Furnish all construction labor, supervision, equipment, tools, rigging, blocking, scaffolding, material, supplies, transportation, project management, construction management (including scheduling and cost control), and services necessary to:

1. Furnish and install all foundation piling (steel H-piles) for this Project.
2. Perform all pile cut-offs at elevation(s) indicated in the Contract Documents.
3. Subcontract with Dynamic Testing Consultant to perform all dynamic pile testing.
4. Furnish and install tension uplift straps and studs for all tension piles.
5. Furnish and install pile points.
6. Perform pile splicing and provide related materials to perform the splice, including welding, as needed.
7. Receive, unload, store, secure, and install all test piling and production piling.
8. Provide project management, construction management, and supervision, including scheduling and cost control.
9. Obtain all local building and construction permits and pay all contractor fees and inspection fees required by local authorities.
10. Piling is to be installed adjacent to an existing slope. Precautions shall be taken when installing piling in this area.

1.05 WORK BY OTHERS:

A. Work Under Other Contracts:

1. Contract 8110 – Site Preparation and Foundations. This contract will perform site preparation, installation of foundations, and underground utilities.
2. Contract 8320 –General Construction. This contract will erect all equipment, piping, structural steel, siding, roofing, and the power control module. This contract will also furnish and install cable and raceway for all equipment, instrumentation, and controls.

B. Work by Owner:

1. Owner will contract with others for site and subsurface preparation prior to mobilization of this Contract. This work by others will include saw cutting and removing existing asphalt in the construction area, excavation of subgrade to driving surface (bottom of concrete mat), and an optional ramp if needed for access into the excavation.

1.06 CONTRACTOR'S USE OF PREMISES:

A. Limited Use:

1. Limit use of the premises for storage and execution of the Work to allow for Owner occupancy. Confine operations to areas within Contract limits indicated. Portions of Site outside the Contract limits shall not be disturbed.
2. Coordinate with other separate contractors and Owner to avoid interference of operations.
3. Conduct operations so as to ensure the least inconvenience to Owner.

1.07 OWNER'S USE OF PREMISES:

A. Full Owner Occupancy: The Owner will occupy the Site and existing building during the entire construction period. Cooperate with the Owner during construction operations to

minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with the Owner's operations.

1.08 SUBSURFACE INFORMATION:

A. Certain subsurface information has been otainined at, or in the vicinity of, the Site of the Work.
B. Copies of such subsurface information will be issued only to prospective Bidders who request such subsurface information and sign a receipt therefor.
C. There is no express or implied guarantee as to the accuracy or completeness of the subsurface information, nor of the interpretation thereof by the Owner, Engineer, or any of their representatives.
D. The subsurface information or copies thereof do not form a part of this or any contract document issued by the Owner or Engineer.

1.09 WORK SEQUENCE:

A. General: Construction sequence shall be determined by Contractor subject to Owner's need for continuous operation of existing facilities.
B. Continuous Service of Existing Facilities: Exercise caution and schedule operations to ensure that functioning of present facilities will not be disrupted. Shutdown of Owner's operating facilities to perform the Work shall be held to a minimum length of time and shall be coordinated with Engineer and Owner who shall have control over the timing and schedules of such shutdowns.
C. In order to facilitate installation of the retaining wall (furnished and installed by others), the piling work shall be performed in two phases: Phase 1 and Phase 2. Contractor shall coordinate mobilization and demobilization activities accordingly.
D. Scheduled Events: Schedule the Work to conform to the following events and dates.

1.	Notice to proceed: Pilings	07 April 2014
2.	Pilings Contractor mobilization Phase 1 complete:	28 April 2014
3.	Installation of pilings Phase 1 complete:	19 May 2014
4.	Pilings Contractor mobilization Phase 2 complete:	21 July 2014
5.	Installation of pilings Phase 2 complete:	25 July 2014
6.	Anticipated Substantial Completion:	28 July 2014
7.	Final Completion:	4 August 2014

1.10 MEASUREMENT AND PAYMENT:

A. Lump Sum Contracts: All Work indicated and specified in the Contract Documents shall be included in the Lump Sum Contract Price.
B. Change Orders and Payment Procedures: Stated in RUS FORMS.

1.11 COPIES OF DOCUMENTS:

A. Furnished Copies: After execution of Agreement, Contractor will be furnished at no cost, two original sets of Contract Documents consisting of full-size Contract Drawings including revised Drawings, and the Project Manual, in addition to those used in execution of the Agreement. Contractor will also be furnished one electronic PDF file of the Contract Documents.

1.12 LIST OF DRAWINGS:

A. Contract Drawings:
1. Individual sheet numbers and titles are as stated on Table of Contents under "Contract Drawings".

B. Reference Drawings:
   1. Reference Drawings included are as stated in the Table of Contents under "Reference Drawings".

1.13 PROJECT RECORD DOCUMENTS:

A. General: In addition to documentation required by the Contract Documents, maintain at the Contractor's facilities (and at installation Site) one record copy of:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to the Contract.
   5. Approved Shop Drawings, product data, and Samples.

B. Recording:
   1. Label each document "PROJECT RECORD" in neat, large, printed letters.
   2. Record information concurrently with fabrication or Field Services progress.
   3. Record Drawings: Legibly mark to record actual construction:
      a. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
      b. Field changes of dimension and detail.
      c. Changes made by Change Order or other Modifications. Note related Change Order numbers where applicable.
      d. Details not on original Contract Drawings.
   4. Record Specifications and Addenda: Legibly mark each Section to record:
      a. Manufacturer, trade name, catalog number, and Supplier of each product and item of Equipment actually furnished, particularly optional and substitute items.
      b. Changes made by Addendum, Change Order, or other modifications.
      c. Related Submittals.
   5. Record Product Data: Maintain one copy of each product data Submittal, and mark-up significant variations in actual Work in comparison with submitted information.
      a. Include both variations in product as delivered to Point of Delivery, and variations from manufacturer's instructions and recommendations for installation.
   6. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily observed. Note related Change Orders and mark-up of record drawings and specifications.
   7. Upon completion of the Work, submit record drawings to Engineer for Owner's records.
      a. Include the following:
         (1) Depths of various elements of foundation in relation to finish first floor datum.
         (2) Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
         (3) Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.
         (4) Where Submittals are used for mark up, record a cross reference at corresponding location on Drawings.
         (5) Field changes of dimension and detail.
         (6) Changes made by Change Order or other Modifications.
         (7) Details not on original Contract Drawings.

PART 2 - PRODUCTS - Not Applicable.

SECTION 011100 - SUMMARY OF WORK: continued

PART 3 - EXECUTION – Not Applicable.

END OF SECTION 011100

SECTION 013100 - PROJECT COORDINATION AND MEETINGS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. Coordination drawings.
   2. Project meetings.
   3. Requests for information (RFIs).

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Work Specified Elsewhere:
   1. For preparing and submitting Contractor's construction progress schedule: SECTION 013200.
   2. For Submittal Requirements: SECTION 013300.

1.02 DEFINITIONS:

A. RFI: Request for information prepared by Contractor and submitted to Engineer seeking interpretation or clarification of the Contract Documents.

1.03 COORDINATION:

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors, Owner, and other entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
   1. Where availability of space is limited, coordinate installation of different components to allow optimum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of others to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of construction progress schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of Submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
   8. Startup and adjustment of systems.
   9. Project closeout activities.

1.04 PROJECT MEETINGS:

A. Preconstruction Conference:
   1. Engineer will conduct a meeting within 10 days after the Effective Date of the Agreement, to review items stated in the following agenda and to establish a working understanding between the parties as to their relationships during performance of the Work.
   2. Preconstruction conference shall be attended by:
      a. Representative(s) of Contractor including Contractor's superintendent.
      b. Engineer.
      c. Representative(s) of Owner.
      d. At Engineer or Owner's option, representatives of principal Subcontractors and Suppliers.
   3. Meeting Agenda:
      a. Construction schedules.
      b. Phasing.
      c. Critical Work sequencing and long-lead items.
      d. Designation of key personnel and their duties; lines of communication.
      e. Project coordination.
      f. Procedures and Processing of:
         (1) RFIs.
         (2) Field decisions.
         (3) Substitutions.
         (4) Submittals.
         (5) Change Orders.
         (6) Applications for Payment.
      g. Procedures for testing.
      h. Procedures for preparing and maintaining record documents.
      i. Use of Premises:
         (1) Office, work, storage, laydown, and parking areas.
         (2) Owner's requirements.
         (3) Work restrictions and hours.
      j. Construction facilities, controls, and construction aids.
      k. Temporary utilities.
      l. Safety and first-aid.
      m. Security.
      n. Deliveries of Equipment and Materials.
   4. Location of Meeting: At the Project Site.
   5. Reporting:
      a. Within three working days after the meeting, Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.
      b. Contractor shall provide copies to Subcontractors and major Suppliers.

B. Coordination Schedules:
   1. Engineer will conduct a meeting at least ten days before submission of the first Application for Payment to finalize the initial coordination schedules requested under SECTION 013200 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS.
   2. The meeting shall be attended by:
      a. Representative(s) of Contractor including Contractor's superintendent (and scheduler).

b. At Engineer or Owner's option, representatives of principal Subcontractors and Suppliers.
c. Engineer.
d. Representative(s) of Owner.

C. Construction Progress Meetings:
1. Engineer will schedule and conduct a meeting at least weekly and at other times requested by Engineer. Representatives of the Owner, Engineer, and Contractor shall be present at each meeting. With Engineer's concurrence, Contractor may request attendance by representatives of Subcontractors, Suppliers, or other entities concerned with current program or involved with planning, coordination, or performance of future activities. All participants in the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. Contractor and each Subcontractor represented shall be prepared to discuss the current construction progress report and any anticipated future changes to the schedule. Each Subcontractor shall comment on the schedules of Contractor and other Subcontractors and advise if their current progress or anticipated activities are compatible with that Subcontractor's Work.
3. If one Subcontractor is delaying another, Contractor shall issue such directions as are necessary to resolve the situation and promote construction progress.
4. Meeting Agenda:
a. Review of construction progress since previous meeting.
b. Field observations, interface requirements, conflicts.
c. Issues which may impede construction schedule.
d. Off-Site fabrication.
e. Delivery schedules.
f. Submittal schedules and status.
g. Site use; coordination with other contractors.
h. Temporary facilities, controls, and services.
i. Hours of Work.
j. Hazards and risks.
k. Housekeeping.
l. Quality and Work standards.
m. RFIs.
n. Status of Change Orders.
o. Documentation of information for payment requests.
p. Corrective measures and procedures to regain construction schedule if necessary.
q. Revisions to construction schedule.
r. Review of proposed activities for succeeding Work period.
s. Review proposed Contract modifications for:
(1) Effect on construction schedule and on completion date.
(2) Effect on other contracts of the Project.
t. Other business.
5. Location of Meetings: At Project Site.
6. Reporting:
a. Engineer will prepare and distribute minutes of the meeting to Owner and Contractor.
b. Contractor shall distribute copies to principal Subcontractors and Suppliers.

D. Multiple Contract Coordination Meetings:

1. Engineer may conduct coordination meetings to be attended by Owner's representative(s) and prime contractors at the Site. Contractor shall participate in such conferences, accompanied by Subcontractors as requested by Engineer.
2. Agenda will be similar to that stated above for construction progress meetings.
3. Location of Meetings: At the Project Site.
4. Reporting:
   a. Engineer will prepare and distribute minutes of the meeting to Owner and contractors.
   b. Contractors shall distribute copies to affected Subcontractors and Suppliers.

1.05 REQUESTS FOR INFORMATION (RFIs):

A. Procedure: Promptly on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI with the content specified.
   1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's Work or work of Subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
   1. Project name.
   2. Date.
   3. Name of Contractor.
   4. Contract number and title.
   5. Name of Engineer.
   6. RFI number, numbered sequentially.
   7. Specification Section number and title and related paragraphs, as appropriate.
   8. Drawing number and detail references, as appropriate.
   9. Field dimensions and conditions, as appropriate.
   10. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Times or the Contract Price, Contractor shall state impact in the RFI.
   11. Contractor's signature.
   12. Attachments: Include drawings, descriptions, measurements, photos, product data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

C. Hard-Copy RFIs:
   1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Engineer's Action: Engineer will review each RFI, determine action required, and return it. Allow seven days for Engineer's response for each RFI. RFIs received after 1:00 p.m. local time will be considered as received the following working day.
   1. The following RFIs will be returned without action:
      a. Requests for approval of Submittals.
      b. Requests for approval of substitutions.
      c. Requests for coordination information already indicated in the Contract Documents.
      d. Requests for adjustments in the Contract Times or the Contract Price.
      e. Requests for interpretation of Engineer's actions on Submittals.
      f. Incomplete RFIs or RFIs with numerous errors.

2. Multiple RFIs addressing similar or identical issues may be addressed by Engineer with a single broad response.
3. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again upon Contractor's response and resubmittal.
4. If Contractor believes the RFI response warrants change in the Contract Times or the Contract Price, notify Engineer in writing within five days of receipt of the RFI response.

F. On receipt of Engineer's action, update the RFI log and promptly distribute the RFI response to affected parties. Review response and notify Engineer within five days if Contractor disagrees with response.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION - Not Applicable.

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Construction progress schedule.
   2. Schedule of Submittals.
   3. Construction progress reports.
   4. Daily construction reports.
   5. Equipment and Material location reports.
   6. Field condition reports.
   7. Special reports.

B. Related Work Specified Elsewhere:
   1. For submitting and distributing meeting and conference minutes: SECTION 013100 - PROJECT COORDINATION AND MEETINGS.
   2. For submitting schedules and reports: SECTION 013300 - SUBMITTALS.

1.02 REFERENCES:

A. Associated General Contractor's of America (AGC):
   1. Construction Planning and Scheduling.

1.03 DEFINITIONS:

A. Activity: A discrete part of a contract that can be identified for planning, scheduling, monitoring, and controlling the construction Work. Activities included in a construction schedule consume time and resources, but shall not include planned work stoppages. Activities shall not normally reflect the Work of more than one trade.
   1. Critical activities are activities on the critical path and have zero or negative float. Critical activities must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. "Baseline" schedule: The schedule submitted and accepted by Engineer for the Work.

C. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Price, unless otherwise approved by Engineer.

D. CPM: Critical path method (CPM), which is a method of planning and scheduling a construction contract where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Contract.

E. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Contract duration and contains no float.

F. Event: The starting or ending point of an activity. An event has no duration.

G. Float: The measure of leeway in starting and completing an activity.
   1. Float time belongs to Owner.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting an intermediate deadline or the planned Contract completion date.

H. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

I. Milestone: A key or critical point in time for reference or measurement. A milestone has no duration.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.04 SUBMITTALS:

A. Schedule of Submittals: Submit in specified electronic format. Arrange the following information in a tabular format:
   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (technical or informational).
   4. Name of Subcontractor or Supplier.
   5. Description of the Work covered.
   6. Scheduled date for Engineer's final release or approval.

B. Preliminary Construction Progress Schedule: Submit in specified electronic format.
   1. Acceptance of cost-loaded preliminary construction schedule will not constitute acceptance of schedule of values for cost-loaded activities.

C. Preliminary Network Diagram: Submit in specified electronic format, large enough to show entire network for entire construction period. Show logic ties for activities.

D. Construction Progress Schedule: Submit initial schedule, large enough to show entire schedule for entire construction period to Engineer for review and acceptance.
   1. Submit electronically, using software indicated, labeled to comply with requirements for Submittals. Include type of schedule (Initial or Updated) and date.

E. CPM Reports: Concurrent with CPM schedule, submit electronically each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
   1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
   2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
   3. Total Float Report: List of all activities sorted in ascending order of total float.
   4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment. Review of planned, earned, and spent earned value analysis.

F. Schedule of Values: Submit with initial construction progress schedule to Engineer for review and approval in specified electronic format.

G. Construction Progress Reports: Submit electronically at weekly intervals.

H. Daily Construction Reports: Submit electronically at weekly intervals.

I. Material Location Reports: Submit electronically at weekly intervals.

J. Field Condition Reports: Submit electronically at time of discovery of differing conditions.

K. Special Reports: Submit electronically at time of unusual event.

1.05 QUALITY ASSURANCE:

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Engineer's request.

B. Prescheduling Conference: Conduct conference at Project Site to comply with requirements in SECTION 013100 - PROJECT COORDINATION AND MEETINGS. Review methods and procedures related to the preliminary construction schedule and "baseline" construction progress schedule, including, but not limited to, the following:
   1. Review software limitations and content and format for reports.
   2. Verify availability of qualified personnel needed to develop and update schedule.
   3. Discuss constraints, including phasing, work stages, area separation, interim milestones, and Owner occupancy.
   4. Review schedule for work of Owner's separate contracts.
   5. Review time required for review of Submittals and resubmittals.
   6. Review requirements for tests and inspections by independent testing and inspecting agencies.
   7. Review and finalize list of construction activities to be included in schedule.
   8. Review Submittal requirements and procedures.
   9. Review procedures for updating schedule.

1.06 COORDINATION:

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate construction progress schedule with the schedule of values, list of subcontracts, schedule of Submittals, Material and Equipment procurement, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from parties involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.01 SCHEDULE OF SUBMITTALS:

A. Preparation: Submit a schedule of Submittals, arranged in chronological order by dates required by construction progress schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates as required in SECTION 013300 - SUBMITTALS.
   1. Coordinate Submittals schedule with list of subcontracts, the schedule of values, and "Baseline" construction progress schedule.
   2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include Submittals required during the first 30 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
   3. Final Submittal: Submit concurrently with the first complete submittal of construction progress schedule.

2.02 CONTRACTOR'S CONSTRUCTION PROGRESS SCHEDULE, GENERAL:

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established in the Notice to Proceed to date of Final Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each building floor or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 30 calendar days, unless specifically allowed by Engineer.
   2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, Submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in SECTION 013300 - SUBMITTALS in schedule. Coordinate Submittal review times in Contractor's construction progress schedule with schedule of Submittals.
   4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work under More Than One Contract: Include a separate activity for each contract.
   3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
   4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in SECTION 011100 - SUMMARY OF WORK. Delivery dates indicated stipulate the earliest possible delivery date.
   5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in SECTION 011100 - SUMMARY OF WORK. Delivery dates indicated stipulate the earliest possible delivery date.
   6. Work Restrictions: Show the effect of the following items on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Use of premises restrictions.
      e. Provisions for future construction.
      f. Seasonal variations.
      g. Environmental control.
   7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
      a. Subcontract awards.
      b. Submittals.
      c. Purchases.
      d. Fabrication.
      e. Sample testing.

f. Deliveries.
g. Installation.
h. Tests and inspections.
i. Adjusting.
j. Curing.
k. Placement into final use and operation.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
1. Assign cost to construction activities on the CPM schedule. Costs shall not be assigned to Submittal activities unless specified otherwise but may, with Engineer's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable).
2. Each activity cost shall reflect an accurate value subject to acceptance by Engineer.
3. Total cost assigned to activities shall equal the total Contract Price.

G. Contract Modifications: For each proposed Contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall schedule.

H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules and is acceptable to Engineer:
1. Primavera Project Planner (P3).
2. Primavera 3e.
3. Primavera 5.0.
4. SureTrak.
5. Engineer-approved equal.

2.03 CONSTRUCTION PROGRESS SCHEDULE (CPM SCHEDULE):

A. General: Prepare network diagrams using:
1. AON (activity-on-node) format.
2. Precedence Diagramming Method (PDM).

B. Preliminary Network Diagram: Submit diagram within seven days of Notice to Proceed. Outline significant construction activities for the duration of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare detailed construction progress schedule using a computerized time-scaled CPM network analysis diagram for the Work.
1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use as the "baseline" schedule no later than 7 days after Notice to Proceed.
a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all Work within the Contract Times, regardless of Owner's and Engineer's acceptance of the "baseline" schedule.
b. Prior to acceptance of the "baseline" schedule, progress payment requests will be approved based on Work-in-place estimates by Owner and Engineer.
c. No progress payment will be made after the second month of the Contract Times unless the "baseline" CPM schedule is submitted as specified.

d. No progress payment will be made after the third month of the Contract Times unless the "baseline" CPM schedule is accepted by Engineer and Owner.

2. Conduct educational workshops to train and inform key Project personnel, including Subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one 8-hour workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Assign each activity a number.
   a. Assign numbering such that predecessor activity numbers are smaller numerically than successor activity numbers.
   b. Use even-numbered activities for base Contract Work, and odd-numbered activities for Change Order work.
2. Include estimated time frames for the following activities:
   a. Preparation and processing of Submittals.
   b. Mobilization and demobilization.
   c. Purchase of Equipment and Materials.
   d. Delivery.
   e. Fabrication.
   f. Utility interruptions.
   g. Installation.
   h. Work by Owner that may affect or be affected by Contractor's activities.
   i. Startup and initial operations.
   j. Performance and guarantee testing.
3. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
4. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Times.
5. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
   a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
6. Float: Contractor shall not use artificial activity durations, preferential logic, or other devices for sequestering float. Owner retains the right to reject any schedule submittal in which Contractor has sequestered float.

E. Initial "Baseline" Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports in hardcopy and electronic formats showing the following:

1. Contractor or Subcontractor and the Work or activity.
   a. Assign responsibility codes to all parties responsible for an activity.
2. Description of activity.
   a. To fully describe Work to be performed.

b. To indicate hammocks and milestones.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

F. Schedule Updating:
1. Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
a. Identification of activities that have changed.
b. Changes in early and late start dates.
c. Changes in early and late finish dates.
d. Changes in activity durations in workdays.
e. Changes in the critical path.
f. Changes in total float or slack time.
g. Changes in the Contract Times.
2. A final "as-constructed" schedule with actual sequence and start and finish dates for activities shall be provided to Engineer, with other specified record documents as a condition precedent to final payment.

G. Three-Week Look-Ahead Schedule: Prepare and issue on a weekly basis to indicate all planned Work for performance during the current week and the subsequent two-week interval.
1. Bar-chart format listing activities that are in progress from previous week or will begin within three weeks of the current status date.
2. Manpower loaded, sufficient to direct craft efforts day-to-day.
3. Include activities that are required to be completed by others which may impact the start or completion of planned activities.
4. Coordinate with complete CPM schedule with regard to phases and milestones.

2.04 REPORTS:

A. Construction Progress Reports:
1. Submit a report on actual construction progress on a weekly basis. More frequent reports may be required should the Work fall behind the accepted schedule.
a. Submit a weekly report to coordinate with and supplement the monthly construction progress report and which details Work scheduled for the following one-week interval, including:
(1) Work activities which will occur.
(2) Number and size of crews.
(3) Construction equipment on Site.
(4) Major items of Equipment and Material to be installed.
b. Format shall be on electronic.
2. Construction progress reports shall consist of the revised construction progress schedule and a narrative report which shall include but not be limited to the following:
a. Comparison of actual progress to planned progress shown on originally accepted schedule.
b. Summary of activities completed since the previous construction progress report.
c. Summary of activities planned for next reporting period.

d. Planned, earned, and spent earned value analysis for the month.
e. Identification of problem areas.
f. A description of current and anticipated delaying factors, if any.
g. Impact of possible delaying factors.
h. Proposed corrective actions.

3. Submit a construction progress report to Engineer with each application for partial payment. Work reported complete but not readily apparent to Engineer must be substantiated with supporting data when requested by Engineer.
4. If a schedule update reveals that, through no fault of Owner, the Work is likely to be completed later than the Contract completion date, Contractor shall:
   a. Establish a plan for making up lost time.
      (1) Increase number of workers, or
      (2) Increase amount or kinds of tools, or
      (3) Work overtime or additional shifts, or
      (4) A combination of 2 or more of the above 3 actions.
   b. Submit plan to Owner and Engineer before implementing the plan.
   c. Take actions as necessary to get the Work back on schedule at no additional cost to Owner.

B. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project Site:
1. List of Subcontractors at Project Site.
2. List of separate contractors at Project Site.
3. Approximate count of personnel at Project Site, and breakdown by craft.
4. Equipment at Project Site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.

C. Equipment and Material Location Reports: At weekly intervals, prepare and submit a comprehensive list of Equipment and Materials delivered to and stored at Project Site. List shall be cumulative, showing Equipment and Materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for Materials or items of Equipment fabricated or stored away from Project Site.

D. Field Condition Reports: Promptly on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for information (RFI). Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

E. Special Reports:
1. General: Submit special reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
2. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project Site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.01 CONSTRUCTION PROGRESS SCHEDULE:

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
   1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
   2. Meetings: Scheduling consultant shall attend all meetings related to construction progress, alleged delays, and time impact.

B. Construction Progress Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled construction progress meeting.
   1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
   2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate actual completion percentage for each activity.

C. Distribution: Distribute copies of accepted schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 013200

SECTION 013300 - SUBMITTALS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes definitions, descriptions, transmittal, and review of Submittals.

B. Related Work Specified Elsewhere:

1. SECTION 013100 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS.
2. SECTION 017800 - CONTRACT CLOSEOUT.

1.02 GENERAL INFORMATION:

A. Definitions:

1. Shop Drawings, product data, and Samples are technical Submittals prepared by Contractor, Subcontractor, manufacturer, or Supplier and submitted by Contractor to Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe installation, operation, maintenance, or technical properties, as specified in each Division of the Specifications.
   a. Shop Drawings include custom-prepared data of all types including drawings, diagrams, performance curves, material schedules, templates, instructions, and similar information not in standard printed form applicable to other projects.
   b. Product data includes standard printed information on materials, products, and systems; not custom-prepared for this Project, other than the designation of selections from available choices.
   c. Samples include both fabricated and unfabricated physical examples of materials, products, and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis. Mock-ups are a special form of Samples which are too large to be handled in the specified manner for transmittal of Sample Submittals.
   d. Descriptions of submittal requirements (as applicable) are defined in Appendix B – Submittal Descriptions.
2. Informational Submittals are those technical reports, administrative Submittals, certificates, and guarantees not defined as Shop Drawings, product data, or Samples.
   a. Technical reports include laboratory reports, tests, technical procedures, technical records, and Contractor's design analysis.
   b. Administrative Submittals are those nontechnical Submittals required by the Contract Documents or deemed necessary for administrative records. These Submittals include maintenance agreements, Bonds, Project photographs, physical work records, statements of applicability, copies of industry standards, Project record data, schedules, security/protection/safety data, and similar type Submittals.
   c. Certificates and guarantees are those Submittals on Equipment and Materials where a written certificate or guarantee from the manufacturer or Supplier is called for in the Specifications.
3. Refer to ARTICLES 1.03 and 1.04 of this Part for detailed lists of Submittals and specific requirements.

B. Quality Requirements:

1. Submittals such as Shop Drawings and product data shall be of suitable quality for legibility and reproduction purposes. Every line, character, and letter shall be clearly legible. Drawings such as reproducibles shall be useable for further reproduction to yield legible hard copy.

2. Documents submitted to Engineer that do not conform to specified requirements shall be subject to rejection by Engineer, and upon request by Engineer, Contractor shall resubmit conforming documents. If conforming Submittals cannot be obtained, such documents shall be retraced, redrawn, or photographically restored as may be necessary to meet such requirements. Contractor's (or their Subcontractor's) failure to initially satisfy the legibility quality requirements will not relieve Contractor (or their Subcontractors) from meeting the required schedule for Submittals.

C. Language and Dimensions:
   1. All words and dimensional units shall be in the English language.
   2. Metric dimensional unit equivalents may be stated in addition to the English units. However, English units of measurement shall prevail.

D. Submittal Completeness:
   1. Submittals shall be complete with respect to dimensions, design criteria, materials of construction, and other information specified to enable Engineer to review the information effectively.
   2. Where standard drawings are furnished which cover a number of variations of the general class of Equipment, each drawing shall be annotated to indicate exactly which parts of the drawing apply to the Equipment being furnished. Use hatch marks to indicate variations that do not apply to the Submittal. The use of "highlighting markers" will not be an acceptable means of annotating Submittals. Annotation shall also include proper identification of the Submittal permanently attached to the drawing.
   3. Reproductions or copies of Contract Drawings or portions thereof will not be accepted as complete fabrication or erection drawings. Contractor may use a reproduction of Contract Drawings for erection drawings to indicate information on erection or to identify detail drawing references. Whenever the Drawings are revised to show this additional Contractor information, Engineer's title block shall be replaced with Contractor's title block, and Engineer's professional seal shall be removed from the drawing. Contractor shall revise these erection drawings for subsequent Engineer revisions to the Contract Drawings.

E. Form of Submittals:
   1. Submittals and other Project documents shall be transmitted in electronic format as specified.
      a. Selected Submittals may be provided in paper ("hardcopy") copies with advance approval of Engineer, and using procedures specified herein.
      b. Equipment instruction books and operating manuals shall be provided in paper copies in addition to specified electronic format.
   2. Electronic Format using Engineer's Document Management System:
      a. Scanned Submittals and documents are not acceptable. Transmit Submittal and Project documents in:
         (1) Adobe *PDF files created directly from native electronic format, or
         (2) Engineer-approved equal.
         (3) Electronic Submittals in .tif format are permitted only with specific Engineer approval.
      b. Each drawing shall be submitted with an electronic filename that is equivalent to the drawing number, and any resubmitted drawing shall use the same filename as the original file name each time.
      c. Contractor Submittals shall be accompanied with a completed transmittal letter. Submittals that are not accompanied with an approved transmittal letter will not be accepted and will be returned to Contractor.

d. All Contractor transmittal letters submitted to Engineer shall be in the form supplied and shall contain as a minimum the following information:
   (1) Contractor's Name.
   (2) Engineer's Project number.
   (3) Engineer's Contract number.
   (4) Filename.
   (5) Description of the information contained in the specific Submittal.
   (6) Revision number.
   (7) Submittal type.
   (8) Date of Submittal.

e. Nonconforming Submittals are subject to rejection by Engineer.

f. Provide "as-constructed" Submittals, record documents, Equipment instruction books and operating manuals, and other documents on CD-ROM in the latest version of AutoCAD format or as required and approved by Owner.

3. Engineer's review comments will be provided electronically in Adobe *PDF format.

4. Digital delivery media for transmittal of electronic documents and Submittals shall be through Engineer's Document Management (DM) Project website in accordance with the procedures specified herein, as addressed below. More information will be provided in the pre-construction conference for this Contract.

   a. DM guidelines and procedures:
      (1) Contractor shall complete the DM transmittal letter spreadsheet (provided by Engineer after award), package Submittals in one ZIP file, and upload transmittal to the DM website.
      (2) Contractor shall collect and download reviewed Submittals after notification from Engineer that the reviewed Submittals have been posted to the DM website.
      (3) A confirmation email is automatically distributed to Contractor after a successful upload to the DM website. If a confirmation email is not received by Contractor, a potential error has occurred; and Contractor shall contact Engineer.

   b. Refer to Appendix 013300-D for summary of DM System.

1.03 TECHNICAL SUBMITTALS:

A. Items shall include, but not be limited to, the following:
   1. All items listed in the technical sections of DIVISION 31 – EARTHWORK.
   2. Manufacturer's specifications.
   3. Name of piling subcontractor and experience qualifications for installation of steel H-piles.
   4. Name of Dynamic Testing Consultant and experience qualifications for dynamic pile testing.
   5. Details of proposed piles and pile-driving equipment.
   6. Pile driving layout and sequence plan.
   7. Steel H-pile, reinforcing steel, pile point, pile splice, and related shop fabrication drawings.

B. Schedule of Submittals:
   1. Prepare for Engineer's concurrence, a schedule for submission of all Submittals specified or necessary for Engineer's approval of the use of Equipment and Materials proposed for incorporation in the Work or needed for proper installation, operation, or maintenance.

Submit the schedule with the procurement schedule and construction progress schedule. Schedule submission of all Submittals to permit review, fabrication, and delivery in time so as to not cause a delay in the Work of Contractor or his Subcontractors or any other contractors as described in the Contract Documents.

2. In establishing schedule for Submittals, allow 7 days in Engineer's office for reviewing original Submittals and 7 days in Engineer's office for reviewing resubmittals.
3. Submittals requiring revision shall be resubmitted within 7 days after receipt of Engineer's review notations.
4. The schedule shall indicate the anticipated dates of original submission for each item and Engineer's approval thereof, and shall be based upon at least one resubmission of each item.
5. Schedule all Submittals required prior to fabrication or manufacture for submission within 5 days of the Notice to Proceed. Schedule Submittals pertaining to storage, installation, and operation at the Site for Engineer's approval prior to delivery of the Equipment and Materials.
6. Resubmit Submittals the number of times required for Engineer's "Submittal Approved." However, any need for resubmittals in excess of the number set forth in the accepted schedule, or any other delay in obtaining approval of Submittals, will not be grounds for extension of the Contract Times, provided Engineer completes his reviews within the times specified.
7. Where a Submittal is required by the Contract Documents or the accepted schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertaining Submittal will be at the sole expense and responsibility of Contractor.

C. Transmittal of Submittals:
   1. All Submittals for Equipment and Materials furnished by Contractor, Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor.
   2. After checking and verifying all field measurements, transmit all Submittals to Engineer for approval as follows:
      a. Submittal Information Block:
         (1) Affix to all paper copies whether Submittal is prepared by Contractor, Subcontractor, or Supplier. Use transparent decal type Submittal Information Blocks for Shop Drawings and use gummed paper type for product data and Sample Submittals. All Submittal Information Blocks needed for this Contract will be furnished to Contractor at no charge at the initial coordination conference.
         (2) Electronic files of Submittal Information Blocks will be provided to Contractor for use on electronic Submittals.
      b. Mark each Submittal by Project name and number, Contract title and number, and applicable Specification Section and Article number. Include in the letter of transmittal the Drawing number and title, sheet number (if applicable), revision number, and electronic filename (if applicable). Unidentifiable Submittals will be returned for proper identification.
      c. Check and approve Submittals of Subcontractors, Suppliers, and manufacturers prior to transmitting them to Engineer. Contractor's submission shall constitute a representation to Owner and Engineer that Contractor approves Submittals and has determined and verified all design criteria, quantities, dimensions, field construction and installation criteria, materials, catalog numbers, compliance with Laws and Regulations, and similar data, and Contractor assumes full responsibility for doing

so; and Contractor has coordinated each Submittal with the requirements of the Work and the Contract Documents.

d. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from requirements of the Contract Documents.

e. Make all modifications noted or indicated by Engineer and return the required number of revised Submittals until approved. Direct specific attention in writing, or on revised Submittals, to changes other than the modifications called for by Engineer on previous Submittals. After paper copy Submittals have been approved, submit copies thereof for final distribution. Previously approved Submittals transmitted for final distribution will not be further reviewed and are not to be revised. If errors are discovered during manufacture or fabrication, correct the Submittal and resubmit for review.

f. Following completion of the Work and prior to final payment, furnish record documents and approved Samples and Shop Drawings necessary to indicate "as constructed" conditions, including field modifications, in the number of copies specified. Furnish additional copies for insertion in Equipment instruction books and operating manuals as required. All such copies shall be clearly marked "PROJECT RECORD."

(1) Submit a final record copy of the Master Field Drawing list which shall indicate the final revision status of each drawing on the list.

g. Keep a copy or sample of each Submittal in good order at the Site.

3. Quantity Requirements:

a. Except as otherwise specified, transmit all Shop Drawings in the following quantities:

(1) Initial Submittal:

(a) Electronic - One copy to Engineer.

(2) Resubmittals:

(a) Electronic - One copy to Engineer.

(3) Submittal for final distribution:

(a) Paper – Two copies plus the number required by Contractor, to Engineer.

(b) Electronic - One copy to Engineer.

(4) As-constructed documents:

(a) Paper - Four copies to Engineer.

(b) Electronic - One copy to Engineer and one copy to Owner.

b. Transmit Submittals of product data as follows:

(1) Initial Submittal:

(a) Electronic - One copy to Engineer.

(2) Resubmittals:

(a) Electronic - One copy to Engineer.

(3) Submittal for final distribution:

(a) Electronic - One copy to Engineer.

c. When all Submittals have been updated to "as-constructed" conditions, transmit to Engineer and to Owner in electronic format.

d. Owner may copy and use for internal operations and staff training purposes any and all document Submittals required by this Contract and approved for final distribution, whether or not such documents are copyrighted, at no additional cost to Owner. If permission to copy any such Submittal for the purposes stated is unreasonably withheld from Owner by Contractor or any Subcontractor,

manufacturer, or Supplier, Contractor shall provide to Engineer 20 copies plus the number of copies required by Contractor at each final distribution issue.

4. Equipment erection drawings and other Submittals required for installation of Equipment furnished by others under separate contract for installation under this Contract will be transmitted to Contractor by Engineer in the final distribution of such Submittals.
5. Information to Manufacturer's District Office: Contractor shall arrange for manufacturers and Suppliers of Equipment and Materials to furnish copies of all agreements, drawings, specifications, operating instructions, correspondence, and other matters associated with this Contract to the manufacturer's district office servicing Owner. Insofar as practicable, all business matters relative to Equipment and Materials included in this Contract shall be conducted through such local district offices.

D. Engineer's Review:
1. Engineer will review and take appropriate action on Submittals in accordance with the accepted schedule of Submittals. Engineer's review and approval will be only to determine if the items of Equipment and Materials covered by the Submittals will, after installation or incorporation in the Work, conform to information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to design data reflected in Submittals which is peculiarly within the special expertise of Contractor or Contractor's Subcontractors or Suppliers. Review and approval of a component item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval of Shop Drawings, product data, or Samples will not relieve Contractor of responsibility for any deviation from requirements of the Contract Documents unless Contractor has in writing called Engineer's attention to such deviation at the time of submission, and Engineer has given written concurrence in and approval of the specific deviation. Approval by Engineer shall not relieve Contractor from responsibility for errors or omissions in Submittals.

E. Submittal Action Stamp:
1. Engineer's review action stamp, appropriately completed, will appear on all Submittals of Contractor when returned by Engineer. Review status designations listed on Engineer's action stamp are defined as follows:

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

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

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

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

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

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

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

1.04 INFORMATIONAL SUBMITTALS:

A. Informational Submittals are comprised of technical reports, administrative Submittals, and guarantees which relate to the Work, but do not require Engineer approval prior to proceeding with the Work. Informational Submittals include:
   1. Field test reports.
   2. Certification on Materials:
      a. Steel mill tests.

3. Soil test reports.
4. Job progress schedules.
5. Equipment and Material delivery schedules.
6. Progress photographs.
7. Warranties and guarantees.

B. Transmittal of Informational Submittals:
   1. All informational Submittals furnished by Subcontractors, manufacturers, and Suppliers shall be submitted to Engineer by Contractor unless otherwise specified.
      a. Identify each informational Submittal by Project name and number, Contract title and number, and Specification Section and Article number marked thereon or in letter of transmittal. Unidentifiable Submittals will be returned for proper identification.
      b. At the time of each submission, call to the attention of Engineer in the letter of transmittal any deviations from requirements of the Contract Documents.
   2. Quantity Requirements:
      a. Technical reports and administrative Submittals except as otherwise specified:
         (1) Electronic: One to Engineer.
   3. Test Reports:
      a. Responsibilities of Contractor, Owner, and Engineer regarding tests and inspections of Equipment and Materials and completed Work are set forth elsewhere in these Contract Documents.
      b. The party specified responsible for testing or inspection shall in each case, unless otherwise specified, arrange for the testing laboratory or reporting agency to distribute test reports as follows:
         (1) Owner: One copy.
         (2) Engineer: One copy.
         (3) Contractor: One copy.

C. Engineer's Review:
   1. Engineer will review informational Submittals for indications of Work or Material deficiencies.
   2. Engineer will respond to Contractor on those informational Submittals which indicate Work or Material deficiency.

PART 2 - PRODUCTS - Not Applicable.

PART 3 - EXECUTION – Not Applicable.

END OF SECTION 013300

Package Description	Subj. To LDs *	With Proposal	For Approval (required prior to fabrication)	For Information/ Certification/Construc
Certificate of Insurance	No			P (1) - 14 days after NTP
Acknowledge Acceptance and Return of Contract.	No			P (3) - 7 days after Receipt Contract
Letter of Credit or Performance Bond if required	No			P (1) - 10 business days aft
Notice of any Cancellation, Termination, or Material Changes of Insurance Policies	No			30 days before cancellation change
Detailed Work Progress Schedule	No		E - 10 days after NTP, monthly thereafter	
Manufacturer Field Staffing Plan, including Names and Durations of Visits	No			E - 10 days before arrival t
Progress Reports	No			E - 10 days after NTP, mon through engineering and fabrication, and with each i for partial payment.
Partial Lien Waiver	No			With Invoice
Quality Assurance / Quality Control Manuals, unless on file with Purchaser's QA/QC Department	No	E		
Copies of Certified Test and Inspection Reports	No			E - 15 days after test
Transportation / Shipping Plan	No			E - 10 days before first shi
Notice of Shipment	No			E - two weeks prior to shi
Erection / Installation / Assembly Instructions	No			E - 10 days prior to contrac delivery date
Material Safety Data Sheets (if applicable)	No			E - 10 day prior to shipmen
Design Data / Design Calculations	No			E - Prior to Final Payment
Final Bill of Materials	No			E - Prior to Final Payment
Final Lien Waiver	No			With Final Invoice
Final As-Manufactured Submittals	Yes			E - Prior to Delivery
All Remaining Submittals Not Listed, but Specified in Divisions 1 through 48	No		As required to meet schedule.	E - 30 days after NTP
PILING				
Piling Subcontractor Experience Qualifications	No	E		
Dynamic Testing Consultant Experience Qualifications	No	E		
Details of proposed H-piles and pile points.	Yes		E - 1 week after NTP	
Details of proposed pile-driving equipment (make and model of hammer).	Yes		E - 1 week after NTP	
Weight, stiffness, and coefficient of restitution of capblock assembly, cushion dimensions, type of cushion material, and cushion stiffness.	Yes		E - 1 week after NTP	
Location and types of splices, if present.	Yes		E - 1 week after NTP	
Pile Driving Layout and Sequence Plan.	Yes		E - 1 week after NTP	
Details of proposed dynamic load testing operations.	Yes		E - 1 week after NTP	
Construction Records (pile installation logs).	Yes			E - Within 2 days of install
Construction Records (PDA/CAPWAP data).	Yes			E - Within 2 days of testing
All Remaining Submittals Specified in Division 31.	No			

Appendix 013300-B

Submittal Description – As applicable to the Scope of Work of this Contract

Piling Information

- Piling Subcontractor Experience Qualifications
- Dynamic Testing Consultant Experience Qualifications
- Details of proposed H-Piles and pile points.
- Details of proposed Pile Driving Equipment.
- Locations and types of splices, if present.
- Pile Driving Layout and Sequence Plan.
- Details of proposed Dynamic Load Testing Operations.
- Construction Records (pile installation logs).
- Construction Records (PDA/CAPWAP data).

APPENDIX 013300-D – DOCUMENT MANAGEMENT SYSTEM AND MANAGEMENT

Vendor Submittal Reference Document

Overview:

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

It is a step by step guide on:

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

Vendor Submittal Reference Document

Logging In:

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

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

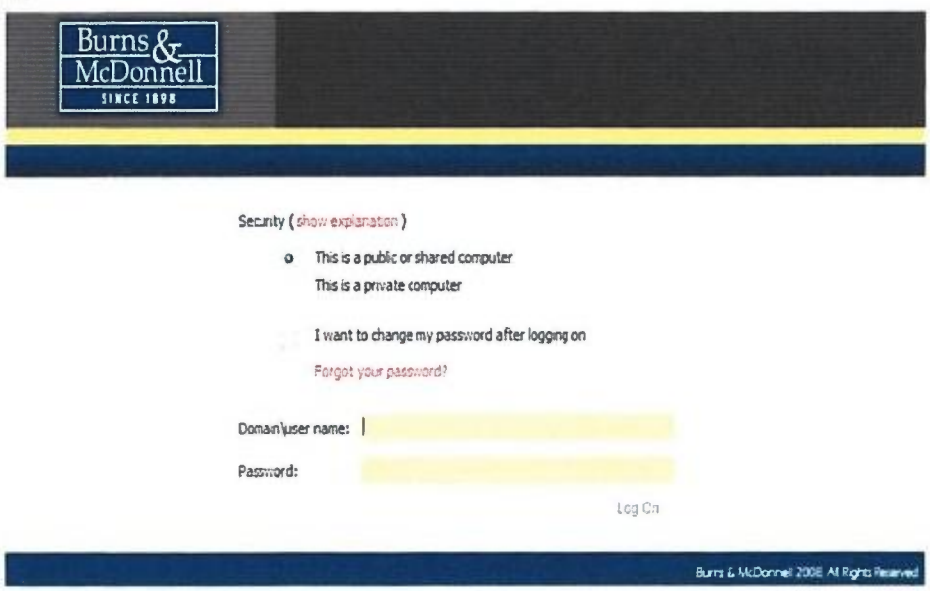
Previously you were not able to change the password you received, but now it can be reset after using the initial password from BMcD. After changing the password it cannot be changed again for 24 hours. Previously used passwords cannot be used again. The Domain is BMCDEXT and should preface your username.

To Login:

The Domain is BMCDEXT and should be typed in before the user name. **NOTE: Make sure you select This is a private computer-this will remember your login information so you will not have to type in your username and password again. Example: BMcDext\[user ID] so the information would be BMcDEXT\ext_jdoe.**

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

Login Screen:

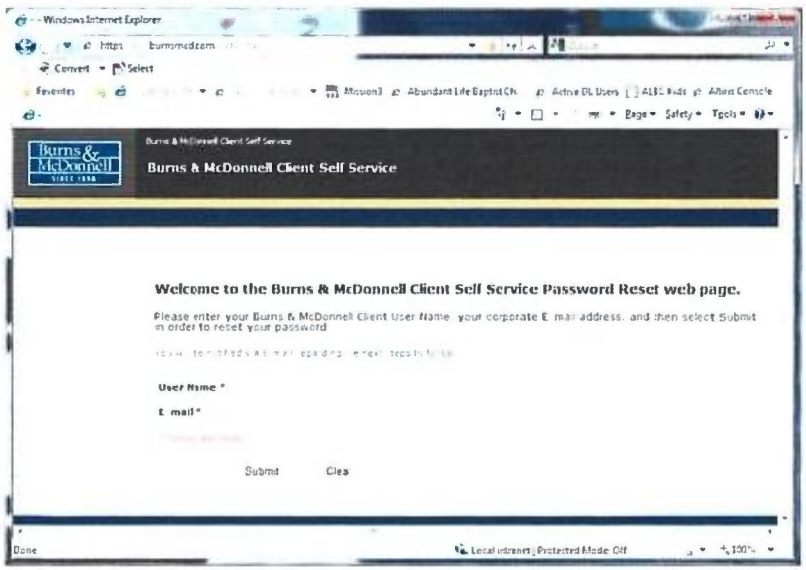


Set New Password screen:

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

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

Request New Password screen:



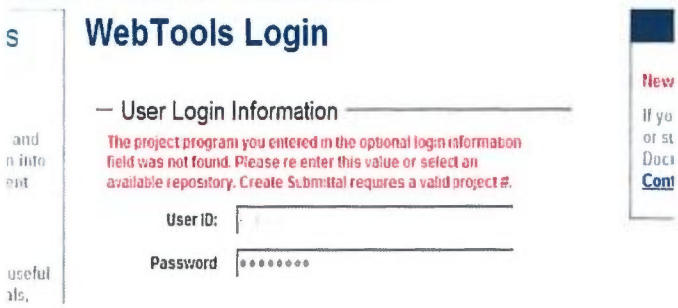
Creating a Submittal:

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

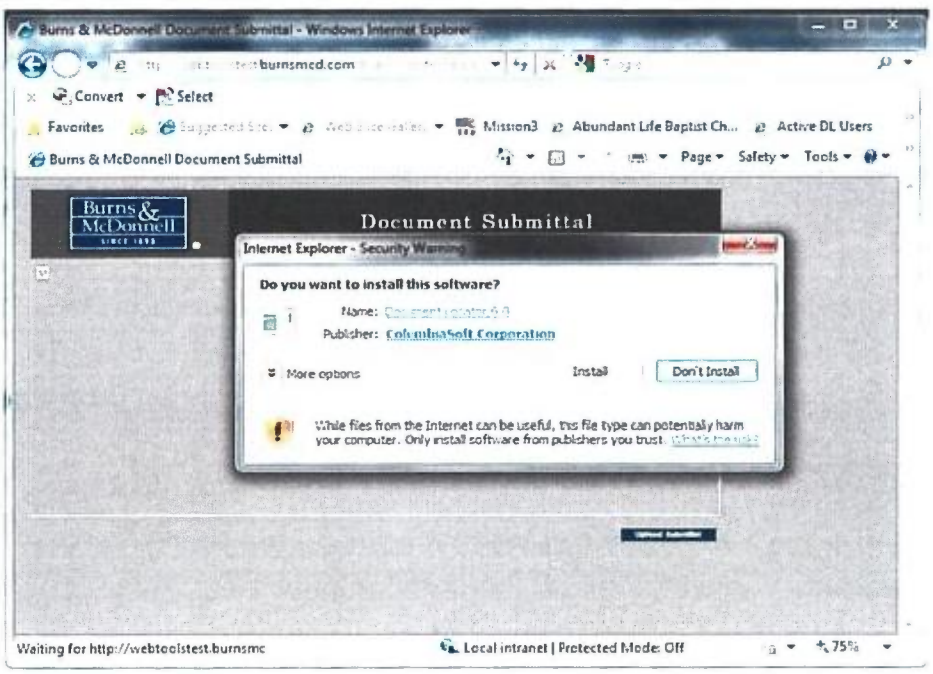
Your username and password information will be automatically populated into the BMcD Login screen.

1. To create a submittal click in the Project/Program text box and fill in with the appropriate project name or program number, then click Create Submittal.
   If a reminder of the appropriate project number is needed, log in to WebTools and view the available project number folders. By clicking on the "Documents" folder the list of available project number will be seen. Descriptions of those projects will be given on the right hand window pane. After the proper project number is verified, log back out to return to the Create Submittal option.
   Note: When creating a Submittal, the Repository information is not needed.

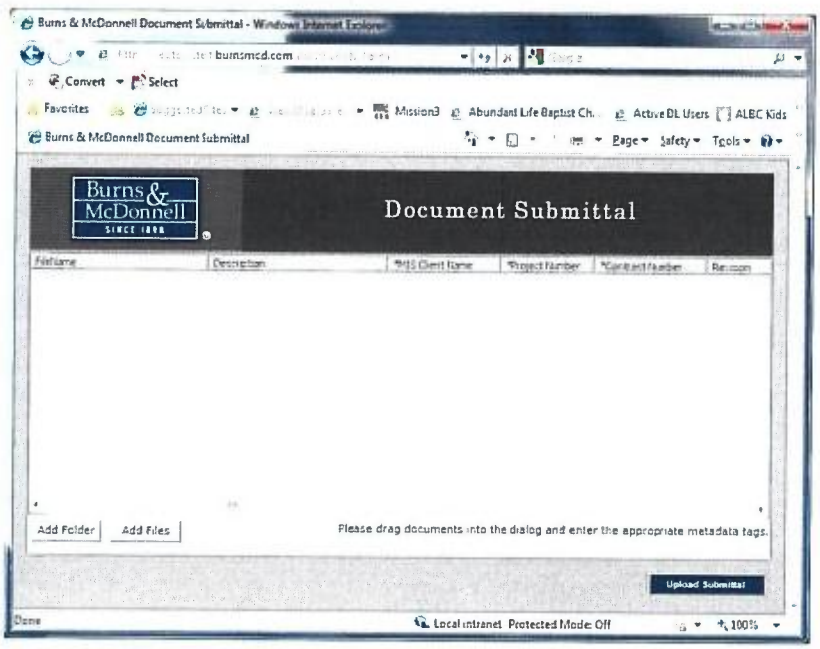
If the number is incorrectly entered the following error message will be displayed.
Check the number, if you believe you received this message in error you will need to contact your BMCD Document Control contact.



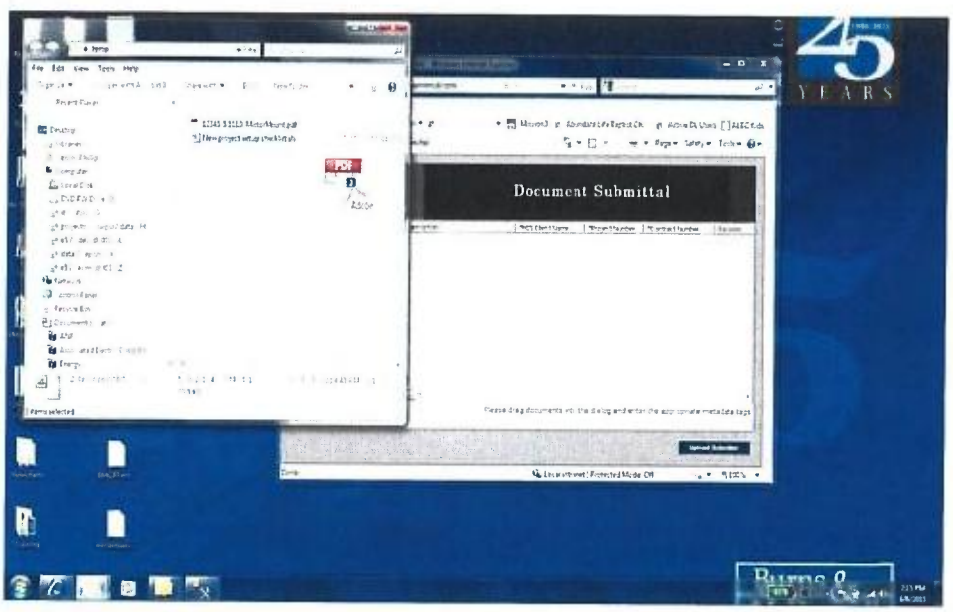
- If this is the first time you are visiting the Submittal screen then you will be prompted to load the ActiveX Add-On that will allow you to drag and drop documents into the screen. Click on Install to load the ActiveX Add-On.
  Note: Some companies prohibit the install of an ActiveX Add-On. If this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



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



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



Vendor Submittal Reference Document

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

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

Note: For document types and filenames see section 1.02 E of the 013300, 013301, 013304 or 013305 General Requirements specification.

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

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

  Do not include the following in the filenames:

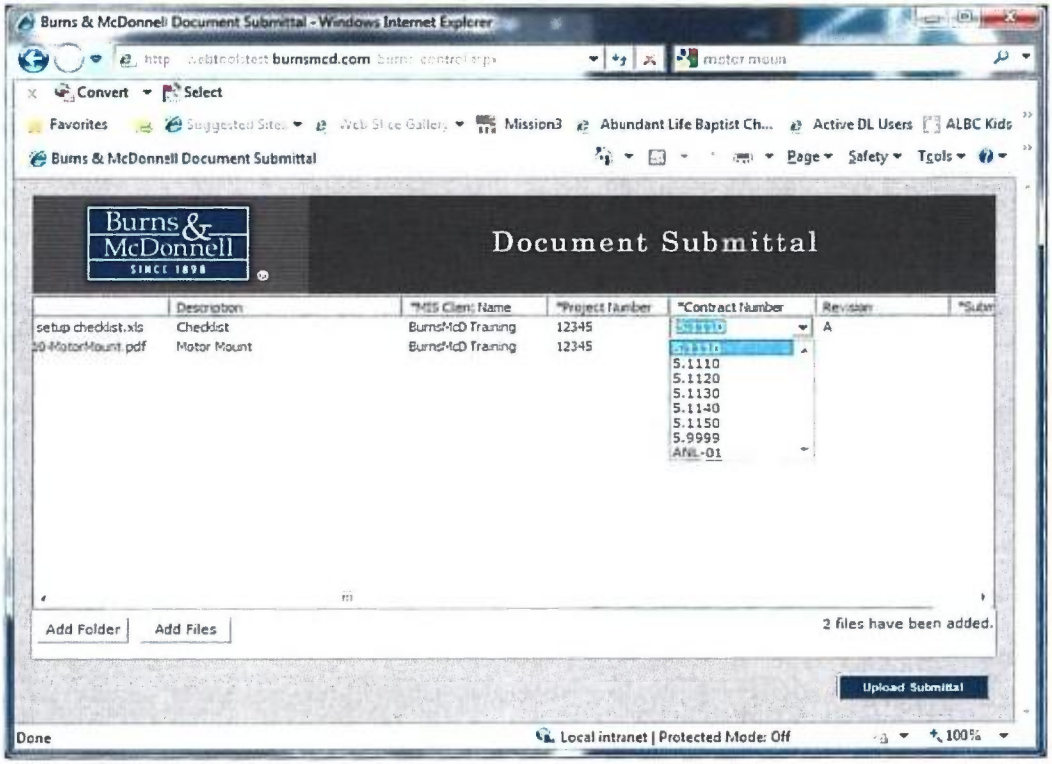
  a. Revision
  b. Dates
  c. File Description or Document Title
  d. Transmittal Information

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

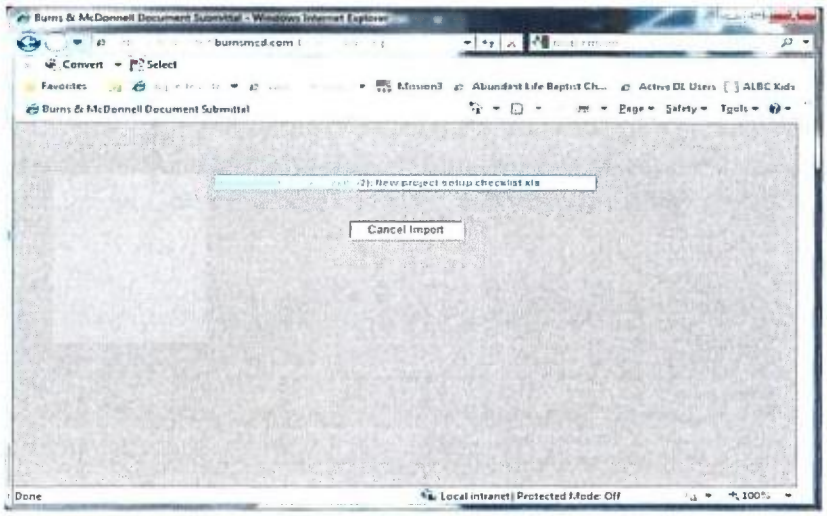
Valid filename examples: A07-9877-8-1.pdf, M-114-1-par.pdf, A-347-wps.pdf, 18555-18 ASME calcs.pdf, Terminal Point List.pdf

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

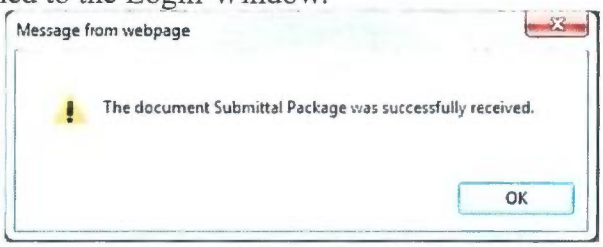
Vendor Submittal Reference Document



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



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



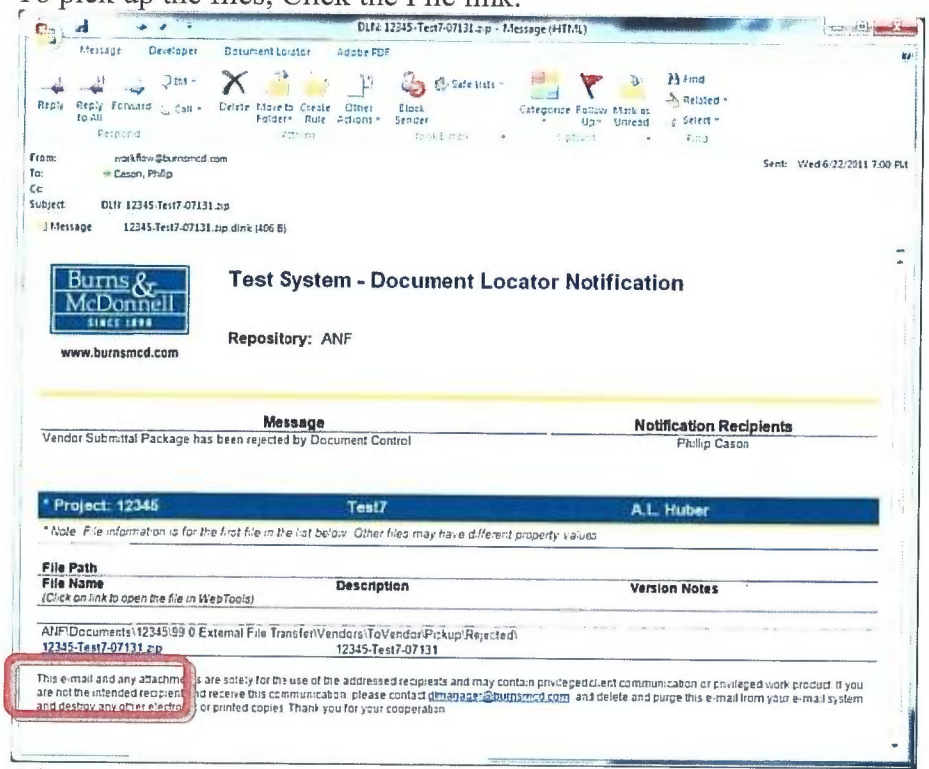
Notification of Receipt:

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

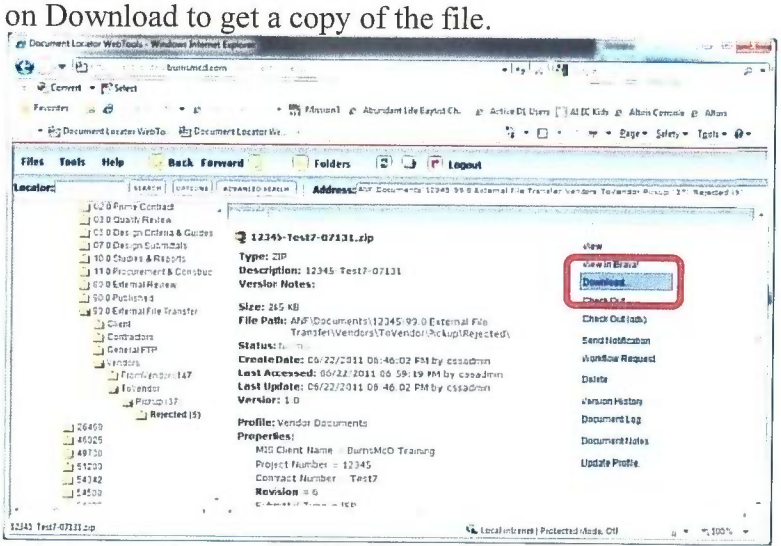
Picking up a Reviewed Submittal

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

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



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



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

SECTION 015100 - TEMPORARY UTILITIES AND FACILITIES

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes requirements of a temporary nature not normally incorporated into final Work. It includes the following:
   1. Utility services.
   2. Construction and support facilities.
   3. Construction aids.
   4. Safety and health.
   5. Fire protection.

B. Related Work Specified Elsewhere:
   1. Temporary Barriers and Controls: SECTION 015700.
   2. Field Offices and Sheds: SECTION 015200.

1.02 REFERENCES:

A. American National Standards Association (ANSI):
   1. A10 Series - Safety Requirements for Construction and Demolition.

B. National Electrical Contractors Association (NECA):
   1. Electrical Design Library - Temporary Electrical Facilities.

C. National Fire Protection Association (NFPA):
   1. 10 - Portable Fire Extinguishers.
   2. 70 - National Electrical Code.
   3. 241 - Safeguarding Construction, Alterations, and Demolition Operations.

D. National Electrical Manufacturers Association (NEMA).

E. Underwriters Laboratories (UL).

1.03 SUBMITTALS:

A. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 7 days of the date established for commencement of the Work.

1.04 QUALITY ASSURANCE:

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
   1. Building Code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, Fire Department, and rescue squad rules.
   5. Environmental protection regulations.
   6. Local codes and regulations.

B. Standards:
   1. Comply with NFPA 10 and 241, and ANSI A10 Series standards "Temporary Electrical Facilities."
   2. Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.

C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS:

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, unsanitary conditions, or public nuisances to develop or persist on the Site.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT:

A. Provide new materials and equipment. If acceptable to Engineer, undamaged previously used materials and equipment in serviceable condition may be used. Provide materials and equipment suitable for the use intended, of capacity for required usage, and meeting applicable codes and standards. Comply with requirements of DIVISIONS 7 through 31.

B. Water: Provide a tie-in to the plant potable water system indicated on the Green Station Outage Lay Down Map, if required.

C. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30 m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

D. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.

E. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

F. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

G. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

H. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.01 TEMPORARY UTILITIES:

A. General:

1. If necessary, engage the appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

2. Provide adequate utility capacity at each stage of construction. Prior to availability of temporary utilities at the Site, provide trucked-in services as required for start-up of construction operations.
3. Obtain and pay for temporary easements required to bring temporary utilities to the Project Site, where Owner's permanent easement cannot be used for that purpose.
4. Furnish, install, and maintain temporary utilities required for adequate construction, safety, and security. Modify, relocate, and extend systems as Work progresses. Repair damage caused by installation or use of temporary facilities. Grade the areas of Site affected by temporary installations to required elevations and grades, and clean the area. Remove on completion of Work or until service or facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
5. The types of temporary construction utilities and facilities required include, but not by way of limitation, water distribution, drainage, dewatering equipment, enclosure of Work, heat, ventilation, electrical power distribution, lighting, hoisting facilities, stairs, ladders, and roads.
6. Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities, and obtain required certifications and permits for use.
7. Materials used for temporary service shall not be used in the permanent system unless so specified or acceptable to Engineer.

B. Because of operational requirements, Owner may restrict or curtail Contractor's use of electric power, water, and compressed air. If these utilities are critical to Contractor's operations and completion of the Contract on the agreed schedule, Contractor shall consider furnishing alternate sources for its own use. Restriction or curtailment of these utilities shall not be a basis for a claim against Owner or an extension of the agreed schedule.

3.02 TEMPORARY ELECTRICITY AND LIGHTING:

A. Use of Existing System:
1. Owner's existing system may be used for temporary electricity.
2. Owner personnel will provide connections to existing facilities, sized to provide service required for power and lighting.
3. Modify, supplement, and extend service as necessary to meet needed requirements and prevent overloading of existing system.
4. Protect system to prevent interference with Owner's normal usage.

B. Use of Permanent System:
1. Prior to use of permanent system for construction purposes, obtain written permission of Owner.
2. Maintain permanent system as specified for temporary facilities.

C. Costs of Installation and Operation:
1. Pay fees and charges for permits and applications.
2. Pay costs of installation, maintenance, removal of temporary services, and restoration of any permanent facilities used.
3. Cost of power used will be paid by Owner.
4. Obtain and pay costs for temporary easements required across properties other than that of Owner.

3.03 TEMPORARY HEAT AND VENTILATION:

A. General:
   1. Provide temporary heat, ventilation, and cooling as required to maintain adequate environmental conditions to facilitate progress of the Work, to meet specified minimum conditions for the installation of materials, and to protect materials and finishes from damage. Protect from adverse affects of low temperatures or high humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.
   2. Methods of heating and fuel shall be suitable for particular purposes. Portable heaters shall be standard approved units with controls.

B. Use of Existing Systems:
   1. Existing systems shall not be used for temporary heating, cooling, or ventilating.

C. Use of Permanent System:
   1. Prior to use of permanent system, obtain written permission of Owner, which will define:
      a. Conditions of use.
      b. Provisions relating to guarantees on equipment.
   2. Prior to operation, verify that inspection has been made by proper authorities and installation has been approved for operation.
   3. Install temporary filters for air-handling units and for permanent ducts. Install new filters upon Substantial Completion.
   4. Provide operation and maintenance of systems.
   5. Place operational zones of permanent HVAC system in use sequentially as respective areas of Project become adequately enclosed for efficient operation.

D. Costs of Installation and Operation:
   1. Pay fees and charges for applications, permits, and inspections.
   2. Pay costs of installation, operation, maintenance, removal of equipment, and restoration of existing or permanent facilities if used.
   3. Pay cost of power and fuel used.

3.04 TEMPORARY WATER:

A. Use of Existing System:
   1. Owner's existing system may be used for temporary water.
   2. Make connections to existing facilities to provide water for construction purposes.
      a. Water Source: Make connections to Owner's service located at point indicated on the Green Station Outage Lay Down Map.
   3. Modify, supplement, and extend system as necessary to meet temporary water requirements and prevent overloading of existing system.
   4. Regulate system to prevent interference with Owner's usage.

B. Use of Permanent System:
   1. Prior to use of permanent system for construction purposes, obtain written permission of Owner.
   2. Prior to Use of System for Drinking Water:
      a. Permanent system is not to be used for drinking water. Contractor is responsible for the supply of drinking water.

C. Costs of Installation and Operation:
   1. Pay all costs for installation, maintenance, and removal.
   2. Cost of water used will be paid by Owner.

3.05 TEMPORARY TELEPHONE SERVICE:

A. General:
   1. Arrange with local telephone service company and provide direct line telephone service at the construction Site for the use of construction personnel and employees.
   2. Arrange with local cellular/mobile telephone service company and provide mobile telephone service for use by Contractor and so Contractor can be reached at construction Site during normal working hours.

B. Costs of Installation and Operation:
   1. Pay all costs for installation, maintenance and removal, and service charges for local calls. Toll charges shall be paid by the party who places the call.

3.06 TEMPORARY SANITARY FACILITIES:

A. Contractor-Furnished Facilities:
   1. Furnish, install, and maintain temporary sanitary facilities for use through construction period. Remove on completion of Work.
   2. Provide for all construction workers under this Contract and representatives at the Site.
   3. Toilet facilities shall be of the chemical, aerated recirculation, or combustion type, properly vented, and fully enclosed with a glass- fiber-reinforced polyester shell or similar nonabsorbent material.
   4. Water and sewer connected facilities may be installed to extent permitted by governing regulations.
      a. Provide lavatories, mirrors, urinals (where applicable), and water closets in water and sewer connected units. Provide only potable water at lavatories. Provide individual compartments for water closets where the unit is intended for occupancy by more than one person. Provide suitable enclosure with nonabsorbent sanitary finish materials and adequate heat, ventilation, and lighting.
      b. Provide separate toilet facilities for male and female construction personnel as required.
   5. Wash Facilities: Install potable water-supplied wash facilities at locations convenient to construction personnel involved in the handling of compounds and materials where wash-up is necessary to maintain a safe, healthy and sanitary condition. Where recommended or required by governing authorities and regulations or recognized standards provide emergency safety showers, emergency eye-wash fountains, showers, and similar facilities. Dispose of drainage properly. Supply soap and other cleaning compounds appropriate for each condition.
   6. Drinking Water Fixtures: Provide containerized tap-dispenser type drinking water units. Provide drinking water fountains if piped potable water is reasonably accessible from permanent or temporary lines.
   7. Supply and maintain toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each facility. Provide appropriate covered waste containers for used material.

B. Use of Existing Facilities:
   1. Existing restrooms facilities shall not be used.

C. Use of Permanent Facilities:
   1. Permanent sanitary facilities shall not be used by construction personnel.

3.07 SEWERS AND DRAINAGE:

A. General: Where sewers or drainage facilities are not available for discharge of effluent, provide containers to remove and dispose of effluent off the Site in a lawful manner. If existing sewers are available for temporary drainage near the Site prior to completion of permanent sewers, provide temporary connections to remove effluent that can be lawfully discharged into the sewers. If existing sewers cannot be used for discharge, provide drainage ditches, dry wells, waste stabilization ponds, and similar discharge facilities to remove effluent that can be lawfully discharged in that manner.

B. Connect temporary sewers to the municipal sewer systems in the manner directed by the sewer department officials.

C. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy usage, restore to normal conditions promptly. Provide and maintain temporary earthen embankments and similar barriers in and around construction excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rain storms.

3.08 TEMPORARY CONSTRUCTION AIDS:

A. General:
   1. Provide construction aids and equipment required by personnel and to facilitate the execution of the Work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other such facilities and equipment.
   2. Materials may be new or used, must be suitable for the intended purpose, and meet the requirements of applicable codes, regulations, and standards.
   3. When permanent stair framing is in place, provide temporary treads, platforms, and railings for use by construction personnel.

B. Use of Existing Stairs, Elevators, Hoists, and Similar Facilities:
   1. Stairs in existing building shall not be used by construction personnel.
   2. Elevators in the existing building shall not be used by construction personnel.
   3. Maintain all existing facilities and equipment in a condition equivalent to or better than condition at beginning of usage.

3.09 TEMPORARY ENCLOSURES:

A. New Construction:
   1. Provide temporary enclosure of exterior walls as Work progresses, to provide acceptable working conditions, weather protection for interior materials, allow for effective temporary heating, and to prevent entry of unauthorized persons.
      a. Provide temporary exterior doors with hardware, including being lockable.
      b. Other enclosures shall be removable as necessary for Work and for handling of materials.
   2. Restore permanent facilities used for temporary purposes to specified condition.

B. Existing Construction:
   1. Provide temporary enclosures to separate Work areas from the areas of existing building occupied by Owner to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, and to protect Owner's employees and operations from construction Work.
      a. Temporary Partition and Ceiling Enclosures: Framing and sheet materials which comply with structural and fire rating requirements of applicable codes and standards.

b. Close joints between sheet materials and seal edges and intersections with existing surfaces. Prevent penetration of dust or moisture.
c. In locations where fire protection is required, provide the fire protection as required by local fire regulations.

2. Restore existing facilities used for temporary purposes to original or better condition.

3.10 TEMPORARY SAFETY AND HEALTH:

A. General: Contractor shall be solely responsible for initiating, maintaining, and supervising all safety and health precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide necessary protections to prevent injury or loss to, all employees on the Work and other persons and organizations who may be affected thereby.

3.11 TEMPORARY FIRE PROTECTION:

A. General:
1. Contractor shall be responsible for development of a fire prevention and protection program for all Work under this Contract.
2. The program shall comply with the applicable provisions for safety and protection specified in the Contract Documents and with applicable parts of the NFPA 10 and 241.
3. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near such usable stairwell.
4. Store combustible materials in containers in fire-safe locations.
5. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
6. Provide supervision of welding operations and similar sources of fire ignition.
7. Post warning and instructions at each extinguisher location, and instruct construction personnel on proper use of extinguishers and other available facilities at Project Site. Post local fire department telephone number on or near each telephone instrument at Project Site.

B. Permanent Fire Protection:
1. Complete each fire protection facility at earliest reasonable date, place into operation, and make ready for emergency use.
2. Instruct personnel at Site on availability and proper use.

3.12 INSTALLATION AND REMOVAL:

A. Relocation: Relocate construction aids as required by progress of construction, storage limitations, or Work requirements and to accommodate requirements of Owner and other contractors at the Site.

B. Removal: Remove temporary materials, equipment, and services when construction needs can be met and allowed by use of permanent construction, or at completion of the Project.

C. Repair: Clean and repair damage caused by installation or by use of temporary facilities.
1. Remove foundations and underground installations for construction aids.
2. Grade the areas of the Site affected by temporary installations to required elevations and clean the area.

END OF SECTION 015100

SECTION 015200 - FIELD OFFICES AND SHEDS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes requirements for temporary field offices and other structures required for office and storage space required by Contractor.

B. Related Work Specified Elsewhere:

1. Equipment and Materials: SECTION 016000.
2. Temporary Utilities and Facilities: SECTION 015100.

C. Use of Existing Facilities:

1. Existing facilities at the Site shall not be used for field offices.

D. Use of Permanent Facilities:

1. Permanent facilities when substantially completed shall not be used for field offices or for storage.

PART 2 - PRODUCTS

2.01 FIELD OFFICES:

A. General:

1. Provide trailers, mobile buildings, or buildings constructed with floors raised aboveground, with steps, landings, and railings at entrance doors.
2. Buildings shall be structurally sound, secure, and weathertight.
3. Provide appropriate type fire extinguishers at each office and storage area.
4. Maintain offices during progress of the Work.
5. Install office spaces ready for occupancy 15 Days after date stated in Notice to Proceed, if required by Contractor.

B. Contractor's Office:

1. Provide a field office for Contractor's superintendent on the Site, if required by Contractor.
2. It shall be of size required for general use, with lights, heat, furnishings, telephone service, and other necessary facilities and utilities required by Contractor's operations.

2.02 STORAGE SHEDS AND TRAILERS:

A. On Site:

1. Provide temporary buildings or trailers needed for storage of Equipment and Materials installed under this Contract.
2. Provide ventilation and heating as required by Equipment and Material stored.

B. Off Site:

1. Advise Engineer of any arrangements made for storage of Equipment and Materials in a place other than Owner's Site. Furnish evidence of insurance coverage with Application for Payment as required by Owner.

PART 3 - EXECUTION

3.01 LOCATION, INSTALLATION AND MAINTENANCE:

A. General:

1. Place temporary buildings, trailers, and stored materials in locations acceptable to Owner or Engineer.

2. Install field offices and sheds to resist winds and elements of the locality where installed.
3. Remove when no longer needed at the Site or when Work is completed.
4. Keep approach walks free of leaves, mud, water, ice, or snow.
5. At completion of Work, remove temporary buildings and trailers, foundations (if any), utility services, and debris.
6. Prepare ground or paved areas as specified in applicable Sections.

END OF SECTION 015200

SECTION 015700 - TEMPORARY BARRIERS AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes General Requirements for:
   1. Safety and protection of Work.
   2. Safety and protection of existing property.
   3. Barriers.
   4. Security.
   5. Environmental controls.
   6. Access roads and parking areas.
   7. Traffic control and use of roadways.

B. Related Work Specified Elsewhere:
   1. Temporary Utilities and Facilities: SECTION 015100.

PART 2 - PRODUCTS – Not Applicable.

PART 3 - EXECUTION

3.01 SAFETY AND PROTECTION OF WORK AND PROPERTY:

A. General:
   1. Provide for the safety and protection of the Work and of Materials and Equipment to be incorporated therein, whether in storage on or off the Site. Provide protection at all times against rain, wind, storms, frost, freezing, condensation, or heat so as to maintain all Work and Equipment and Materials free from injury or damage. At the end of each day, all new Work likely to be damaged shall be appropriately protected.
   2. Notify Engineer immediately at any time operations are stopped due to conditions which make it impossible to continue operations safely or to obtain proper results.
   3. Construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations, floors, pits, trenches, manholes, and ducts free of water.
   4. Protect floors from damage by proper covering and care when handling heavy equipment, painting, or handling mortar or other such materials. Use proper cribbing and shoring to prevent overloading of floors while moving heavy equipment. Provide metal pans under pipe-threading machines and clean such pans daily, keeping oil off floors. Restore floors to former condition where damaged or stained.
   5. Concrete floors less than 28 days old shall not be loaded without written permission from Engineer.
   6. Restrict access to roofs except as required by the Work. Where access is required, provide protection with plywood, boards, or other suitable materials.

B. Property Other than Owner's:
   1. Provide for the safety and protection of property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction. Report immediately to the owners thereof and promptly repair damage to existing facilities resulting from construction operations.
   2. Operation of valves or other appurtenances on existing utilities, when required, shall be by or under the direct supervision of the owning utility.

3. Where fences are to be breached on private property, the owners thereof shall be contacted and arrangements made to ensure proper protection of any livestock or other property thus exposed.
4. The applicable requirements specified for protection of the Work shall also apply to the protection of existing property of others.
5. Before acceptance of the Work by Owner, restore all property affected by Contractor's operations to the original or better condition.

3.02 BARRIERS:

A. General:
1. Furnish, install, and maintain suitable barriers as required to prevent public entry, to protect the public, and to protect the Work, existing facilities, trees, and plants from construction operations. Remove when no longer needed or at completion of Work.
2. Materials may be new or used, suitable for the intended purpose, but shall not violate requirements of applicable codes and standards or regulatory agencies.
3. Barriers shall be of a neat and reasonable uniform appearance, structurally adequate for the required purposes.
4. Maintain barriers in good repair and clean condition for adequate visibility. Relocate barriers as required by progress of Work.
5. Repair damage caused by installation and restore area to original or better condition. Clean the area.

3.03 ENVIRONMENTAL CONTROLS:

A. Dust Control:
1. Provide positive methods and apply dust control materials to minimize raising dust from construction operations; and to prevent airborne dust from dispersing into the atmosphere.
2. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly-coated surfaces.

B. Water and Erosion Control:
1. Provide methods to control surface water to prevent damage to the Project, the Site, or adjoining properties.
2. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   a. Hold the areas of bare soil exposed at one time to a minimum.
   b. Provide temporary control measures such as berms, dikes, and drains.
3. Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels, and other construction areas; and to direct drainage to proper runoff.
4. Provide, operate, and maintain hydraulic equipment of adequate capacity to control surface and groundwater.
5. Treat and dispose of surface runoff water in a manner to prevent flooding, erosion, sedimentation, or other damage to any portion of the Site or to adjoining areas, and in a manner acceptable to authorities having jurisdiction.
6. Provide temporary drainage where the roofing or similar waterproof deck construction is completed prior to the connection and operation of the permanent drainage piping system.

C. Rodent Control:

1. Provide rodent control as necessary to prevent infestation of construction or storage areas.
    a. Employ methods and use materials which will not adversely affect conditions at the Site or adjoining properties.
    b. Should the use of rodenticides be considered necessary, submit an informational copy of the proposed program to Owner with a copy to Engineer. Clearly indicate:
        (1) The area or areas to be treated.
        (2) The rodenticides to be used, with a copy of the manufacturer's printed instructions.
        (3) The pollution preventive measures to be employed.
2. The use of any rodenticide shall be in accordance with the manufacturer's printed instructions and regulatory agencies.

D. Debris Control and Clean-Up:
1. Keep the premises free at all times from accumulations of debris, waste materials, and rubbish caused by construction operations and employees. Responsibilities shall include:
    a. Adequate trash receptacles about the Site, emptied promptly when filled.
    b. Periodic cleanup to avoid hazards or interference with operations at the Site and to maintain the Site in a reasonably neat condition.
    c. The keeping of construction materials such as forms and scaffolding neatly stacked.
    d. Immediate cleanup to protect the Work by removing splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from walls, floors, and metal surfaces before surfaces are marred.
2. Prohibit overloading of trucks to prevent spillages on access and haul routes. Provide periodic inspection of traffic areas to enforce requirements.
3. Final cleanup is specified in SECTION 017800 - CONTRACT CLOSEOUT.

E. Pollution Control:
1. Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of hazardous or toxic substances from construction operations.
2. Provide equipment and personnel, perform emergency measures required to contain any spillages, and remove contaminated soils or liquids. Excavate and dispose of any contaminated earth off-Site in approved locations, and replace with suitable compacted fill and topsoil.
3. Take special measures to prevent harmful substances from entering public waters, sanitary, or storm sewers.

3.04 ACCESS ROADS AND PARKING AREAS:

A. Existing On-Site Roads and Parking Areas:
1. Designated existing on-Site streets and parking facilities may be used for construction traffic. These areas are located on the Green Station Outage Lay Down Map.
    a. Provide temporary additional roads as needed for required construction access.
    b. Maintain existing construction, and restore to original, better, or specified condition at completion of Work.
    c. Do not allow heavy vehicles or construction equipment in parking areas.

3.05 TRAFFIC CONTROL AND USE OF ROADWAYS:

A. Traffic Control:

1. Provide, operate, and maintain equipment, services, and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow on haul routes, at Site entrances, on-Site access roads, and parking areas. This includes traffic signals and signs, flagmen, flares, lights, barricades, and other devices or personnel as necessary to adequately protect the public.
2. Remove temporary equipment and facilities when no longer required. Restore grounds to original, better, or specified condition when no longer required.
3. Provide and maintain suitable detours or other temporary expedients if necessary.
4. Bridge over open trenches where necessary to maintain traffic.
5. Consult with governing authorities to establish public thoroughfares which will be used as haul routes and Site access. All operations shall meet the approval of owners or agencies having jurisdiction.

B. Maintenance of Roadways:
   1. Repair roads, walkways, and other traffic areas damaged by operations. Keep traffic areas as free as possible of excavated materials and maintain in a manner to eliminate dust, mud, and hazardous conditions.
   2. All operations and repairs shall meet the approval of owners or agencies having jurisdiction.

END OF SECTION 015700

SECTION 016000 - EQUIPMENT AND MATERIALS

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements governing Contractor's selection of products for use in the Project.
   1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime contractor.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. For submittal of Contractor's construction progress schedule and the Submittal schedule: SECTIONS 013200 and 013300.

1.02 DEFINITIONS:

A. Definitions used in this Article are not intended to change the meaning of other terms used in these Contract Documents, such as "specialties," "systems," "structures," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
   1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "Material," "Equipment," "system," and terms of similar intent.
      a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
      b. "Foreign Products," as distinguished from "domestic products," are items substantially manufactured (50% or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50%) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.
   2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
   3. "Equipment" is a product with operational or nonoperational parts, whether motorized, or manually operated, that may require service connections, such as wiring or piping.

1.03 SUBMITTALS:

A. Submittal of preliminary procurement schedule is specified in SECTION 013200 - CONSTRUCTION PROGRESS SCHEDULES AND REPORTS.

B. Submittals for products are specified in SECTION 013300 and in applicable Sections of DIVISIONS 1 through 31.

1.04 QUALITY ASSURANCE:

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each prime contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate contractors.
2. If a dispute arises between prime contractors over concurrently selectable, but incompatible products, Engineer will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:
1. No available domestic product complies with the Contract Documents.
2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.

1.05 TRANSPORTATION AND SHIPMENT:

A. Shipment Preparation:
1. Contractor shall require manufacturers and Suppliers to prepare products for shipment in a manner to facilitate unloading and handling, and to protect against damage, deterioration, or unnecessary exposure to the elements in transit and storage. Provisions for protection shall include the following:
a. Crates or other suitable packaging materials.
b. Covers and other means to prevent corrosion, moisture damage, mechanical injury, and accumulation of dirt in motors, electrical equipment, and machinery.
c. Suitable rust-preventive compound on exposed machined surfaces and unpainted iron and steel.
d. Grease packing or oil lubrication in all bearings and similar items.

B. Marking: Each product item shall be tagged or marked as identified in the delivery schedule or on Submittals. Complete packing lists and bills of material shall be included with each shipment. Each piece of every item need not be marked separately, provided that all pieces of each item are packed or bundled together and the packages or bundles are properly tagged or marked.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING:

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
1. Schedule delivery to minimize long-term storage at the Site and to prevent overcrowding of construction spaces. Allow ample time to avoid delay of the Work.
2. Deliver products to the Site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
3. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected. Inspect shipment to assure:
a. Product complies with requirements of Contract Documents and reviewed Submittals.
b. Quantities are correct.
c. Containers and packages are intact and labels are legible.
d. Products are properly protected and undamaged.
4. Store products at the Site in a manner that will facilitate inspection and measurement of quantity or counting of units. Mark deliveries of component parts of Equipment to

identify the Equipment, to permit easy accumulation of parts, and to facilitate inspection and measurement of quantity or counting of units.

5. Store heavy Materials away from the Project structure in a manner that will not endanger the supporting construction.
6. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, and with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.
7. Protect exposed machined surfaces and unpainted iron and steel as necessary with suitable rust-preventive compounds.
8. Handle and store steel plate, sheet metal, and similar items in a manner to prevent deformation.

B. Handling:
1. Provide equipment and personnel necessary to unload and handle products, by methods to prevent damage or soiling to products, or packaging.
2. Handle by methods to prevent bending or overstressing. Where lifting points are designated, lift components only at those points.
3. Provide additional protection to surrounding surfaces as necessary to prevent damage.

C. Maintenance of Storage:
1. Inspect stored products on a scheduled basis.
2. Verify that storage facilities comply with manufacturer's product storage requirements, including environmental conditions continually maintained.
3. Verify that surfaces of products exposed to elements are not adversely affected; that any weathering of finishes is acceptable under requirements of Contract Documents.

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION:

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise specified or indicated, new at the time of installation.
1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
2. Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Conform to applicable Specifications, codes, standards, and regulatory agencies.
4. Comply with size, make, type, and quality specified, or as specifically approved in writing by Engineer.
5. Manufactured and Fabricated Products:
   a. Design, fabricate, and assemble in accordance with the best engineering and shop practices.
   b. Manufacture like parts of duplicate units to standard sizes and gages, to be interchangeable.
   c. Equipment and Materials shall be suitable for service conditions intended.
   d. Equipment capacities, sizes, and dimensions indicated or specified shall be adhered to unless variations are specifically approved in writing by Engineer.
6. Do not use products for any purpose other than that for which designed.
7. To the fullest extent possible, provide products of the same kind from a single source.

PART 3 - EXECUTION

3.01 INSTALLATION OF PRODUCTS:

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place except as required for proper movement and performance, and accurately located and aligned with other Work.

1. Obtain and distribute copies of manufacturer's printed instructions and recommendations if not a part of Submittals, containers, or packaging to parties involved in the installation, including a copy to Engineer and Owner.
2. Maintain one complete set of instructions at the Site during installation and until completion.
3. Handle, install, connect, clean, condition, and adjust products in accordance with such instructions and in conformance with specified requirements. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Engineer for further instructions.

B. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 016000

SECTION 017800 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Instruction book and operating manual submittal.
   4. Submittal of warranties.
   5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections of the Specifications.

C. Related Work Specified Elsewhere:
   1. Prerequisites to Substantial Completion and Final Acceptance: RUS FORMS.
   2. Submittals: SECTION 013300.

1.02 SUBSTANTIAL COMPLETION:

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100% completion for the portion of the Work claimed as Substantially Complete.
      a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Price.
      b. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete Work, and reasons the Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship Bonds, maintenance agreements, final certifications, and similar documents.
   4. Obtain and submit releases enabling Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   5. Submit record drawings, instruction books and operating manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
   6. Deliver tools, spare parts, extra stock, and similar items.
   7. Make final changeover of permanent locks and transmit keys to Owner. Advise Owner's personnel of changeover in security provisions.
   8. Complete start-up testing of systems and instruction of Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the Site, along with mockups, construction tools, and similar elements.
   9. Complete final cleanup requirements, including touchup painting.
   10. Touch up and otherwise repair and restore marred, exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled requirements. Engineer will prepare the Certificate of Substantial Completion following inspection or advise Contractor of construction that must be completed or corrected before the certificate will be issued.

1. Engineer will repeat inspection when requested and assured by Contractor that the Work is Substantially Complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.03 FINAL ACCEPTANCE:

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
   1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
   2. Submit an updated final statement, accounting for final additional changes to the Contract Price.
   3. Submit a certified copy of Engineer's final inspection list of items to be completed or corrected, endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by Engineer.
   4. Submit consent of surety to final payment.
   5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   6. Submit a final liquidated damages settlement statement.

B. Reinspection Procedure: Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to Engineer.
   1. Upon completion of reinspection, Engineer will prepare a certificate of final acceptance. If the Work is incomplete, Engineer will advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
   2. If necessary, reinspection will be repeated.

1.04 RECORD DOCUMENT SUBMITTALS:

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for Engineer's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Record information concurrently with construction progress.
   2. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work. Mark each document "PROJECT RECORD" in neat, large, printed letters.
   3. Mark new information that is important to Owner but was not shown on Contract Drawings or Shop Drawings.
   4. Note related Change Order numbers where applicable.
   5. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

6. Upon completion of the Work, submit record drawings to Engineer for Owner's records.
7. Include the following:
   a. Depths of various elements of foundation in relation to finish first floor datum.
   b. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   c. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of construction.
   d. Where Submittals are used for mark-up, record a cross-reference at corresponding location on Drawings.
   e. Field changes of dimension and detail.
   f. Changes made by Change Order or other Modifications.
   g. Details not on original Contract Drawings.

C. Record Specifications: Maintain one complete copy of the Project Manual including Addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and Modifications issued in printed form during construction.
1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
3. Note related record drawing information and product data.
4. Upon completion of the Work, submit record Specifications to Engineer for Owner's records.
5. Include the following:
   a. Manufacturer, trade name, catalog number, and Supplier of each product and item of Equipment actually installed, particularly optional and substitute items.
   b. Changes made by Addendum, Change Order, or other Modifications.
   c. Related Submittals.

D. Record Product Data: Maintain one copy of each product data Submittal. Note related Change Orders and markup of record drawings and specifications.
1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
3. Upon completion of markup, submit complete set of record product data to Engineer for Owner's records.

E. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and Submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records, and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to Engineer for Owner's records.

F. Electronic Documentation:
1. In addition to paper copies, provide electronic versions of record documents showing "as-constructed" conditions, "as-constructed" construction progress schedule, master field drawing list showing final revisions on CD-ROM in the latest release of AutoCAD.

G. Warranties and Bonds: Specified in RUS FORMS and elsewhere in the contract documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 FINAL CLEANING:

A. General: Contractor shall keep the Site premises free from accumulations of waste materials, rubbish, and other debris resulting from the Work. Regular Site cleaning is included in SECTION 015700.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
    a. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Clean concrete floors to a "broom clean" condition. Vacuum carpeted surfaces.
    b. Remove debris and surface dirt from limited-access spaces including roofs, plenums, shafts, trenches, equipment vaults, manholes, and similar spaces.
    c. Clean the Site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.
2. Remove temporary structures, tools, equipment, supplies, and surplus materials.
3. Remove temporary protection devices and facilities which were installed to protect previously completed Work.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the Site and dispose of lawfully.

1. Extra materials of value remaining after completion of associated Work become Owner's property. Dispose of these materials as directed by Owner.

E. Repairs:

1. Repair damaged protective coated surfaces.
2. Repair roads, walks, fences, and other items damaged or deteriorated because of construction operations.
3. Restore all ground areas affected by construction operations.

END OF SECTION 017800

SECTION 310817 – DYNAMIC PILE TESTING

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section specifies requirements for dynamic testing of driven foundation piling.

B. Dynamic testing requires attaching two strain transducers and two accelerometers to the pile usually 1.5 to 3 pile diameters below the pile head during initial driving or at a convenient location during restrike testing. A cable connects the sensors on the pile with the Pile Driving Analyzer® (available from Pile Dynamics, Inc., 30725 Aurora Road, Cleveland, OH 44139, USA; www.pile.com/pdi; email: sales@pile.com; phone: +1 216-831-6131; fax +1 216-831-0916) or equivalent, located at ground level a safe distance away from the pile.

C. Dynamic testing shall be performed on all indicator piles as indicated to assess the performance of the hammer, confirm the set, capacity and observed driving resistance with depth of the piles. Dynamic testing of indicator piles shall be performed at locations as designated by Engineer during the entire length of initial driving and during restrike driving.

D. The minimum duration between initial driving and restrike driving shall be as specified in the applicable Foundation Piling Section.

E. Dynamic testing shall be performed to verify that piling is being driven sufficiently to achieve their required design compression and design tension capacities with the specified safety factor value(s). The design compression capacity and design tension capacity values (and their respective minimum safety factor values) are summarized in the applicable Foundation Piling Section.

1.02 REFERENCES:

A. Applicable Standards:

1. American Society for Testing and Materials (ASTM):
   a. D4945 - Standard Test Method for High Strain Dynamic Testing of Piles.
2. Hannigan, P.J. et al, 2006. Workshop Manual on Design and Construction of Driven Pile Foundations, U.S. Department of Transportation, Federal Highway Administration, Report No. FHWA-HI-96-033, Washington, D.C., pp. 11-3 to 11-9.
3. American Association of State and Highway Transportation Officials (AASHTO):
   a. AASHTO LRFD Bridge Design Specifications, Fifth Edition, 2010.

1.03 SUBMITTALS:

A. Submit detailed information regarding make and model of pile hammer and driving equipment two weeks prior to commencement of indicator pile driving activities. Submit details of driving helmets, cap-blocks, pile cushions, follower, and driving heads. Include weight, dimensions, stiffness and coefficient of restitution of cap block assembly (helmet, hammer cushion materials, and driving head); dimensions, stiffness, coefficient of restitution and type of material(s) of cushion (pile cushion). Do not commence pile driving activities until complete pile hammer and driving equipment submittals have been received and accepted by Engineer.

B. Submit pile driving layout and sequence plan. Show the location, identification, order and orientation in which piles will be driven, and describe how the sequence will minimize piles from being displaced laterally when driving subsequent piles. Unless otherwise noted in the applicable Piling Section, it is intended that all indicator piles be installed at final production pile locations, uniformly distributed across the site, driven in a sequential manner to minimize their impact to production pile installation at the Site and so as to permit ease of access to subsequent production piles. The location of the indicator piles is subject to review and approval by the Engineer.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND PERSONNEL:

A. Dynamic monitoring shall be performed using a Pile Driving Analyzer. All equipment necessary for the dynamic monitoring such as sensors, cables, etc., shall be furnished by Dynamic Testing Consultant. The equipment shall conform to the requirements of ASTM D4945. An experienced engineer shall operate the Pile Driving Analyzer in the field.

B. Provide power capable of operating an electric drill to install sensor attachment holes in the test piles. Provide a 12 to 24 volt D.C. power source (e.g. car battery) for operating the Pile Driving Analyzer.

PART 3 - EXECUTION

3.01 CONSTRUCTION ACCESS:

A. Prior to lifting the pile to be dynamically tested, provide a minimum of 3 feet of clear access to 180 degree opposite faces of the pile for pile preparation. Dynamic Testing Consultant or Piling Subcontractor's personnel shall then drill and prepare holes in the pile for attachment of sensors.

B. Dynamic Testing Consultant or Piling Subcontractor's personnel will attach the sensors to the pile prior to initial driving. Driving shall then continue using routine pile installation procedures. When the sensors approach the ground surface, water surface, or a pile template, driving shall be halted to remove the sensors from the pile to prevent damage to the sensors. If additional driving is required, the pile shall be spliced and the sensors shall be reattached to the next pile segment prior to continuing driving.

3.02 TESTING PROCEDURES:

A. Preconstruction Wave Equation Analyses:

1. Two weeks prior to driving the indicator piles, submit the driving equipment data to Engineer. Engineer will use the submitted information to perform a wave equation analyses. The wave equation analyses performed by the Engineer will be used to assess the ability of the Piling Subcontractor's proposed driving system to install the pile to the required capacity and desired penetration depth within the allowable driving stresses.
2. Approval of the proposed driving system by Engineer shall be based upon the wave equation analyses indicating that the proposed driving system can develop the ultimate pile capacities as identified by the Engineer at an acceptable driving resistance not greater than 10 to 20 blows per inch within allowable driving stress limits. Engineer will propose a preliminary driving criterion based on this wave equation analysis and anticipated soil strength changes after driving, subject to further dynamic testing results.
3. A new pile driving system, modifications to existing system, or new pile installation procedures shall be proposed by Piling Subcontractor if the pile installation stresses predicted by wave equation analysis or calculated by the Pile Driving Analyzer exceed the following maximum values:
   a. Definitions:
      (1) F_y: Yield stress of section
   b. Steel Pile Sections:
      (1) Compressive Stress: $0.9 \times F_y$
      (2) Tensile Stress: $0.9 \times F_y$

B. Dynamic Monitoring:
   1. Dynamic monitoring shall be performed during driving in accordance with ASTM D4945, and as directed by Engineer. Dynamic testing data shall be recorded on every blow throughout monitoring for all piles monitored at the site.
   2. An experienced civil/structural/geotechnical engineer provided by Dynamic Testing Consultant shall operate the Pile Driving Analyzer in the field and be certified at a minimum level of BASIC (second of four levels) on the PDI/PDCA Dynamic Measurement and Analysis Proficiency Test or the Foundation QA High Strain Dynamic Pile testing Examination to perform all monitoring and reporting activities.
   3. Dynamic Testing Consultant shall take measures to ensure that the location of strain gage placement does not impact the accuracy of the ultimate compression capacity of the piling per Pile Driving Analyzer and CAPWAP analyses (check proportionality values).
   4. The installation equipment (hammer, cushion, cap-block, follower) and methods during the driving of the indicator piles shall be the same as that used for production pile driving. Each additional hammer and equipment setup including one of identical make and model shall require performance evaluation (including Pile Driving Analyzer) and Engineer's subsequent approval.
   5. Installation of indicator piles is typical of normal pile installation except Dynamic Testing Consultant may frequently stop driving to request changes in the hammer fuel setting, or to check the PDA gauges and equipment. If requested, provide Dynamic Testing Consultant access to the head of the pile to check the gauge and cable attachments, change gauges, or perform similar work. Provide a qualified member of the pile driving crew to assist the Dynamic Testing Consultant with such work as directed.
   6. Cushions and hammer fuel settings: Combinations of hammer cushions and thicknesses, and hammer fuel settings shall be investigated during the testing. Piling Subcontractor shall cooperate with Engineer by installing the indicator piles using combinations of cushion material and thicknesses, and hammer fuel settings selected by Engineer. Change cushions, or change hammer fuel settings when requested by Engineer.

C. Indicator Pile Program:
   1. Purpose: To identify and confirm permanent pile driving characteristics at various locations and develop information to establish length variations resulting from changes of bearing stratum elevation or characteristics not disclosed in soils investigation data; and to evaluate performance of proposed installation equipment and methods, determine required installation procedures, and establish tentative installation criteria. The specific objectives of the program include:
      a. Evaluate stresses in the pile during installation considering cushion material and thickness and hammer fuel settings.
      b. Evaluate driving procedures on rate of installation and ability to achieve the required ultimate capacity.
      c. Evaluate hammer performance relative to the ability of the hammer to deliver the specified minimum impact stress and transferred energy.
      d. Evaluate the effectiveness of pile driving equipment and procedures to adequately control pile position and alignment during pile installation without damaging the piles.
      e. Develop data to aid in determining production pile tip elevations. Included in this data is the minimum penetration depth to achieve required pile capacity.

f. Establish tentative installation procedures and criteria including requirements for hammer fuel settings, and refusal blow count criteria.

2. Indicator piles shall be driven to an ultimate pile capacity and corresponding driving resistance as indicated by Engineer based upon the preliminary driving resistance indicated by wave equation results. Adjustments to the preliminary driving criteria may be made by Engineer based upon the dynamic testing results of both initial driving and restrike tests.
3. All indicator piles shall be redriven with dynamic testing after the specified minimum waiting period, as specified in the applicable Foundation Piling Section. The restrike shall be performed with a warmed up hammer and shall consist of striking the piles for 50 blows or until the pile penetrates an additional three inches, whichever occurs first. In the event the pile movement is less than ½ inch during the restrike, the restrike may be terminated after 20 blows. To facilitate dynamic testing of piles, all indicator piles shall be 5 feet longer than that anticipated due to the soil conditions.

3.03 DYNAMIC TESTING REPORTS

A. The Dynamic Testing Consultant shall prepare a written report of the dynamic testing operations. This report shall include a discussion of the pile capacity results obtained from the dynamic testing. The report shall also discuss hammer and driving system performance, driving stress levels, and pile integrity. The report data shall be provided to Engineer for review immediately upon completion of each dynamic pile testing operation, and prior to installation of further production piling. Dynamic Testing Consultant shall provide Engineer with electronic copies of the W01/X01 data files generated during the dynamic testing immediately upon completion of each dynamic pile testing operation.
B. CAPWAP analyses of the dynamic pile testing data shall be performed on data obtained from the end of initial driving and the beginning of restrike for all indicator piles.
C. A percentage of the remaining production piles monitored with dynamic pile testing shall also have CAPWAP analysis performed as selected by the Engineer. This percentage shall be as specified in the applicable Foundation Piling Section.
D. Engineer may request additional CAPWAP analyses at selected pile penetration depths to investigate potential alternate bearing layers.
E. Engineer may request that Dynamic Testing Consultant perform a refined wave equation analysis or analyses based upon the variations in the subsurface conditions and/or drive system performance observed during dynamic pile testing.
F. Engineer will perform evaluation of all dynamic testing reports for the development of appropriate driving resistance criteria for the project.

END OF SECTION 310817

SECTION 316217 – FOUNDATION PILING (STEEL H-PILES)

PART 1 - GENERAL

1.01 SUMMARY:

A. Work under this Section consists of furnishing all labor, equipment, and materials necessary to install all foundation piling for the structures.

B. Pile capacity shall be as follows:

1. The design compression capacity of each pile shall not be less than 60 tons, unless otherwise noted.
2. The design tension capacity of each pile shall not be less than 20 tons, unless otherwise noted.
3. The design lateral capacity of each pile shall not be less than 3.0 tons in the strong-axis direction and 2.5 tons in the weak-axis direction, unless otherwise noted.

C. Dynamic pile load testing shall be performed on select piles as described herein, and in the applicable Load Testing Sections as referenced in ARTICLE 1.02.B of this SECTION. The ultimate capacity of each pile tested shall confirm the following minimum safety factor values:

1. 2.25 times the design compression capacity.
2. 2.25 times the design tension capacity.

D. Contractor and/or Subcontractor shall visit the Site prior to bidding to observe and review specific Site conditions and requirements for equipment, methods, and costs to install piling.

E. Contractor shall verify the location of all underground conduits, piping, duct banks, and utilities prior to pile driving.

1.02 REFERENCES:

A. Applicable Standards:

1. American Society for Testing and Materials (ASTM):
   a. A27/A27M - Steel Castings, Carbon, for General Application.
   b. A108/A108M – Steel Bar, Carbon and Alloy, Cold-Finished.
   c. A148/A148M - Steel Castings, High Strength, for Structural Purposes.
   d. A572/A572M – High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
2. American Welding Society (AWS):
   a. D1.1 - Structural Welding Code.
3. Kentucky Building Code (2007).

B. Related Work Specified Elsewhere:

1. Dynamic Pile Testing: SECTION 310817.

1.03 EXPERIENCE QUALIFICATIONS:

A. The Contractor or Subcontractor to perform Work shall have a minimum of five years' experience installing steel H-section piles.

B. The name of the proposed Subcontractor along with his experience statement of past work shall be submitted at time of Bid and will be considered in the evaluation of Bids.

C. All other guidelines for submitting Subcontractor information shall be followed in accordance with "INSTRUCTIONS TO BIDDERS."

1.04 SUBMITTALS AND CONSTRUCTION RECORDS:

A. Submittals:

1. Submit details of proposed piles and pile-driving equipment to Engineer at least two weeks prior to driving piling. The information shall include:
   a. Make and model of pile-driving hammer.

b. Weight, stiffness, and coefficient of restitution of capblock assembly, cushion dimensions, type of cushion material, and cushion stiffness.
c. Location and type of splices, if present.
d. Details of proposed dynamic load testing operations, as specified in the respective load testing SECTION.

B. Construction Records:
1. During pile driving, including the installation of the test pile and reaction piles (if used), submit to the Resident Project Representative, in triplicate, each day a record of each pile driven, including, but not limited to:
a. Name of structure.
b. Pile cap number.
c. Pile number.
d. Pile length after cutoff.
e. Elevation of pile tip and cutoff.
f. Ground surface elevation during driving.
g. Location and type of splices, if present.
h. Date and time of day pile is driven.
i. Continuous driving resistance and pressure gauge readings or hammer stroke.
j. Hammer speed.
k. Final driving resistance and pressure gauge readings or hammer stroke.
l. Driving time.
m. Jetting and predrilling diameters and depths.
n. Heaving records.
o. Redriving data.
p. Remarks concerning installation of piles.

1.05 FIELD MARKING AND ELEVATIONS:

A. For driven piles, provide ground surface elevation reference and mark each pile along its entire length at 1-foot intervals and along at least the last foot of driving at 1-inch increments, so as to permit determination of the pile tip elevation and corresponding driving resistances during driving.

PART 2 - PRODUCTS

2.01 DRIVEN STEEL H-SECTION PILES:

A. Pile section shall consist of HP10x42 piles.
B. Piles shall be manufactured of steel conforming to ASTM A572 (Grade 50 ksi).
C. Piles shall not have a camber or sweep in excess of the permitted mill tolerance.
D. Store on platforms, skids, or other supports at the Site and support to prevent excessive deflection.
E. Pile points shall be reinforced with APF Pruyn 75750 points or approved equal.
1. Pile points shall be manufactured in one piece of cast steel conforming to ASTM A27 Grade 65/35 or ASTM A148 Grade 90/60.
2. Points shall fully enclose the web of the pile with a continuous vertical backup. Pile point backups shall also extend from the inner corners of the flanges to a sufficient distance to assume proper alignment and fitting.

3. The bearing surface shall have a minimum of 7 integrally cast teeth; one centered on the web axis and 3 located along each flange axis.
4. Points shall have cast or cut bevels to provide proper weld surface.
5. Pile points shall be attached in accordance with manufacturer's recommendations. Welding of point to piles shall be performed by a certified welder. Contractor shall be fully responsible for the adequacy of welds during driving.
6. Points shall not have excessive surface defects such as pinholes, shrinkage tears, sand inclusions, or gas pockets which affect the integrity of the casting. Castings shall not be visibly warped and/or cause improper fit. Maximum allowable out of square tolerance is 1/8 inch in 12 inches.
7. For conditions where the moderate driving is anticipated due to relatively soft bedrock conditions, the minimum pile point weight shall be in accordance with the following:

Pile Size	Minimum Pile Point Weight (lbs)
HP10	15.0
HP12	23.0
HP14	33.0

F. Anchorage plates shall conform to ASTM A572 (Grade 50 ksi).
G. Headed studs shall conform to ASTM A108.

2.02 PILE DRIVING EQUIPMENT:

A. Pile Driving Hammer:
1. Piles shall be driven with an approved single, partial double-acting or double-acting air, diesel, or hydraulic hammer with minimum driving energies and ram weights as noted below:
   a. Air Hammer:
      (1) Minimum Energy: 20,000 foot-pounds.
      (2) Minimum Ram Weight: 6,000 pounds.
   b. Diesel Hammer:
      (1) Minimum Energy: 20,000 foot-pounds.
      (2) Minimum Ram Weight: 3,000 pounds.
2. Contractor shall submit details of the pile hammer to Engineer for approval at least two weeks prior to driving piles.
3. Should a change in hammer or driving equipment be necessitated by Contractor, Contractor shall submit these revised details to Engineer for approval at least two weeks prior to driving piles with revised equipment.
4. The pile driving hammer shall be operated at all times at speeds and conditions recommended by the hammer manufacturer.
5. The compressor capacities for the air-operated hammers shall be sufficient to operate the hammer continuously at the full-rated speed and energy.
6. For all partial double-acting and double-acting hammer types, the Contractor shall provide the applicable pressure gauge(s) to be located in a position such that it can be clearly read by the pile driver operator and Resident Project Representative to permit determination of the chamber pressure.
7. For all single-acting hammer types, the Contractor shall mark the ram such that it can be clearly read by the pile driver operator and Resident Project Representative to permit determination of the stroke.

8. The pile driver shall be equipped with fixed leads, secured to the pile driving rig with rigid bracing, and extending to the lowest point which the hammer must reach to drive the piles.
9. Pile driving hammer and driving equipment used for driving of production piles shall be the same equipment as that used for driving indicator piles, if required, unless otherwise approved by Engineer.

B. Capblock and Cushion:
1. Piles shall be protected during driving by a capblock-and-cushion assembly of approved design.
2. The capblock or cushion materials shall be replaced during driving if it has been damaged, highly compressed, charred, burned, or has become spongy or deteriorated in any manner.
3. Continuous or frequent introduction or addition of cushion materials shall not be permitted.
4. The driving helmet or capblock shall fit flush with the plane of the pile end so that a uniform impact force is applied to the pile during driving.
5. The cushion shall be fabricated from durable materials with referenced elastic and stiffness value properties. The cushion stiffness shall be determined as:

$$S = (AxE) / L$$

where:

S = Cushion stiffness (kip/in)
A = Cushion area (in^2)
E = Secant modulus of elasticity of cushion material (ksi)
L = Length or height of cushion (in)

6. The coefficient of restitution of the capblock-and-cushion assembly shall not be less than 0.8.
7. Contractor shall submit to Engineer for approval, details concerning the stiffness of the cushion assembly, the coefficient of restitution, and the weight of the capblock-and-cushion assembly at least two weeks prior to driving piles.
8. Capblock and cushion materials used for driving of production piles shall be the same equipment as that used for driving indicator piles, unless otherwise approved by Engineer.

PART 3 - EXECUTION

3.01 EQUIPMENT FOR DRIVING STRUCTURAL STEEL H-SECTION PILES:

A. All pile driving equipment shall be subject to Resident Project Representative's approval after inspection at the Site.
B. Equipment that is determined to be in poor operating conditions, in the opinion of the Resident Project Representative, at any time during the progress of the Work, will not be approved for pile driving.

3.02 DRIVING PROCEDURE:

A. Piles shall not be driven until inspected and approved for driving.

B. Each pile shall be driven continuously and without voluntary interruption until the specified penetration length and driving resistance have been obtained.
C. Piles shall be driven in contact with surrounding soil and left permanently in place.
D. Piles shall be driven in a sequential operation which will minimize heaving of adjacent piles.
E. Pile driving operations shall be suspended if impact shock results in problems to any adjacent structures or equipment until Contractor takes corrective measures.
F. No method requiring force to correct the position or line of any pile shall be permitted during driving.
G. Special precautions shall be taken to avoid oil spatter from pile driving equipment when working in the vicinity of existing structures, vehicles, and other permanent fixtures.
H. Pile driving areas shall be kept free from water at all times.
I. Drive piles with axes oriented as shown on the Drawings.

3.03 PENETRATION AND DRIVING RESISTANCE:

A. Piles shall be driven to achieve penetration into the underlying sandstone and/or shale deposits and then to the specified and minimum driving resistance.
B. The minimum final driving resistance will be determined by Engineer using the U.S. Department of Transportation, Federal Highway Administration Wave Equation Analysis of Pile Driving (WEAP) for the pile hammer and associated capblock-cushion materials and properties, as to be submitted and utilized for pile driving by Contractor and as determined in conjunction with the test pile program.
C. Contractor shall become familiar with conditions present at the Site prior to bidding; specifically should there be limited access dimensions, headroom clearances, or other conditions which restrict the use of particular driving equipment and thereby affect the associated minimum final driving resistance.

3.04 SPLICING:

A. Splice pile assembly before driving to produce a length adequate for anticipated penetration.
B. If the length of a pile assembly is insufficient to achieve the specified penetration and driving resistance, extend the driven assembly by splicing assembly of the same cross section.
C. Welding shall not be performed when the temperature of the base metal is lower than 0° F. At temperatures between 32° F and 0° F, the surface of all areas within 3 inches of the area where the weld is to be performed shall be heated uniformly to a temperature at least warm to the hand before any welding is done.
D. Splices shall be accurately aligned and welded as follows:
    1. Welders shall be previously qualified within the past twelve months by passing the tests prescribed in AWS D1.1.
    2. Welding process shall be shielded metal arc in accordance with AWS D1.1 using low hydrogen E70 electrodes.
    3. Flanges and web joints shall be welded using 45°, single-bevel butt-joints and with backup plates. Flanges shall be accurately aligned and all welds shall be 100% full penetration.
    4. Prefabricated APF Champion H-Pile Splicer HP30000 or approved equal may be used as follows:
        a. Prepare, attach, and weld splicer in accordance with manufacturer's requirements.

b. Provide as a minimum eight 5/16" x 2-1/2" fillet welds between the splicer and inside flanges at each corner of the splicer, along with 100% full penetration, 45°, single-bevel butt-jointed welds along both outside flanges.
c. All welds shall be adequate to handle driving stresses, compressive, uplift and shear ultimate loads and/or load test capacities, as specified.

E. After welding, permit sufficient time for weld to cool to touch prior to continuation of pile driving.
F. After splicing, piles shall be driven to the specified penetration and driving resistance.
G. Only one splice per pile shall be permitted.

3.05 HEAVING:

A. Heaving shall be checked on a selected reference pile within each pile group or cluster.
B. The reference pile shall be checked by comparison of elevations before and after driving of all adjacent piles within a group or cluster.
C. Heaving shall be considered as occurring to all piles within a group or cluster when the reference pile head elevation changes in excess of 0.025-foot.
D. Piles within a group or cluster shall be redriven when the reference pile heaves in excess of 0.025-foot.

3.06 REDRIVING:

A. A pile selected by Resident Project Representative from within the initial pile group or cluster driven shall be redriven not less than 4 hours and preferably 24 hours after completion of initial driving in order to check for relaxation or freeze. Relaxation is indicated by a lesser number of blows per inch required to mobilize the pile than was attained at completion of its original final driving resistance.
B. Pile shall be driven not less than the same number of blows originally applied to the pile over the final 6 inches of driving, after the hammer has warmed up. Driving resistance shall be noted for each inch of pile penetration. If redriving indicates relaxation, Engineer shall be notified. All piles within a pile group or cluster which has indicated relaxation shall be redriven until the driving resistance for the last inch indicates that specified pile capacities have been attained.
C. Redrive all piles within a group or cluster that have indicated heave of the reference pile.

3.07 CUTOFF:

A. Cut off piles perpendicular to the vertical axis of the pile and to within 1/2-inch of the cutoff elevation indicated.
B. Cut off portions of pile which are battered, split, warped, buckled, damaged, or imperfect within the upper reaches of the top. This does not apply to piles that have been rejected.
C. If excavation around the piles is required to achieve pile cut off, remove and dispose of the excavated material as directed by Resident Project Representative.
D. Remove waste steel H-section piles and dispose of off Site or as otherwise directed by Resident Project Representative.

3.08 PREDRILLING AND JETTING:

A. Predrilling or jetting will not be permitted without written approval of Engineer.
B. Where required, perform predrilling in advance of driving with a continuous flight auger to a depth not below the proposed final tip elevation.

C. Do not drill hole larger than the pile depth/width.
D. Remove waste from drilling operations as directed by Resident Project Representative.

3.09 INSTALLATION TOLERANCES:

A. Piles shall not exceed a variation from the vertical axis of the pile of more than 1/4-inch per foot of pile length.
B. The center of the pile head shall not vary from plan location at cutoff by more than 3 inches.

3.10 ANCHORAGE STEEL PLACEMENT:

A. Remove all foreign matter from pile prior to attaching anchorage steel.
B. Anchor for uplift as indicated on Contract Drawings.
C. Anchorage steel shall not be attached to piles prior to initial inspection by Resident Project Representative. Anchorage steel shall not be attached to rejected piles.

3.11 REJECTED PILES:

A. Resident Project Representative will determine the acceptability of all piles driven and may, at his option, reject those piles which do not conform to the Drawings and Specifications.
B. As directed by Resident Project Representative, Contractor shall perform one of the following:
   1. Leave piles in place, cut off as directed, and drive one or more new piles in locations designated by Resident Project Representative to replace the rejected pile and maintain symmetry of the pile group or cluster.
   2. Withdraw the pile and drive a new pile. Any holes which result from pile withdrawal shall be packed with sand, gravel, or other approved nonplastic soil before redriving of the replacement pile.

3.12 TEST PILE PROGRAM:

A. Indicator Piles:
   1. The Contractor shall install ten (10) indicator piles at locations to be determined by the Engineer.
   2. Indicator piles may be installed at production pile locations.
   3. Indicator piles shall be installed in accordance with procedures required for production piles and Contractor shall submit to Resident Project Representative a record of each indicator pile placed including all information required for production piles.
B. Dynamic Pile Testing:
   1. Contractor shall secure the services of a Dynamic Testing Consultant.
   2. Dynamic pile testing shall be conducted on all indicator piles during the entire duration of initial driving and during restrike driving operations.
   3. Restrike driving shall be performed a minimum of 72 hours following completion of initial pile installation.
   4. CAPWAP analysis of the dynamic pile testing data shall be performed on data obtained from the end of initial driving and the beginning of restrike driving for all indicator piles.
   5. Dynamic pile load testing shall be performed only in the presence of the Engineer.
   6. Dynamic pile load testing shall be performed in accordance with the requirements outlined in the applicable Pile Load Testing Section, as referenced in ARTICLE 1.02.B of this SECTION.

3.13 MEASUREMENT AND PAYMENT:

A. Measurement:
   1. Pay length shall be defined as that length of the pile measured from the pile tip to the cutoff elevation indicated.
   2. Include only those piles meeting the requirements of these Specifications.
   3. Do not include broken, withdrawn, collapsed, misplaced, or rejected piles.

B. Payment:
   1. Include in the Lump Sum Contract Price the cost for:
      a. Mobilization and demobilization of all required equipment for installation of foundation piling, complete and in place.
      b. Test Pile Program.
      c. Surveying to locate piling and the cost to remove and dispose of spoil or waste.
      d. All splices, complete and in place.
      e. All pile points, complete and in place.
   2. Adjust payment for any deviations in the quantities indicated on the Contract Drawings at the single Adjustment Unit Prices set forth in the Agreement for any increase or decrease in the following:
      a. Aggregate pay length (unit price per foot) due to change in length of individual piles or change in the number of piles.
      b. Quantity of pile splices.
      c. Quantity of pile points.

END OF SECTION 316217

AWINGS

TAILS AND GENERAL NOTES

REFERENCE

TITLE

TOPOGRAPHIC SURV
AIR TOXICS STANDA

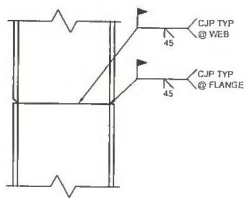
GREEN STATION OU

GENERAL NOTES: (APPLICABLE TO THIS DRAWING)

1. ALL DETAILS AND NOTES ON THIS DRAWING ARE BURNS & McDONNELL STANDARDS WITHOUT RESPECT TO CONTRACTS. USE ONLY THOSE DETAILS AS CALLED FOR ON PLANS, SPECIFIED OR AS REQUIRED TO ACCOMPLISH THE WORK.

ABBREVIATIONS

AA	- ALUMINUM ASSOCIATION	DBL	- DOUBLE	JT	- JOINT	R	- RISER
AB	- ANCHOR BOLT	DET	- DETAIL	KB	- KNEE BRACE	RAD	- RADIUS
ABT	- ABOUT	DIAG	- DIAGONAL	KPL	- KICK PLATE	RD	- ROOF DRAIN
ACI	- AMERICAN CONCRETE INSTITUTE	DIA	- DIAMETER	KSI	- KIPS PER SQUARE INCH	REF	- REFERENCE
ADH	- ADHESIVE	DIM	- DIMENSION			REINF	- REINFORCE
AGGR	- AGGREGATE	DK	- DECKING	LAD	- LADDER	REQD	- REQUIRED
AHR	- ANCHOR	DL	- DEAD LOAD	LB	- POUND	REV	- REVISION
AISI	- AMERICAN IRON AND STEEL INSTITUTE	DN	- DOWN	L	- LONG	RM	- ROOM
AISC	- AMERICAN INSTITUTE OF STEEL CONSTRUCTION	DWL	- DOWEL	LL	- LIVE LOAD	S	- SOUTH
		DWG	- DRAWING	LLH	- LONG LEG HORIZONTAL	SCHED	- SCHEDULE
AL	- ALUMINUM	E	- EAST	LLV	- LONG LEG VERTICAL	SE	- SOUTHEAST
ALTN	- ALTERNATE	EA	- EACH	LONG	- LONGITUDINAL	SECT	- SECTION
ANSI	- AMERICAN NATIONAL STANDARD INSTITUTE	ED	- EQUIPMENT DRAIN	LPT	- LOW POINT	SH	- SHEET
		EF	- EACH FACE	LNTL	- LINTEL	SIM	- SIMILAR
APPROX	- APPROXIMATE	EJ	- EXPANSION JOINT	LS	- LAP SPLICE	SLP	- SLOPE
ARCH	- ARCHITECT	EL	- ELEVATION	MATL	- MATERIAL	SLV	- SLEEVE
ASTM	- AMERICAN SOCIETY FOR TESTING OF MATERIALS	ELEC	- ELECTRICAL	MAX	- MAXIMUM	SP	- SPACE
		ELEV	- ELEVATOR	MECH	- MECHANICAL	SPEC	- SPECIFICATION
AWS	- AMERICAN WELDING SOCIETY	EMBED	- EMBEDMENT	MEZZ	- MEZZANINE	SQ	- SQUARE
BC	- BOLT CIRCLE	EQ	- EQUAL	MFR	- MANUFACTURER	SST	- STAINLESS STEEL
BETW	- BETWEEN	EQUIV	- EQUIVALENT	MH	- MANHOLE	STD	- STANDARD
BLDG	- BUILDING	EQ SP	- EQUALLY SPACED	MIN	- MINIMUM	STL	- STEEL
BM	- BEAM	EQUIP	- EQUIPMENT	MISC	- MISCELLANEOUS	STIF	- STIFFENER
BOS	- BOTTOM OF STEEL	EXIST	- EXISTING	MK	- MARK	STIR	- STIRRUP
BOT	- BOTTOM	EXP	- EXPANSION			STR	- STRAIGHT
BRG	- BEARING	EXT	- EXTERIOR	N	- NORTH	STRL	- STRUCTURAL
BRKT	- BRACKET	EW	- EACH WAY	NA	- NOT APPLICABLE	STRUC	- STRUCTURE
CAP	- CAPACITY	FAB	- FABRICATE	NE	- NORTHEAST	SW	- SOUTHWEST
C/C	- CENTER TO CENTER	FD	- FLOOR DRAIN	NF	- NEAR FACE	SYMM	- SYMMETRICAL
CL	- CENTER LINE	FDN	- FOUNDATION	NOM	- NOMINAL	TEMP	- TEMPORARY
CF	- CUBIC FEET	FF	- FAR FACE	NW	- NORTHWEST	THK	- THICK
CHKR	- CHECKER	FL	- FLOOR	NIC	- NOT IN CONTRACT	THRU	- THROUGH
CIR	- CIRCLE	FLG	- FLANGE	NTS	- NOT TO SCALE	THD	- THREAD
CJ	- CONSTRUCTION JOINT	FNSH	- FINISH	NO	- NUMBER	TOB	- TOP OF BOLT
CLR	- CLEAR	FS	- FAR SIDE	NS	- NEAR SIDE	TOC	- TOP OF CONCRETE
CLJ	- CONTROL JOINT	FT	- FEET			TOG	- TOP OF GRATING
CMU	- CONCRETE MASONRY UNIT	FUT	- FUTURE	OC	- ON CENTER	TOS	- TOP OF STEEL
CO	- CONCRETE OPENING	GA	- GAGE	OD	- OUTSIDE DIAMETER	T&B	- TOP & BOTTOM
CONC	- CONCRETE	GALV	- GALVANIZE	OF	- OUTSIDE FACE	TRD	- TREAD
CONT	- CONTINUOUS	GND	- GROUND	OPNG	- OPENING	TYP	- TYPICAL
CONTR	- CONTRACT	GR	- GRADE	OPP	- OPPOSITE	UBC	- UNIFORM BUILDING CODE
COL	- COLUMN	GRTG	- GRATING	OSHA	- OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	UNO	- UNLESS NOTED OTHERWISE
CONN	- CONNECTION	HEX	- HEXAGON	OZ	- OUNCE	VAR	- VARIES
COR	- CORNER	H	- HIGH	PED	- PEDESTAL	VERT	- VERTICAL
COORD	- COORDINATE	HR	- HANDRAIL	PEN	- PENETRATE	W	- WEST
CRSI	- CONCRETE REINFORCING STEEL INSTITUTE	HPT	- HIGH POINT	PERP	- PERPENDICULAR	W	- WIDE
		HORIZ	- HORIZONTAL	PJNT	- PROJECTION	W/	- WITH
CTR	- CENTER	HS	- HIGH STRENGTH	PL	- PLATE	W/O	- WITHOUT
CY	- CUBIC YARD	IBC	- INTERNATIONAL BUILDING CODE	PREFAB	- PREFABRICATED	WP	- WORK POINT
		ID	- INSIDE DIAMETER	PSF	- POUNDS PER SQUARE FOOT	WT	- WEIGHT
		IF	- INSIDE FACE	PSI	- POUNDS PER SQUARE INCH	WWF	- WELDED WIRE FABRIC
		INTR	- INTERIOR	PVC	- POLYVINYL CHLORIDE	WD	- WIDTH
		INVT	- INVERT				



PILE SPLICE DETAIL

NOTES:

1. APF CHAMPION H-PILE SPLICER HA-30000 OR APPROVED EQUAL MAY BE USED.
2. SEE SPECIFICATION SECTION 316217 FOR ADDITIONAL INFORMATION.

GENERAL DESIGN NOTES:

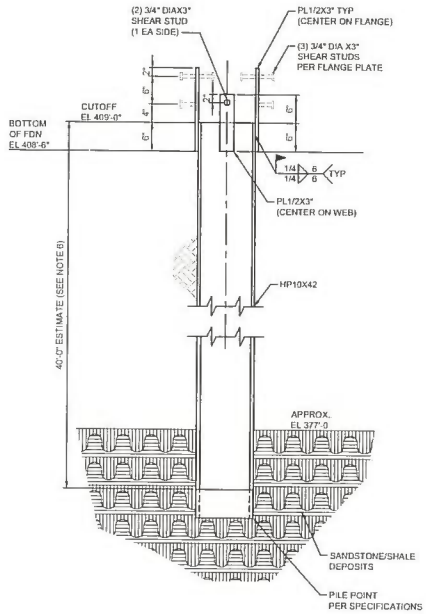
1. BUILDING CODE OF RECORD: ALL WORK SHALL BE IN ACCORDANCE WITH 9TH EDITION (2007) OF KENTUCKY BUILDING CODES AND THE INTERNATIONAL BUILDING CODE (IBC 2006) INCLUDING ALL APPENDICES, AMENDMENTS, AND REFERENCE STANDARDS.
2. WIND DESIGN: PER IBC 2006 TO INCLUDE THE FOLLOWING:
   a. 90 MPH BASIC GROUND WIND SPEED
   b. EXPOSURE C
   c. SURFACE ROUGHNESS C
   d. OCCUPANCY CATEGORY III
   e. IMPORTANCE FACTOR, I_w= 1.15
   f. NO WIND SHIELDING SHALL BE TAKEN INTO ACCOUNT
   g. DESIGN TO INCLUDE TOPOGRAPHIC K_{zt} OF 1.0 AND DIRECTIONALITY K FACTORS AS APPLICABLE PER CODE.
   h. STRUCTURES AND EQUIPMENT TO BE PERMANENTLY LOCATED INDOORS SHALL BE DESIGNED FOR NO LESS THAN 5 PSF WIND LOAD.

GENERAL DESIGN NOTES CONT:

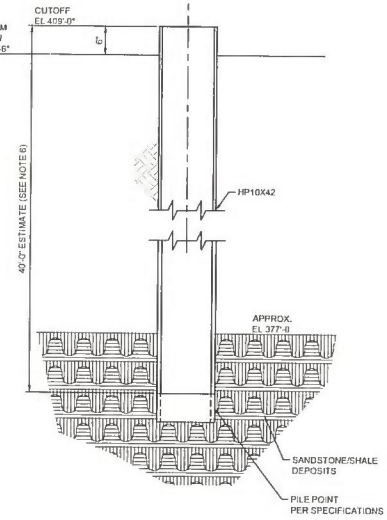
3. ICE LOADS: PER 9TH EDITION (2007) OF KENTUCKY BUILDING CODE ON NON-ENCLOSED STRUCTURES TO INCLUDE THE FOLLOWING:
   a. NOMINAL ICE THICKNESS t = 0.75 INCHES
   b. ICE IMPORTANCE FACTOR - THICKNESS, I_t = 1.25
   c. ICE IMPORTANCE FACTOR - WIND, I_w = 1.00
   d. CONCURRENT WIND SPEED = 30 MPH
4. SNOW DESIGN: PER 9TH EDITION (2007) OF KENTUCKY BUILDING CODE TO INCLUDE THE FOLLOWING:
   a. GROUND SNOW LOAD p_g = 15 PSF
   b. SNOW IMPORTANCE FACTOR I_s= 1.10
   c. EXPOSURE C_e 0.9 AND THERMAL C_t 1.0 FOR HEATED ENCLOSURES
   d. EXPOSURE C_e 0.9 AND A THERMAL C_t 1.2 FOR UNHEATED ENCLOSURES

GENERAL DESIGN NOTES CONT:

5. SEISMIC DESIGN: PER 9TH EDITION (2007) OF KENTUCKY BUILDING CODE, TO INCLUDE THE FOLLOWING:
   a. SEISMIC IMPORTANCE FACTOR, I_e= 1.25
   b. SITE CLASS D
   c. SEISMIC DESIGN CATEGORY D
   d. SHORT PERIOD S_s= 0.851g, 1 SECOND PERIOD S_1= 0.187g
   e. RISK CATEGORY III
6. FROST DEPTH: 2'-0" BELOW GRADE



ELEVATION
H-PILE UPLIFT DETAIL
TYPE A



ELEVATION
H-PILE COMPRESSION DETAIL
TYPE B

GENERAL DESIGN NOTES:

1. SEE SPECIFICATION SECTION 316217 FOR PILE INSTALLATION REQUIREMENTS.
2. SEE SPECIFICATION SECTION 316817 FOR DYNAMIC PILE TESTING REQUIREMENTS.
3. MATERIALS:
   HP PILES: A572 GR50
   PLATE: A572 GR 50
   HEADED STUDS: A108
4. FOR ASTM A572 GR 50 STEEL, USE E70 LOW HYDROGEN ELECTODES FOR SHIELDS METAL ARC WELDING.
5. PILE IDENTIFACTION SYSTEM:
   P1-A-1
   - PILE IDENTIFIER
   - INDICATOR FOR PILE TESTING (SEE NOTE 6)
   - PILE TYPE IDENTIFIER
6. PILES SHALL BE DRIVEN TO ACHIEVE PENETRATION INTO THE UNDER LYING SANDSTONE AND/OR SHALE DEPOSITS AND THEN TO THE SPECIFIED AND MINIMUM DRIVING RESISTANCE. FINAL DRIVING CRITERIA SHALL BE DETERMINED DURING THE TEST PILE PROGRAM.
7. PILE CAPACITIES USED FOR STRUCTURAL DESIGN:
   COMPRESSION: 60T
   UPLIFT: 20T
   LATERAL CAPACITY:
   STRONG AXIS: 3.0T
   WEAK AXIS: 2.5T
8. PILES MARKED WITH "*" AFTER PILE TYPE IDENTIFIER ARE FOR PILE TESTING PROGRAM. REFER TO SPECIFICATION SECTIONS 316817 AND 316217 FOR MORE INFORMATION.

ISSUED FOR CONSTRUCTION

STATE OF KENTUCKY
STANLEY C LAWSON
26539
LICENSED PROFESSIONAL ENGINEER

Stanley C Lawson

Apr 15 2014

no.	date	by	ckd	description
1	04/15/14	JM	JG	ISSUED FOR CONSTRUCTION
0	03/04/14	JM	JG	ISSUED FOR BID

BIG RIVERS ELECTRIC CORPORATION
ROBERT D. GREEN STATION UNITS 1 & 2

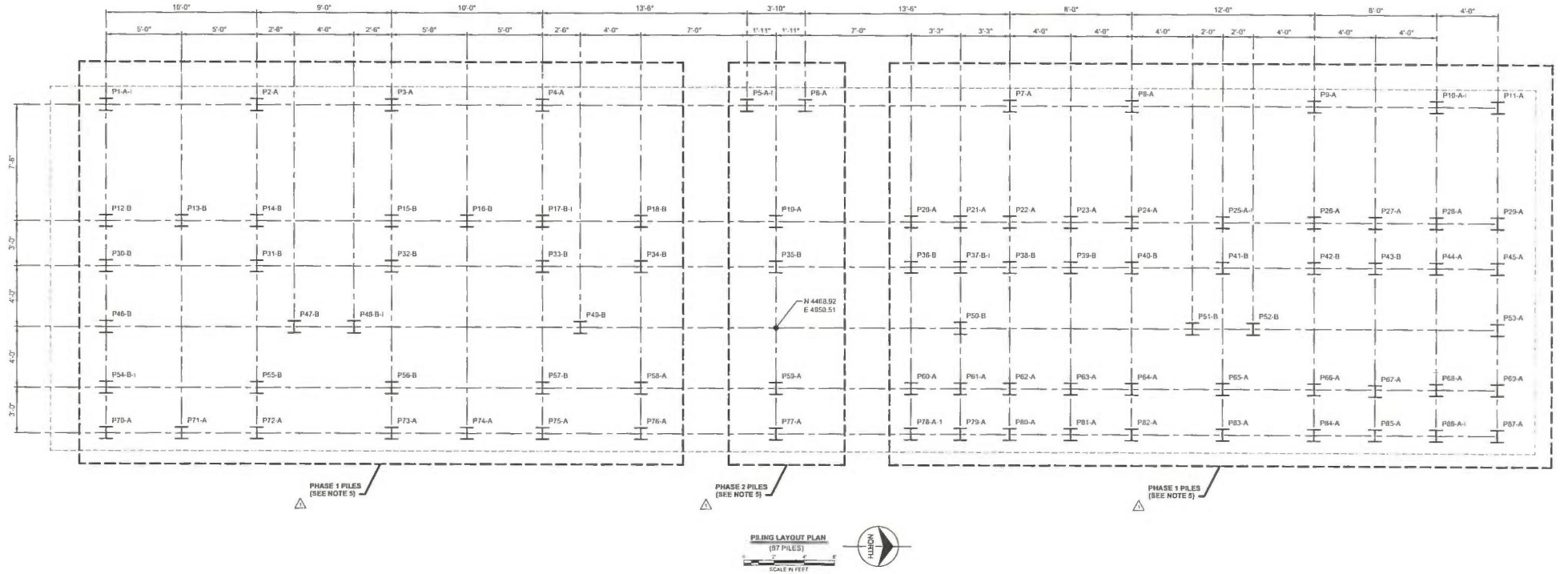
Burns & McDonnell
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400

designed: J. MASSA | detailed: L. SINGLETON

BIG RIVERS GREEN STATION
STANDARD PILING DETAILS AND GENERAL NOTES

project 73827 | contract 8210
drawing SP110 | rev. 1
sheet | of | sheets
file 73827SP110.dwg

M:\BIG_RIVERS\73827\CAD\STRUCT\GREEN\WORKSPACE\PILING - 8210\73827-SP110.DWG 4/15/2014 12:55 PM LSINGLETON



PILING LAYOUT PLAN
(87 PILES)
SCALE IN FEET

SURVEY CONTROL

STATION NO	NORTHING(Y)	EASTING(X)	ELEV(Z)	DESCRIPTION
C.P. 3	4,522,750	4,954,023	411.61	2.5" P.K. NAIL SET IN THE CENTER OF A 2" DIAMETER WASHER
C.P. 4	4,370,500	4,957,912	411.59	2.5" P.K. NAIL SET IN THE CENTER OF A 2" DIAMETER WASHER

COORDINATES SHOWN ARE BASED ON EXISTING PLANT SURVEY CONTROL SHOWN BY DRAWING OF BIG RIVERS PROPERTY PREPARED BY BRANSON SURVEYS, INC. DATED JANUARY 10, 1984.

ELEVATIONS SHOWN ARE BASED ON EXISTING MONUMENT "BM#1" ELEVATION 423.85 (SEE DWG. NO. C005 BY BURNS AND ROE, INC.)

NOTES:

1. SEE DRAWING SP110 FOR STRUCTURAL STANDARD PILING DETAILS AND GENERAL NOTES.
2. SEE SPECIFICATION SECTION 316217 FOR PILE INSTALLATION REQUIREMENTS.
3. SEE SPECIFICATION SECTION 310817 FOR DYNAMIC PILE TESTING REQUIREMENTS.
4. PILES MARKED WITH "*" AFTER PILE IDENTIFIER ARE FOR PILE TESTING PROGRAM. REFER TO SPECIFICATION SECTIONS 310817 AND 316217 FOR MORE INFORMATION.
5. ⚠ IN ORDER TO FACILITATE INSTALLATION OF THE RETAINING WALL (BY OTHERS), THE PILING WORK SHALL BE PERFORMED IN TWO PHASES: PHASE 1 AND PHASE 2. CONTRACTOR SHALL COORDINATE MOBILIZATION AND DEMOBILIZATION ACTIVITIES ACCORDINGLY. SEE SPECIFICATION FOR WORK SEQUENCE DATES.

ISSUED FOR CONSTRUCTION

STATE OF KENTUCKY — STANLEY C LAWSON 26539 — LICENSED PROFESSIONAL ENGINEER

Stanley C Lawson

Apr 15 2014

no.	date	by	ckd	description
2	04/15/14	JM	JG	ISSUED FOR CONSTRUCTION
1	03/13/14	JM	JG	ISSUED WITH ADDENDUM NO. 2
0	03/4/14	JM	JG	ISSUED FOR BID

BIG RIVERS ELECTRIC CORPORATION
ROBERT D. GREEN STATION UNITS 1 &2

Burns & McDonnell
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400

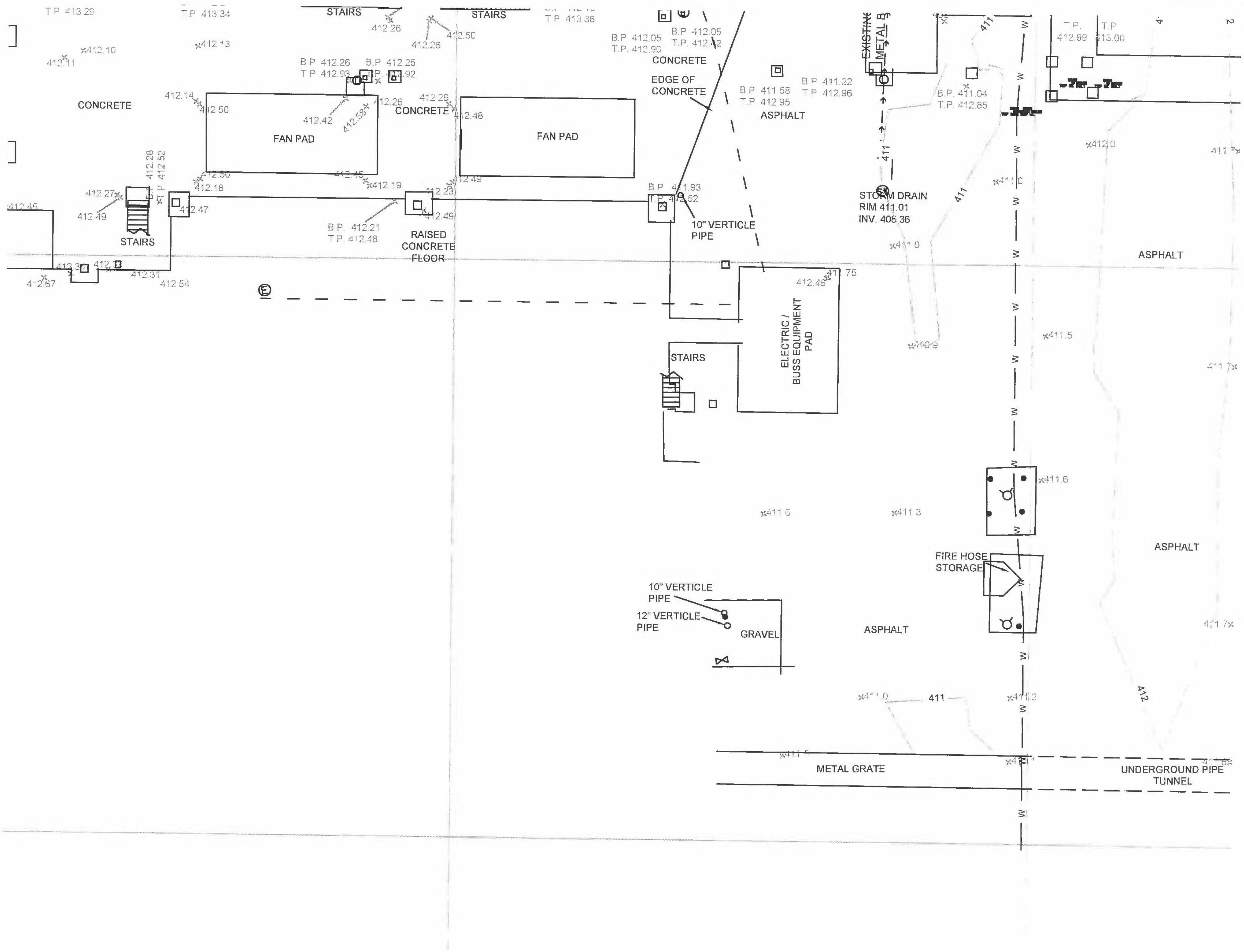
designed: J. MASSA | detailed: L. SINGLETON

BIG RIVERS GREEN STATION
PILING LAYOUT PLAN

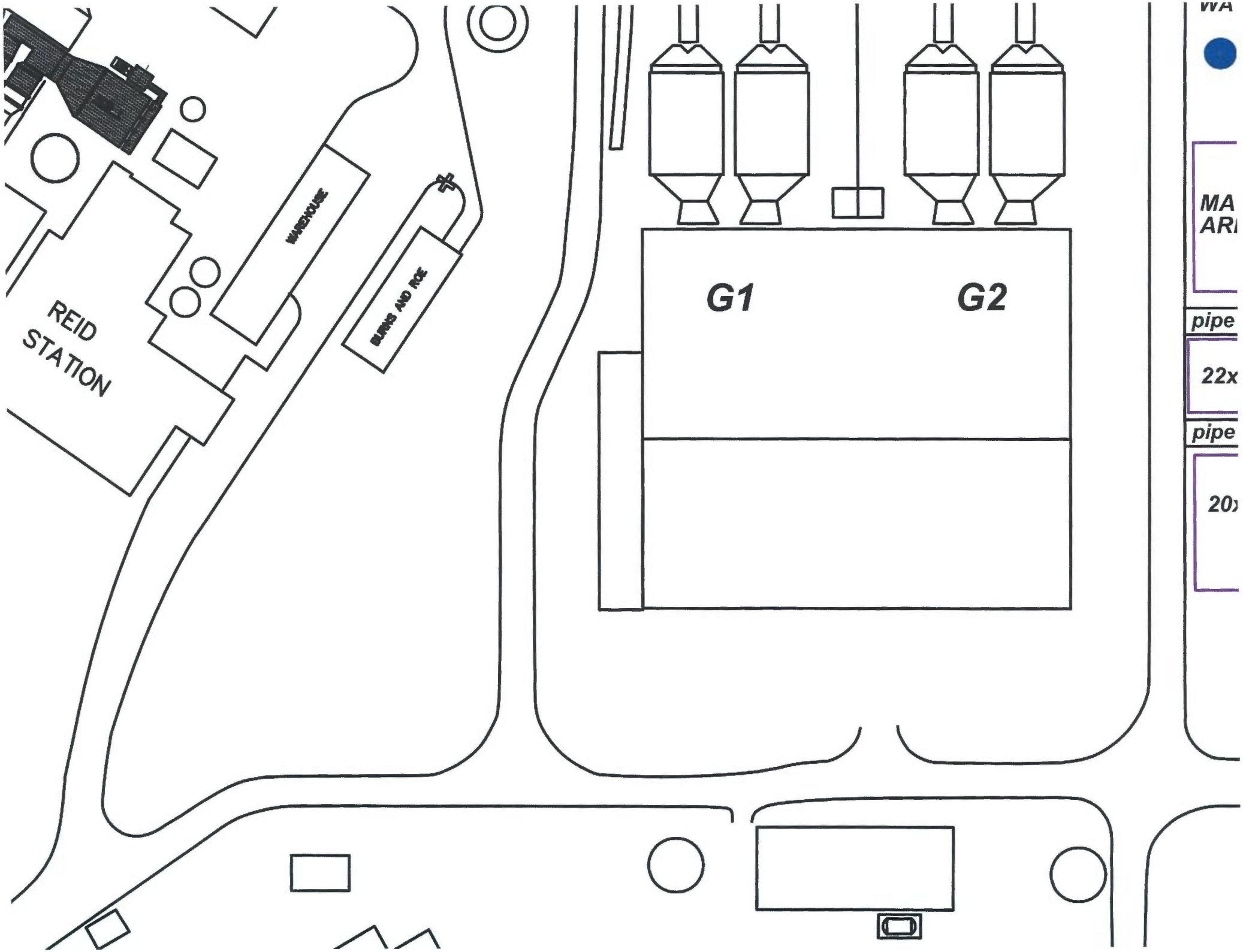
project 73827 | contract 8210
drawing SP111 | rev. 2
sheet | of | sheets
file: 73827SP111.dwg

M:\BIG_RIVERS\73827\CAD\STRUCTURES\GREEN\WORKSPACE\PILING_82\W73827-SP111.DWG 4/15/2014 1:02 PM LSINGLETON

Reference Drawings



STAIRS
STAIRS
CONCRETE
FAN PAD
FAN PAD
CONCRETE
B.P 412.26
T.P 412.93
B.P 412.25
STAIRS
B.P. 412.21
T.P. 412.48
RAISED CONCRETE FLOOR
CONCRETE
EDGE OF CONCRETE
B.P 412.05
T.P. 412.90
B.P 411.58
T.P 412.95
B.P 411.22
T.P 412.96
ASPHALT
B.P. 411.93
10" VERTICLE PIPE
STORM DRAIN
RIM 411.01
INV. 406.36
B.P. 411.04
T.P. 412.85
ASPHALT
ELECTRIC / BUSS EQUIPMENT PAD
STAIRS
ASPHALT
FIRE HOSE STORAGE
10" VERTICLE PIPE
12" VERTICLE PIPE
GRAVEL
ASPHALT
METAL GRATE
UNDERGROUND PIPE TUNNEL


REID
STATION
WAREHOUSE
BURNS AND ROE
G1
G2
pipe
22x
pipe
20

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
224711	0	1

SHIP TO:
R. D. Green Station
9000 HWY 2096
Robards,KY 42452

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR: **INDUSTRIAL CONTRACTORS SKANSKA INC**
PO BOX 208
EVANSVILLE, IN 47702-0208

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 14364	DELIVER TO	DATE OF ORDER/BUYER 08-APR-14 Toerne, Robert Frank	REVISED DATE/BUYER Toerne, Robert Frank
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6029 888-268-6219	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA BEST WAY POSSIBLE	VENDOR CONTACT/TELEPHONE (812) 464-7304

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

A signed copy of the General Services Agreement (GSA) is on file at Big Rivers Electric Corporation and is hereby incorporated by reference.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	SUPPLY AND INSTALL H-PILING PER SPEC GN-14-018, IC SKANSKA 3/26/2013 SUBMITTAL AND 4/3/2014 EMAIL FROM M. BROOKS	28-APR-14	288810	EACH	$ 1.00	$ 288,810.00

TOTAL $ 288,810.00

Robert F. Toerne

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

Pilot Trenching to Support the Design Efforts for the Proposed Mercury and Air Toxics Standard (MATS) Compliance Project

RFQ #HDQ-13-173

Table of Contents

1. Overview

1.1. Big Rivers Electric Corporation (Big Rivers) will be accepting bids to provide qualified labor, experienced supervision, tools, equipment, materials, consumables, and services as required to conduct pilot trenching in support of Burns & McDonnell's design efforts for the proposed Mercury and Air Toxics Standard (MATS) Compliance Project at the Big Rivers' Green Station near Robards, Kentucky. The trenching services are described in more detail throughout this specification. Attached drawing CJ001 identifies the location of each of the pilot trenches. The work shall include but not be limited to the following:

a. Excavation, sheeting, bracing and all operations necessary for the preparation of trenches for uncovering existing below-grade utilities, foundations, and other obstructions by means of a water or air jet/vacuum-extraction system.

b. Dewatering of pilot trenches.

c. Backfilling and compaction of pilot trenches.

1.2. If any conditions, circumstances or occurrences not covered in the Specification are encountered, or if there are any doubts as to the meaning, contact the designated representative.

1.3. The Contractor shall not assign, or sublet any part of the Work or this Specification without first obtaining Big Rivers' written approval. Such approval, if given, will not relieve the Contractor from full responsibility for the fulfillment of all obligations under this Specification.

1.4. Big Rivers Electric Corporation reserves the right to reject any or all Bids, to waive informalities therein and to consider exceptions and clarifications therein in order to determine the lowest and best bid; to reject any or all non-conforming, non-responsive, unbalanced or conditional Bids; to reject the Bid of any Contractor that it would not be in the best interest of the Project to make an award to that Contractor, whether because the Bid is not responsive or the Contractor is unqualified or of doubtful financial ability, or fails to meet any other pertinent standard or criteria established. The Company also reserves the right to negotiate contract terms with the successful Contractor. By submitting a Bid, the Contractor agrees that such procedures will be without liability for any damage or claim brought by the Contractor because of such rejections or procedures, nor will the Contractor seek any recourse of any kind against the Company because of such rejections or procedures. The filing of any Bid in response to this Invitation will constitute an agreement of the Contractor to these conditions.

2. Proposal Preparation and Submittal

2.1. All bids will be valid for ninety (90) days from the opening of the bid.

2.2. All bidders must complete and submit all documents listed within the Appendices.

2.3. The Bidder may submit a list of any sub-contractors that might be used for this project for pre-approval. The submittal must include experience lists and reference contacts for all proposed sub-contractors.

2.4. Any addenda to this request for quotation (RFQ) shall be signed by the Bidder and will be returned with the proposal.

2.5. Any deviations from or exceptions to the attached Specification, terms and conditions, or the submittals may impact the evaluation of the Bidder's proposal. If there are no exceptions or clarifications please so indicate on the Clarifications & Exceptions Form (Appendix B).

2.5.1. The terms and conditions set forth in the attached Specification and any required submittals are an important consideration to Big Rivers.

2.5.2. Any exception taken to the Specification must be justified in writing, i.e., safety, reliability, efficiency, and increase or decrease in cost.

2.6. The Bidder will submit sufficient information and detail with the bid to permit full understanding and evaluation of the equipment and services being offered.

2.7. The Bidder will itemize the proposal to reflect labor, equipment and materials separately as shown on the Submittal Form (Appendix A).

2.7.1. The Bidder may submit alternate bids, however, alternates will be considered only if a complete original bid is submitted.

2.7.2. The Bidder will submit time and material rates for any work on this project that may be classified as extra work by the Big Rivers. If the Bidder charges a separate rate for overtime and/or holiday pay, the Bidder will include a clear explanation of the overtime and holiday policies, and will include a list of all observed holidays. The Bidder will also provide a cost plus percentage markup for any materials that may be needed for additional/emerging work for this project. This percentage is to be factored on the base cost of the material before taxes are applied.

2.8. The proposal may be submitted by email, post, courier, or be hand delivered. It must be prominently with the RFQ number; HDQ-13-173. Proposals must be delivered no later than November 25, 2013 by 2:00 p.m. (Central Time). Proposals received after this date and time will be returned and will not be considered. If the bid is not submitted electronically, it shall consist of one hard copy and one electronic copy (DVD, CD or thumb drive). The proposal and shall be submitted to the Big Rivers Supply Chain department at the following addresses:

2.8.1. **Big Rivers Electric Corporation**
Attn: Rob Toerne
201 Third Street
PO Box 24
Henderson, KY 42419-0024

2.8.2. **Email: robert.toerne@bigrivers.com**

2.8.3. **Fax: 888-268-6219**

2.9. This inquiry implies no obligation on the part of Big Rivers. The Bidder offers the prices, terms, and delivery freely and without bias.

2.10. All expenses incurred by the Bidder in the development of this bid are the sole responsibility of the Bidder.

2.11. The evaluation methodology that will be used to identify the winning bid includes, but is not limited to the following four elements: the Non-Responsiveness Test, the Price Evaluation, Qualification/Certification Evaluation, and the Technical Evaluation. The purpose of each element and the process employed in each are described in the following sections.

2.11.1. Non-Responsiveness Evaluation: The Non-Responsiveness Evaluation is designed to identify and eliminate any proposal that has not provided the requested information in a proper format to allow an equitable evaluation to occur or that does not meet the requirements set forth in this RFQ. A bid deemed non-responsive by Big Rivers may be rejected. Bidders are subject to disqualification for such things as failure to submit the proposal on or before the designated time and date. Big Rivers Electric Corporation may, in its discretion, disqualify a bid and drop it from further consideration for failure to submit a complete proposal in the form required or failure to provide additional supporting documentation or any clarification that may be requested by Big Rivers subsequent to the submission of the proposal.

2.11.2. Price Evaluation: The Price Evaluation is designed to identify and eliminate bids which are clearly more expensive than other compliant proposals received. This will be accomplished by ranking the bids, as well as the designated options, against each other according to price. Preliminary estimates of production cost effects, operation and maintenance costs, and other pertinent costs will be made and added to each proposal for evaluation purposes. The evaluation will also include an estimate of the negative impact of deviations or exceptions, if any, to the terms and conditions in the proposed Contract or in other agreements contemplated to be entered into. Big Rivers expects the bid to contain an early payment discount structure which terms will also be part of the evaluation.

2.11.3. Qualification/Certification Evaluation: The Qualification/Certification Evaluation is designed to identify and eliminate bids that clearly demonstrate a lack of understanding or an inability to meet the intended Specification for this project. Big Rivers Electric Corporation requires all on-site contractors to complete the Contractor Certification process before any on-site work is

awarded. Therefore, a winning Bidder will, among other things, submit or confirm on file the completed and fully executed General Services Agreement, and safety rules, and will agree that all site workers will be in compliance with the CSCAP Program and any site specific safety requirements which will apply to all work.

2.11.4. Technical Evaluation: The Technical Evaluation will consist of a comprehensive review that considers a number of price and non-price factors. The goal of the Technical Evaluation is to determine the options that best meet the needs of Big Rivers for this project and technical options which improve the facility's overall cost, reliability and availability.

3. General Requirements

3.1. Upon award, all work will be governed by the terms and conditions set forth in the Specification and Bid Instructions, including, without limitation, the General Services Agreement (Appendix D).

3.2. The Contractor will, upon bid award, submit a Certificate of Insurance naming Big Rivers Electric Corporation as the holder of the certificate. The certificate will also show Big Rivers Electric Corporation as additional insured. Insurance coverage must meet as a minimum, the insurance requirements as specified in General Services Agreement.

3.3. Big Rivers is committed to procuring safe results for all Purchase Orders. The Contractor and every on-site employee must be certified through and current with Big Rivers' Contractor Safety Credentials Assessment Program (C-SCAP Program; Appendix H). Contractor will comply with all applicable OSHA, KOSHA, EPA, Big Rivers' rules or other safety practices, rules and regulations that govern work while on the Big Rivers' sites.

3.3.1. Big Rivers may stop work and/or remove the Contractor from the worksite which may lead to termination of this agreement by Big Rivers without further obligation to the Contractor, if the Contractor fails to observe safety requirements.

3.4. The Contractor will abide by the items in this Specification unless Big Rivers agrees in writing to any changes. Changes must be made in the form of a written request.

3.5. The criteria listed in this Specification should be used as a base line. Actual work required to perform this Specification may not be listed. It is expected that work required to access or reassemble specified work will be included as part of this Specification. The Specification entries may not be in chronological order or inclusive of all the job elements. It is the responsibility of the Contractor to realize and correct this.

4. Schedule Requirements

4.1. The Contractor may start as soon as a written notice to proceed is provided or upon issuance of a purchase order. All work must be completed within three weeks after award is made.

4.1.1. Contractor shall immediately notify the Owner's representative of any below-grade findings.

4.1.2. Contractor shall leave trenched areas open for up to 72 hours to allow the Owner an opportunity to survey any findings within the trench.

4.1.3. Contractor shall close the trenched areas upon Owner's authorization.

4.2. The time of completion of the Work is a basic consideration of the Specification. The proposal will be based upon completion of the Work during an allotted time window. Contractor's schedule and support requirements must be defined and submitted to the Big Rivers for approval. The approved schedule must be met.

4.2.1. The Contractor shall submit a final schedule showing the duration, milestones and major task just prior to start of work.

4.3. The Contractor will provide a weekly project status update to the designated Big Rivers representative.

4.4. The Contractor will adhere to the schedule. Any schedule provided within this Specification may be updated prior to the project; however task durations will remain constant. The Contractor will take any and all actions necessary to ensure scheduled completion.

4.5. The Contractor shall maintain, throughout the duration of the job, a schedule with the work progression of individual job elements. The schedule will be up-dated regularly and will be available to Big Rivers for review at any time. The schedule will be broken down to show individual job elements.

4.6. If at any time during the progress of the work it is determined that the scheduled completion date cannot be met, Big Rivers reserves the right to take any action it deems necessary to ensure timely completion.

5. Job Site Requirements

5.1. The Contractor will provide all necessary supervision, labor, job management, materials, tools, equipment and consumables deemed necessary to ensure safe, proper and timely completion of the specified work.

5.2. The Contractor's on-site employees will be in compliance with all C-SCAP requirements.

5.3. The Contractor will utilize all of the information presented in this document to be fully prepared to begin work at the specified commencement date and time. The Contractor will ensure that a copy of this document has been reviewed by and is in the possession of the on-site superintendent.

5.4. The Contractor will ensure that all instructions and emergency warnings can be effectively and immediately communicated to all employees. Unless otherwise

instructed Big Rivers requires that one (1) interpreter be provided for every eight (8) non-English speaking employees.

5.5. The Contractor will provide all necessary personnel protective equipment for each of its employees along with documentation of proper training in the use of said equipment.

5.6. The Contractor will protect its own employees and its Sub-contractors' employees and be responsible for their work until the Big Rivers' acceptance of the entire project, and to protect Big Rivers' facilities, property, employees and third parties from damage or injury.

5.7. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the Contractor.

5.8. The Contractor will inform Big Rivers of any hazardous chemicals that will be transported or used on the plant site. Material Safety Data Sheets (MSDS) must be provided to the Safety Training Coordinator prior to use on the plant site and must be available at all times while on the plant site.

5.9. The Contractor will comply with the latest or amended version of the followings standards and codes, and with any and all other standards and codes that may be applicable:

5.9.1. National Fire Protection Association (NFPA)
5.9.2. National Electrical Code (NEC)
5.9.3. National Electrical Manufacturers Association (NEMA)
5.9.4. Electrical Apparatus Service Association (EASA)
5.9.5. International Electrical Testing Association (NETA)
5.9.6. Factory Mutual (FM)

5.10. The Contractor will notify the designated Big Rivers representative upon completion of each phase of the work.

5.11. The Contractor will ensure that all discarded material and trash removed from the site or placed in an approved dumpster.

5.11.1. Big Rivers may provide on-site dumpsters for the disposal of non-hazardous waste material. Debris must not be stacked beyond the top of the dumpster.

5.12. The Contractor will not discharge petroleum products anywhere on the plant site. Fuel, lubrication products and any other liquid consumables stored on-site will be in an appropriate tank or container with proper labeling. Use of the proper container and the Big Rivers' approval of such containers in no way releases the Contractor from its responsibility to clean up any spills, discharges, or other releases.

5.13. During the project, unanticipated repairs or work may be encountered. If such needs are discovered during the project, they will be communicated to the designated Big Rivers representative by the Contractor's on-site supervisor as soon as possible.

5.13.1. The Contractor will obtain sufficient information to present a firm dollar quote for any emerging work for this project.

5.13.2. No additional work will be performed until the Contractor has been given written authorization to proceed by the Big Rivers.

5.14. The Contractor will exercise care in the protection of materials and equipment furnished under this Contract.

5.15. The Contractor will provide for the safety and protection of existing property. Any damage to existing facilities resulting from construction operations will be reported immediately to Big Rivers thereof and promptly repaired or replaced by the Contractor.

5.16. The Contractor will warrant to Big Rivers that all work will be in accordance with this Specification and will be free from defects in material and workmanship. Prompt notice of all defects will be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted by Big Rivers. If Contractor does not promptly comply, or in an emergency where delay would cause serious risk of loss or damage, Big Rivers may, upon written notice to the Contractor, have the defective work corrected or the rejected work removed and replaced, and all direct costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) will be paid by Contractor.

6. Site Supervision

6.1. The Contractor will designate an on-site contact person with the authority to make decisions, correct problems and generally oversee the Contractor's operations. In the event the contact person is absent from the job site, an alternate contact person with full will be available onsite during all activities relating to this project.

6.1.1. There will be a designated Big Rivers representative on site, during day shift, to coordinate work schedules, safety issues, etc.

6.2. The Contractor will provide in writing the name and phone number (office, home, pager and mobile as applicable) of the contact person and the alternate contact person(s) prior to the start of work hereunder and within one working day of any changes in the previously designated contact person.

6.3. To the extent possible, the on-site contact person will be the same from week to week to ensure job continuity.

6.4. The Contractor will provide after hours, emergency 24-hour per day contact list. The list will be prioritized as to the order that should be followed in notifying the Contractor.

7. Notices

7.1. Any notice, request, or approval or other document required or permitted to be given under this contract will be in writing unless otherwise provided herein and will be deemed to have been sufficiently given if delivered in person, transmitted by fax followed by a hard copy, dispatched in the U.S. mails, postage prepaid for mailing by certified or registered mail, return receipt requested, or dispatched for delivery by other courier service providing a return receipt, addressed as follows:

7.2. If to Big Rivers, addressed to:

Big Rivers Electric Corporation
P0 Box 24
Henderson, KY 42420
Attention: Procurement
Phone: 270-844-6173
Cell: 270-993-1576
Fax: 888-518-3410

7.3. If to Contractor, addressed to:

_____

_____

_____

_____

8.0 Engineer's Technical Specification

The requirements listed in this section, *8.0 Engineer's Technical Specification,* have been inserted directly from the Engineer's work product and is referenced by the Engineer as *Division 31 – Earthwork; Section 31233 – Pilot Trenching*.

DIVISION 31 – EARTHWORK

SECTION 312333 - PILOT TRENCHING

PART 1 - GENERAL

1.01 SUMMARY:

A. This Section includes:

1. Excavation, sheeting, bracing and all operations necessary for the preparation of trenches for uncovering existing below-grade utilities, foundations, and other obstructions by means of a water or air jet/vacuum-extraction system.
2. Dewatering of pilot trenches.
3. Backfilling and compaction of pilot trenches.

1.02 REFERENCES:

A. Applicable Standards:

1. American Society of Civil Engineers (ASCE):
   a. CI/ASCE 38-02 – Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.
2. American Society for Testing and Materials (ASTM) (Equivalent AASHTO standards may be substituted as approved):
   a. C33 - Concrete Aggregates.
   b. C88 - Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
   c. C94 - Ready-Mix Concrete.
   d. C144 - Aggregate for Masonry Mortar.
   e. C150 - Portland Cement.
   f. C173– Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   g. C231 – Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   h. C403 – Standard Test Method for the Time of Setting of Concrete Mixtures by Penetration Resistance.
   i. C618 - Coal Fly Ash and Raw or Natural Pozzolan for Use as a Mineral Admixture in Concrete.
   j. C939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
   k. C940 - Test Method for Expansion and Bleeding of Freshly Mixed Grouts for Preplaced-Aggregate Concrete in the Laboratory.
   l. D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
   m. D4832 - Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.
3. Occupational Safety and Health Administration (OSHA):

a. Part 1926 – Safety and Health Regulations for Construction.

1.03 SUBMITTALS:

A. Includes, but not limited to, the following:
   1. Proposed method for excavating pilot trenches.
   2. Dewatering plan.
   3. Proposed method and materials for backfill.
   4. Test results from laboratory testing of Controlled Low Strength Material (CLSM).
   5. Field notes.

1.04 QUALITY ASSURANCE:

A. Sampling and Testing:
   1. Tests to determine conformance with all requirements of this specification for quality and properties of all Contractor-secured materials, including borrow materials (both on or off site) proposed for use, shall be performed by an independent, commercial laboratory retained and compensated by Contractor, and approved by Owner.
   2. When incorporating materials into the project, quality control testing shall be performed during construction by a testing laboratory retained and compensated by Contractor.
   3. Copies of reports and certificates regarding tests and inspection of equipment, materials and completed Work shall be submitted. Furnish specific schedule for sampling to provide Owner with the opportunity to observe sampling.

1.05 PROJECT CONDITIONS:

A. Carefully maintain all benchmarks, monuments, and other reference points and repair or replace as directed by Owner if disturbed or destroyed.

B. Disposition of Utilities:
   1. Existing underground utilities are shown on Reference Drawings using the best information available at the time of Agreement preparation. Contractor shall identify, locate and protect all underground utilities that may be affected by the Work under this Agreement before starting excavation or other Site construction activities that could damage existing utilities.
   2. Adequately protect all active utilities from damage and exposure to elements.
   3. Coordinate with Owner and obtain required clearances prior to start of Work.
   4. Provide inspections required by public authorities.

PART 2 - PRODUCTS

2.01 MATERIALS ENCOUNTERED:

A. Suitable Materials: Materials suitable for use in fill include material that is free of debris, roots, organic matter, frozen matter, and which is free of stone having any dimension greater than 2 inches in areas requiring a high degree of compaction, or 4 inches in other fill areas:
   1. Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands generally exclusive of clayey and silty material with the following properties:
      a. Are free-draining.
      b. Impact compaction will not produce a well-defined moisture-density relationship curve.
      c. Maximum density by impact methods will generally be less than by vibratory methods.

d. Generally less than 15% by dry weight of soil particles pass a No. 200 square-mesh sieve.

2. Cohesive materials include materials made up predominately of silts and clays generally exclusive of sands and gravel with the following properties:
   a. Impact compaction will produce a well-defined, moisture-density relationship curve.
   b. Are not free draining.

B. Unsuitable Materials: Materials unsuitable for use in fill include all material that contains debris, roots, organic matter, frozen matter, shale particles, or material containing gravel or stone with any dimension greater than 2 inches in areas requiring a high degree of compaction or 4 inches in other embankment and fill areas, or other materials that are determined by Engineer as too wet or otherwise unsuitable for providing a stable subgrade or stable foundation for structures.

C. All Materials encountered, regardless of type, character composition and condition thereof, shall be considered "unclassified" for the purpose of payment.

2.02 CONTROLLED LOW-STRENGTH MATERIAL (CLSM OR FLOWABLE FILL):

1. Materials:
   a. Portland cement Type I or Type II conforming to ASTM C150.
   b. Fly ash conforming to ASTM C618 for Class C.
   c. Fine aggregate (sand) conforming to ASTM C33 or C144.
   d. Water, clean and potable, conforming to ASTM C94.
   e. Shrinkage compensator shall be proportioned in accordance with the manufacturer's recommendations, and as tested by ASTM C940.
   f. Admixtures for air entrainment or other purposes conforming to ASTM C173 or C231, or other appropriate standards referenced by manufacturer.
2. Mix Design:
   a. Submit details of the proposed mix design along with strength test results from an approved laboratory retained by Contractor. Commercial brand mixtures that have documented prior mix design strength history may be used with prior submittal of appropriate test results, mix design indicating conformance with these requirements, and approval by Engineer.
   b. Mix design shall permit adjustments in proportions of fine aggregate and/or water to achieve proper solid suspension and optimum flowability with approval of Engineer, and providing for the calculated yield to be maintained at one cubic yard for the given batch weights.
   c. Consistency of the mix shall be that of a batter, not thin and/or watery.
   d. Removable CLSM shall be used.
   e. Flowable fill (CLSM) shall exhibit the following physical properties:
      (1) Removable CLSM Mixes:
         (a) Minimum unconfined compressive strength of 75 psi at 28 days.
         (b) Maximum unconfined compressive strength of 150 psi at 28 days.
         (c) In place compressive strength of a maximum of 110% of design compressive strength after 1 year.
      (2) Provide for set-up within 12 hours.
      (3) Evaporation of bleed water shall not result in shrinkage of more than 1/8-inch per foot of flowable fill (CLSM) thickness.

PART 3 - EXECUTION

3.01 DEMOLITION:

A. Perform demolition work to protect existing facilities, structures, and property which are to remain, against damage from operations, falling debris, or other cause.

B. Isolate the work area with temporary fencing or partitions where required to protect existing facilities from noise or dirt and to provide for safe passage of persons around the area.

C. Take precautions to guard against movement or settlement, and provide shoring and bracing as necessary.

D. If at any time safety of existing structure to remain is endangered or any indication of soil or groundwater contamination is detected, cease operations, notify Engineer, and do not resume operations prior to approval.

3.02 TRENCHING:

A. General:

1. Contractor shall exercise extreme care using minimally intrusive methods when excavating to prevent personnel injury or damage to underground electrical utilities and piping. Hand excavate as required to locate below-grade existing work.
   a. Existing work shall include piping, electrical duct bank and conduit, and foundations.
   b. Acceptable excavation methods:
      (1) Hydraulic or air lance with removal of loosened soil by a vacuum unit.
      (2) Other excavation techniques may be used where approved by Engineer, provided that the Contractor is absolutely certain of effecting safe and acceptable excavation operations with regards to both the protection of below grade existing work and the safety of the excavation work crew and other on-site personnel.
   c. Repair any damage caused to existing utilities or grounding systems by pilot trenching operations.
   d. Limit maximum length of open trench to 200 feet.
2. Pilot Trench Limits
   a. Limits of pilot trenching shall be as indicated on Contract Drawings. Owner shall locate the pilot trench limits.
   b. Each exploratory excavation location shall be probed to a depth of 8 feet below existing grade, or to the depth required by Engineer.
   c. Each exploratory excavation location shall be probed using a trench width of at least 6 inches.
3. Identification and Documentation of Uncovered Utilities
   a. Contractor shall notify Owner once underground utilities have been encountered. Owner shall survey horizontal and vertical location of the encountered underground utility.
   b. Refer to CI/ASCE 38-02.
4. Provide temporary support for all utilities encountered in the excavation of the pilot trench until the pilot trench is backfilled. All trenching shall be constructed to meet OSHA requirements.
5. Owner must approve prior to backfilling pilot trench.

3.03 DEWATERING:

A. Dewatering:

1. Control grading around excavation to prevent surface water from flowing into excavated areas.

2. Drain or pump as required to continually maintain, including days not normally worked, all excavations and trenches free of water or mud from any source, and discharge to approved drains or channels. Commence when water first appears and continue as required to keep excavation free of standing water during entire time excavation is open.
3. Use pumps of adequate capacity to ensure rapid drainage of area, and construct and use drainage channels and subdrains with sumps as required.
4. When water is found in the excavation due to Contractor negligence, remove unsuitable excessively wet subgrade materials and replace with approved compacted fill materials as directed by Owner and at no additional cost to Owner.
5. Control, by acceptable means, all water regardless of source and be fully responsible for disposal of water.
6. Confine all discharge piping and/or ditches to available easement or to additional easement obtained by Contractor. Provide all necessary means for disposal of water, including the obtaining of all necessary permits and of additional easement at no additional cost to Owner.
7. Control groundwater in a manner that preserves strength of foundation soils, does not cause instability or raveling of excavation slopes, and does not result in damage to existing structures.
8. Open pumping with sumps and ditches shall be allowed, provided it does not result in boils, loss of fines, softening of the ground, or instability of slopes.
9. Install, operate, and maintain dewatering system required to control surface and/or groundwater.
10. Contractor shall be solely responsible for proper design, installation, operation, maintenance, and any failure of any component of system. Notice to Proceed issued by Engineer or submittal of dewatering plans and data by Contractor shall not relieve Contractor from full responsibility for errors therein or for complete and adequate design and performance of system in controlling water level in excavated areas and for control of hydrostatic pressures to depths specified.
11. Contractor shall be responsible for accuracy of drawings, design data, and operational records required by this Section.
12. Remove subgrade materials rendered unsuitable by excessive wetting and replace with approved backfill material at no additional cost to Owner.
13. Remove all dewatering equipment from Site, including related temporary electrical service.
14. Contractor shall submit a dewatering plan prior to beginning excavation.

3.04 BACKFILLING:

A. General:
1. Backfill pilot trenches as specified by Engineer and as directed by Owner.
2. Contractor shall obtain Owner approval before beginning any backfilling of pilot trenches.
3. All piping shall be backfilled with Owner-approved material.
4. Contractor shall exercise care in backfilling operations so that none of the located utilities are damaged. Repair any damage to existing utilities caused by backfilling operations.

B. Controlled Low-Strength Material (CLSM or Flowable Fill):
1. CLSM may be used for areas of backfill in lieu of compacted soil. The purpose of CLSM is to replace the compacted backfill in areas under or adjacent to utilities where compaction would be difficult and/or potentially detrimental to the utility. CLSM may be used in other instances when approved by Owner. This shall include, but not be limited to, the following uses:

a. For use instead of backfill under piping and conduits encountered but to remain in place. The CLSM shall be a minimum thickness of 8 inches below the utility and extend up to the springline of the utility. The width of the CLSM shall be approximately one diameter each side of the utility. Subgrade below the area to receive the fill concrete shall be compacted prior to the placement of the CLSM.
b. For use instead of backfill under electrical duct banks, partially undermined existing foundations, etc. The CLSM shall be a minimum thickness of 8 inches below the utility and extend up the side of the existing work at least 8 inches or higher if needed to develop sufficient head to ensure that the CLSM provides firm and 100% bearing under the existing work. The width of the CLSM shall be approximately 8 inches wider on the sides than the existing work. Subgrade below the area to receive the CLSM shall be compacted prior to the placement of the CLSM.
c. For use as general backfill, when approved by the Owner, during cold weather conditions when suitable unfrozen soil is not readily available.

2. Place CLSM by means of chute, drop pipe, pump, bucket, or other method approved by Engineer to maintain consistency, flowability, and strength of in-place final product. Fill all voids and place to final elevation without use of a vibrator.
3. Open ends of area to be backfilled shall be plugged or built-up with a temporary bulkhead arrangement to prevent loss of CLSM during placement or during curing.
4. CLSM is intended for placement within a hole that is dry or maintained with a positive dewatering operation. If it is necessary to place CLSM under water, method for placement and mix design shall be submitted to Engineer for approval at least 10 working days prior to any intended pours.
5. Monitor surface elevation of placed CLSM and document any shrinkage or settlement of initial placement volume. Provide information of shrinkage and/or settlement of initial lift to Engineer prior to placement of any additional layers or completion of CLSM placement to final elevation.
6. CLSM shall not be covered with soil or other imposed loading until a minimum compressive strength of 30 psi is attained or until a minimum of 12 hours' cure time has elapsed. Minimum strengths shall be demonstrated by failure to deform or crush the fill with an equivalent 30 psi applied loading in the field.
7. Protect CLSM from freezing while curing with insulated blankets or other Engineer approved methods.

3.05 WASTE MATERIALS AND DEBRIS:

A. Waste Materials:
1. Waste materials include all excess suitable materials and materials unsuitable for use in the Work.
2. Remove unsuitable materials from work area as excavated.
3. Keep excess suitable material segregated from unsuitable waste in the waste disposal area.
4. Provide equipment necessary to spread waste materials at disposal area and as necessary to maintain access to disposal area.
5. Grade waste areas and leave free-draining with an orderly, neat appearance. Side slopes shall not be steeper than 3 horizontal to 1 vertical.
6. Dispose of waste material as indicated or directed by Owner.

B. Debris:
1. Dispose of debris from demolition at a Owner designated location on the plant site.
2. Combustible waste material and debris shall not be burned.

3.06 FIELD QUALITY CONTROL:

A. Controlled Low-Strength Material (CLSM):

1. Determine unconfined compressive strength using cylinders of CLSM sampled, handled, cured, and tested in accordance with ASTM D4832. Perform a minimum of one set of four cylinders for every 100 cubic yards of CLSM placed but not less than one set for each day's placement, unless otherwise directed by Owner.
2. Determine bearing strength, if required by Engineer, using penetration testing in accordance with ASTM C403.
3. Test flow of CLSM, if required by Engineer, in accordance with ASTM C939.

3.07 DRAWING LIST:

CJ001 - Big Rivers Robert D. Green MATS Compliance Project Trenching Plan

END OF SECTION 312333

9. Definitions

9.1. "Addenda" - written or graphic changes or interpretations of the Contract Documents issued by Owner prior to the opening of Bids.

9.2. "Administrator" shall mean the Administrator of the Rural Utilities Service of the United States of America and his or her duly authorized representative or any other person in whom or authority in which may be vested the duties and functions which the Administrator is now authorized by law to perform.

9.3. "Application for Payment" - the form acceptable to Owner and Engineer which is to be used by Bidder during the course of the Work in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

9.4. "Bid" - the formal offer of the Bidder submitted on the prescribed Bid Form and all information submitted with the Bid that pertains to performance of the Work.

9.5. "Bidder" – Prior to Contract award, "Bidder" is any person, firm, or corporation submitting a Bid for the Work or their duly authorized representative. Upon contract award, "Bidder" is the person, firm or corporation with whom the Owner has entered into the Contract.

9.6. "Change Order" - a written document recommended by Engineer which is signed by Owner and Bidder and authorizes an addition, deletion, or revision in the Work, or an adjustment in the Contract Price or the Contract Time or other material provision issued on or after execution of the Contract.

9.7. "Contract" - the written agreement between Owner and Bidder covering the Work to be performed. Other Contract Documents are attached to the Contract and made a part thereof as provided therein.

9.8. "Contract Documents" - RUS Form 198 or RUS Form 200, all documents referenced in the table of contents, Exhibits, Attachments, affidavits, bonds, insurance requirements and documents, releases, Specifications, drawings, and Change Orders or signed amendments issued to the Contract.

9.9. "Contract Time" - the number of days or the dates stated in the Contract Documents for the completion of the Work.

9.10. "Date of Contract" - the date on which the Contract is signed and executed by the Owner.

9.11. "Day" or "Days" - a calendar day of 24 hours measured from midnight to the next midnight shall constitute a day.

9.12. "DDP" (Delivered Duties Paid) (Incoterms 2000) Point of Delivery - The Contract Price includes all costs of transporting Equipment and Materials to the named Point of Delivery, including but not limited to any duties, permits, and insurance for the full value of the Equipment and Materials being delivered.

9.13. "Defective" - an adjective which when modifying the words Equipment and Materials, or Field Services refers to Equipment and Materials or Field Services which do not conform to the Contract Documents, or do not meet the requirements of any inspection reference standard, test, or approval referred to in the Contract Documents.

9.14. "Effective Date of the Contract" – the date of acceptance of Contract by Owner which may be in the form of a dated purchase order.

9.15. "Engineer" shall mean the Engineer employed by the Owner, to provide engineering services for the project and said Engineer's duly authorized assistants and representatives. For this Project, "Engineer" means Burns & McDonnell Engineering Company, Inc. a Missouri Corporation, with offices at 9400 Ward Parkway, Kansas City, Missouri 64114.

9.16. "Equipment" - a product with operational or nonoperational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

9.17. "Field Services" - services to be furnished by Contractor at the Site as required by the Contract Documents.

9.18. "Final Acceptance" - the Work has progressed to the point where, in the opinion of Owner and Engineer, it is sufficiently complete, in accordance with the Contract Documents.

9.19. "Laws and Regulations," "Laws or Regulations" - laws, rules, regulations, ordinances, codes and/or orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

9.20. "Materials" - products substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed to form a part of the Work.

9.21. "Notice to Proceed" - the written notice by Owner to Bidder fixing the date on which the Contract Times will commence to run and on which Bidder shall start to perform Bidder's obligation under the Contract.

9.22. "Owner" – Big River Electric Corporation, also referred to as "BREC", Big "Rivers", or "Company".

9.23. "Point of Delivery" – the place designated where the Equipment and Materials are to be delivered:

9.23.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

9.24. "Parties" - Owner and Bidder, each of which is individually a "Party".

9.25. "Payment and Cancellation Schedule" - the detailed listing of activities or milestones with an associated payment percentage of the total Contract Price which accurately reflects payment for Work accomplished and cancellation percentage of the total Contract Price which reflects the payment(s) agreed to between the Parties in the

event of cancellation. This schedule shall be jointly developed and agreed to by Owner and Contractor.

9.26. "Project" - the total construction of which the Work to be provided under the Contract may be the whole, or a part as indicated elsewhere in the Contract.

9.27. Reference Drawings" - drawings not specifically prepared for this Contract, but which contain information pertinent to the Work.

9.28. "Samples" - physical examples of Equipment, Materials, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

9.29. "Shop Drawings" - all drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

9.30. "Site", "Job Site" or "Point of Delivery" - the Owner's Station where Equipment is being delivered or services are to be performed:

9.30.1. Big Rivers Electric Corporation, Green Station, 9000 HWY 2096, Robards, KY 42452.

9.31. "Specifications" - those portions of the Contract Documents consisting of written descriptions of the Work, and covering the Equipment, Materials, workmanship, performance and certain administrative details applicable thereto.

9.32. "Subcontractor" - an individual, firm, or corporation having a direct contract with Contractor to perform a portion of the Work.

9.33. "Submittals" - all Shop Drawings, product data, and Samples which are prepared by Contractor, a Subcontractor, manufacturer or Supplier, and submitted by Contractor to Owner and Engineer as a basis for approval of the use of Equipment and Materials proposed for incorporation in the Work or needed to describe proper installation, operation, and maintenance, or technical properties.

9.34. "Substantial Completion" - the event when, as determined in Owner's reasonably exercised discretion, (i) erection or installation of the Equipment and Materials furnished under the Contract has been completed by the installing contractor and required Field Services have been furnished, (ii) the Equipment and Materials are operating safely for the purpose of commissioning and startup, (iii) all testing of the Work has been completed and all test data properly evaluated, (iv) the performance guarantees have been verified by Owner and Engineer and the warranty period has commenced, and (v) Contractor has delivered to Company all operating instructions, maintenance manuals, and warranties.

9.35. "Supplier" - a manufacturer, fabricator, supplier, distributor, material man, or vendor of Bidder.

9.36. "Work" - the goods and all services required by the Contract, and includes all labor, Materials, Equipment and services provided or to be provided by the Contractor to

fulfill the Contractor's obligations herein. The Work may constitute the whole or a part of the Project.

9.37. "Force Majeure" - any condition, event or circumstance, including the examples set forth below, but only if, and to the extent (i) such condition, event or circumstance is not within the reasonable control of the Party affected, (ii) such condition, event or circumstance, despite the exercise of reasonable diligence, cannot be prevented, avoided or removed by such Party, (iii) such condition, event or circumstance materially adversely affects the ability of the affected Party to fulfill its obligations under this Agreement, (iv) the affected Party has taken all commercially reasonable precautions, due care and commercially reasonable alternative measures in order to avoid the effect of such condition, event or circumstance on the affected Party's ability to fulfill its obligations under this Agreement and to mitigate the consequences thereof and (v) such condition, event or circumstance is not the result of any failure of such Party to perform any of its obligations under this Agreement. By way of example, such events, conditions and circumstances shall include war, rebellion, sabotage, riots, insurrection, public disorder, fires, floods, volcanic eruption, tidal wave, earthquake, quarantine, explosions or other natural catastrophes or Acts of God, and changes in Applicable Laws after the Effective Date of the Contract.

APPENDIX A

Big Rivers Electric Corporation
Submittal Form
RFQ #HDQ-13-173

PROPOSAL

The Bidder agrees to perform the all work described in this specification and other attached documents for the following firm lump sum price:

Labor	$
Equipment	$
Materials	$
Total Price	**$**

☐ **TIME AND MATERIALS RATE SHEET ATTACHED**

☐ **ADDENDA ACCEPTANCE** (ATTACHED)

☐ NOT APPLICABLE

☐ **EXCEPTIONS & CLARIFICATIONS** (ATTACHED)

☐ NOT APPLICABLE

Included	Previously Submitted	
☐	☐	**General Services Agreement**
☐	☐	**Contractor Safety Credentials Assessment Program Forms**
☐	☐	**Equal Opportunity, Debarment, & Lobbying Forms**
☐	☐	**Vendor Information & W-9 Forms**

Company Name _____ Printed Name _____ Signature _____ Date _____

APPENDIX B

BID CLARIFICATIONS AND/OR EXCEPTIONS

Bidder offers the following clarifications and/or exceptions taken to any requirement or provision of this Request For Quotation and any proposed modifications or replacement language for each clarification or exception (If none, so state)

Bidder understands that unless itemized above, no other clarifications or exceptions to this Request for Quotation are taken by the Bidder.

_____

Bidder

_____

Signature of Executing Party

_____

Date

APPENDIX C

Big Rivers Electric Corporation
GENERAL SERVICES AGREEMENT

This General Services Agreement (this "General Services Agreement") is made this ___ day of _____, 20___ by and between Big Rivers Electric Corporation ("Company") and _____ ("Contractor"), a _____ (list state of entity's organization and entity type, such as "Kentucky corporation" or "Kentucky limited liability company", etc.).

WHEREAS, Contractor desires the opportunity to provide goods and/or services to Big Rivers Electric Corporation from time to time, and Big Rivers Electric Corporation desire the opportunity to engage Contractor to provide such goods and/or services; and

WHEREAS, the parties intend that this General Services Agreement sets forth the exclusive set of terms and conditions which shall govern the performance of the "Work" (as defined below) by Contractor for the Company should the Company engage Contractor to provide Work.

NOW THEREFORE, in consideration of the premises, the mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties do agree as follows:

ARTICLE 1 DEFINITIONS

1.01 **1.02 Agreement:** "Agreement" shall mean this General Services Agreement, along with any "Specifications, (as defined below) and/or Purchase Order (as defined below) issued by Company and/or ", , etc any other documentation as may be executed by the parties in accordance with Article 2, and/or other agreed collateral document pursuant to which the Work is to be performed.

1.03 **Applicable Laws:** "Applicable Laws" shall mean any and all applicable federal, state, or local laws, regulations, codes, ordinances, administrative rules, court orders, permits or executive orders.

1.04 **Contract Price:** "Contract Price" shall mean the aggregate of the particular consideration set forth in one or more Purchase Orders or other Statements of Work or as otherwise agreed upon. Unless otherwise agreed in writing, the Contract Price includes all applicable taxes, duties, fees, and assessments of any nature, including without limitation all sales and use taxes, due to any governmental authority with respect to the Work.

1.05 **Contractor:** "Contractor" shall mean the entity designated as the "Contractor" in the opening paragraph of this Agreement.

1.06 **Company:** "Company" shall mean Big Rivers Electric Corporation

1.07 **Purchase Order:** Company may, at its discretion, issue its own "Purchase Order Standard Terms and Conditions" (collectively referred to as a "Purchase Order") that may supplement, but in no way or manner ever supersede, this Agreement with respect to any conflicting terms and conditions.

1.09 **Specifications:** "Specifications" shall mean any specifications, instructions, drawings, schedules, a Purchase Order, contracts, scopes of work, and/or statements of work.

1.10 **Work:** "Work" shall include those services and/or goods set forth in this Agreement.

1.11 **Tools and Equipment:** "Tools and Equipment" shall mean any tools, equipment, rigging and other general supplies on the Company's premises where the Work is being performed that is either owned and/or leased by Company or by any of its Affiliates.

ARTICLE 2 SCOPE; BINDING EFFECT

Unless otherwise agreed in a writing executed by each of the parties which evidences a clear intention to supersede this Agreement, the parties intend that this Agreement apply to all transactions which may occur between the Company on one hand and Contractor on the other hand during the term of this Agreement and which are related to the provision of goods and/or services by Contractor for the benefit of the Company. Neither the Company makes any commitment to Contractor as to the exclusiveness of this relationship or as to the volume, if any, of business the Company will do with Contractor. The parties do, however, anticipate that the parties will agree from time to time for the performance of Work by Contractor. Such agreement for the provision of Work shall be reflected by (a) each of the parties executing a mutually acceptable Statement of Work under this Agreement or (b) Company providing a Purchase Order or other Statement of Work to Contractor and Contractor accepting such Purchase Order or other Statement of Work (including by commencing performance pursuant to such Purchase Order or other Statement of Work). In the event Company provides a Purchase Order or other Statement of Work to Contractor and Contractor commences performance, unless such Purchase Order or other Statement of Work expressly provides otherwise, Contractor hereby agrees to the formation of a binding agreement as described in the Purchase Order or other Statement of Work upon Contractor's commencement of performance, waives any argument that it might otherwise have under Applicable Laws that the Purchase Order should have been executed by each of the parties to be enforceable and further agrees to not contest the enforceability of such Purchase Order or other Statement of Work on those grounds, and agrees to not contest the admissibility of Company's records related to such Purchase Order or other Statement of Work that are kept in the ordinary course by Company. In addition, in no event shall the terms and conditions of any proposal, Purchase Order or other Statement of Work, acknowledgement, invoice, or other document unilaterally issued by Contractor be binding upon Company without Company's explicit written acceptance thereof. Any Work performed by Contractor without Company's binding commitment for such Work either via a duly executed or accepted Purchase Order or other Statement of Work under this Agreement shall be at Contractor's sole risk and expense, and Company shall have no obligation to pay for any such Work.

ARTICLE 3 CONDITIONS AND RISKS OF WORK; LABOR HARMONY

Unless the applicable Statement of Work expressly provides otherwise, Contractor agrees that before beginning any Work Contractor shall carefully examine all conditions relevant to such Work and its surroundings, and, unless Contractor notifies Company in writing that it will not perform the Work under such conditions, Contractor shall assume the risk of such conditions and shall, regardless of such conditions, the expense, or difficulty of performing the Work, fully complete the Work for the stated Contract Price applicable to such Work without further recourse to Company. Without limiting the foregoing, Contractor specifically recognizes that Company and other parties may be working concurrently at the site. Information on the site of the Work and local conditions at such site furnished by Company in specifications, drawings, or otherwise is made without representation or warranty of any nature by Company, is not guaranteed by Company, and is furnished solely for the convenience of Contractor. All drawings and other documents, if any, required to be submitted to Company for review shall be submitted in accordance with the mutually agreed to schedule, and, if no schedule applies, such drawings or other documents shall be submitted by Contractor without unreasonable delay. No Work affected by such drawings and other documents shall be started until Contractor is authorized to do so by Company. In case of a conflict between or within instructions, specifications, drawings, schedules, Purchase Order(s) and/or other Statements of Work, Company shall resolve such conflict; and Company's resolution shall be binding on Contractor. Contractor agrees that all labor employed by Contractor, its agents, or subcontractors for Work on the premises of Company shall be in harmony with all other labor being used by Company or other contractors working on Company's premises. Contractor agrees to give Company immediate notice of any threatened or actual labor dispute and will provide assistance as determined necessary by Company to resolve any such dispute. Contractor, its agents, or subcontractors shall remove from Company's premises any person objected to by Company in association with the Work.

ARTICLE 4 COMPANY CHANGES IN WORK

The scope of and conditions applicable to the Work shall be subject to changes by Company from time to time. Such changes shall only be enforceable if documented in a writing executed by Company. Except as

otherwise specifically set forth in this Agreement, changes in the scope of or conditions applicable to the Work may result in adjustments in the Contract Price and/or the Work schedule in accordance with this Article 4. If Contractor believes that adjustment of the Contract Price or the Work schedule is justified, whether as a result of a change made pursuant to this Article or as a result of any other circumstance, then Contractor shall (a) give Company written notice of its claim within five (5) business days after receipt of notice of such change or the occurrence of such circumstances and (b) shall supply a written statement supporting Contractor's claim within ten (10) business days after receipt of notice of such change or occurrence of such circumstances, which statement shall include Contractor's detailed estimate of the effect on the Contract Price and/or the Work schedule. Contractor agrees to continue performance of the Work during the time any claim hereunder is pending. Company shall not be bound to any adjustments in the Contract Price or the Work schedule unless expressly agreed to by Company in writing. Company will not be liable for, and Contractor waives, any claims of Contractor that Contractor knew or should have known and that were not reported by Contractor in accordance with the provisions of this Article.

ARTICLE 5 FORCE MAJEURE

Neither party shall be liable to the other for any damages for any failure to perform or for any delays or interruptions beyond that party's reasonable control in performing any of its obligations under this Agreement due to acts of God, fires, floods, earthquakes, riots, war, acts of terrorism, civil insurrection, acts of the public enemy, or acts or failures to act of civil or military authority, unless the time to perform is expressly guaranteed. Contractor shall advise Company immediately of any anticipated and actual failure, delay, or interruption and the cause and estimated duration of such event. Any such failure, delay, or interruption, even though existing on the date of this Agreement or on the date of the start of the Work, shall require Contractor to within five (5) days submit a recovery plan detailing the manner in which the failure, delay, or interruption shall be remedied and the revised schedule. Contractor shall diligently proceed with the Work notwithstanding the occurrence thereof. This Article shall apply only to the part of the Work directly affected by the particular failure, delay, or interruption, and shall not apply to the Work as a whole or any other unaffected part thereof.

ARTICLE 6 CONTRACTOR DELAYS

Time is an important and material consideration in the performance of this Agreement by Contractor. Contractor agrees to cooperate with Company in scheduling the Work so that the project and other activities at Company's site will progress with a minimum of delays. Company shall not be responsible for compensating Contractor for any costs of overtime or other premium time work unless Company has provided separate prior written authorization for additional compensation to Contractor, and, if Company provides such written authorization, such additional compensation shall be limited to Contractor's actual cost of the premium portion of wages, craft fringe benefits, and payroll burdens. Contractor shall be liable for all failures, delays, and interruptions in performing any of its obligations under this Agreement which are not (a) caused by Company and reported in accordance with Article 4, (b) excused by Article 5, or (c) directed by Company pursuant to Article 7. Contractor shall, without adjustment to completion date or Contract Price, be obligated to make up time lost by such failures, delays, or interruptions. Company may suspend payments under this Agreement during the period of any such failure, delay, or interruption.

ARTICLE 7 COMPANY EXTENSIONS

Company shall have the right to extend schedules or suspend the Work, in whole or in part, at any time upon written notice to Contractor (except that in an emergency or in the event that Company identifies any safety concerns, Company may require an immediate suspension upon oral or written notice to Contractor). Contractor shall, upon receipt of such notice, immediately suspend or delay the Work. Contractor shall resume any suspended Work when directed by Company. If Contractor follows the requirements of Article 4, a mutually agreed equitable adjustment to the Contract Price or to the schedules for payments and performance of the remaining Work may be made to reflect Company's extension of schedules or suspension of the Work. Contractor shall provide Company all information Company shall request in connection with determining the amount of such equitable adjustment.

ARTICLE 8 INSPECTING, TESTING, AUDITING, AND USE OF TOOLS AND EQUIPMENT;

8.01 Right of Inspecting and Testing: Company reserves the right, but shall not be obligated, to appoint representatives to follow the progress of the Work with authority to suspend any Work not in compliance with this Agreement. The appointment or absence of an appointment, of such representatives by Company shall not have any effect on warranties. Acceptance or approval by Company's representative shall not be deemed to constitute final acceptance by Company, nor shall Company's inspection relieve Contractor of responsibility for proper performance of the Work. Inspection by Company's representative shall not be deemed to be supervision or direction by Company of Contractor, its agents, servants, or employees, but shall be only for the purpose of attempting to ensure that the Work complies with this Agreement. In the event Contractor fails to provide Company with reasonable facilities and access for inspection when advised, and if in the opinion of Company it becomes necessary to dismantle the Work for such inspection, then Contractor shall bear the expenses of such dismantling and reassembly.

8.02 Right of Auditing: Contractor shall maintain complete records relating to any cost-based (i.e., Work not covered by firm prices) components of the Work billed under this Agreement or relating to the quantity of units billed under any unit price provisions of this Agreement (all the foregoing hereinafter referred to as "Records") for a minimum of five years following the latest of performance of, delivery to Company of, or payment by Company for, such Work or units. All such Records shall be open to inspection and subject to audit and reproduction during normal working hours, by Company or its authorized representatives to the extent necessary to adequately permit evaluation and verification of any invoices, payments, time sheets, or claims based on Contractor's actual costs incurred in the performance or delivery of Work under this Agreement. For the purpose of evaluating or verifying such actual or claimed costs, Company or its authorized representative shall have access to said Records at any time, including any time after final payment by Company to Contractor pursuant to this Agreement. All non-public information obtained in the course of such audits shall be held in confidence except pursuant to judicial and administrative order. Company or its authorized representative shall have access, during normal working hours, to all necessary Contractor facilities and shall be provided adequate and appropriate work space to conduct audits in compliance with the provisions of this Article. Company shall give Contractor reasonable notice of intended audits. The rights of Company set forth in this paragraph shall survive the termination or expiration of this Agreement.

8.03 Use of Tools and Equipment: Company, in its sole discretion, may allow Contractor to use Company's Tools and Equipment for the Work and related activities at designated Company locations. Contractor shall indemnify and hold harmless Company and its Affiliates, including their respective officers, directors, shareholders, agents, members and employees (each an "Indemnified Party"), from and against any and all claims, damages, losses or liabilities arising out of, relating to, or in connection with, the use of Company's Tools and Equipment by Contractor, its agents, servants, employees or subcontractors, and will reimburse each Indemnified Party for all expenses (including attorney's fees and expenses) as they are incurred in connection with investigating, preparing or pursuing or defending any action, claim, suit or investigation or proceeding related to, arising out of, or in connection with, the use of Company's Tools and Equipment by Contractor, its agents, servants, employees or subcontractors, whether or not threatened or pending and whether or not any Indemnified Party is a party. Contractor, on behalf of itself or its agents, affiliates, officers and directors, and all of their predecessors, successors, assigns, heirs, executors and administrators, hereby irrevocably release, discharge, waive, relinquish and covenant not to sue, directly, derivatively or otherwise, Company and/or its Affiliates and each of their respective directors, officers, shareholders, members, partners (general or limited), employees and agents (including, without limitation, its financial advisors, counsel, proxy solicitors, information agents, depositories, consultants and public relations representatives) and all of their predecessors, successors, assigns, heirs, executors or administrators, and all persons acting in concert with any such person , with respect to any and all matters, actions causes of action (whether actually asserted or not), suits, damages, claims, or liabilities whatsoever, at law, equity or otherwise, arising out of, relating to, or in connection with the use of Company's Tools and Equipment by Contractor, its agents, servants, employees or subcontractors. Company shall in no event be liable for any claim whatsoever by or through Contractor, its employees, agents and/or subcontractors or by any third

party, for any inoperability or failure of the Tools and Equipment to perform as designed or intended, whether such claim is based in warranty, contract, tort (including negligence), strict liability or otherwise and whether for direct, incidental, consequential, special, exemplary or other damages. Contractor shall ensure that its employees, agents, subcontractors or servants shall inspect, exercise the appropriate level of care in the use, maintenance and repair of the Tools and Equipment, so as to minimize the incidence of casualties and injuries occurring in connection therewith.

ARTICLE 9 COMPLIANCE WITH APPLICABLE LAWS; SAFETY; DRUG AND ALCOHOL TESTING

9.01 Applicable Laws and Safety: Contractor agrees to protect its own and its subcontractors' employees and be responsible for their Work until Company's acceptance of the entire project and to protect Company's facilities, property, employees, and third parties from damage or injury. Contractor shall at all times be solely responsible for complying with all Applicable Laws and facility rules, including without limitation those relating to health and safety, in connection with the Work and for obtaining (but only as approved by Company) all permits and approvals necessary to perform the Work. Without limiting the foregoing, Contractor agrees to strictly abide by and observe all standards of the Occupational Safety & Health Administration (OSHA) which are applicable to the Work being performed now or in the future, as well as Company's Contractor Code of Business Conduct and Company's Contractor/Subcontractor Safety Policy which are both hereby incorporated by reference (Contractor hereby acknowledges receipt of a copy of such Company's Contractor Code of Business Conduct and Company's Contractor/Subcontractor Safety Policy) and any other rules and regulations of the Company, all of which are incorporated herein by reference. Contractor also agrees to be bound to any amendments and/or modifications that may be issued in the future by Company from time to time, with respect to Company's Contractor Code of Business Conduct and/or any of its related policies which are the subject of this Article 9. Contractor shall maintain the Work site in a safe and orderly condition at all times. Company shall have the right but not the obligation to review Contractor's compliance with safety and cleanup measures. In the event Contractor fails to keep the work area clean, Company shall have the right to perform such cleanup on behalf of, at the risk of and at the expense of Contractor. In the event Contractor subcontracts any of the Work, Contractor shall notify Company in writing of the identity of the subcontractor before utilizing the subcontractor. Contractor shall require all of its subcontractors to complete the safety and health questionnaire and checklists provided by Company and shall provide a copy of such documents to Company upon request. Contractor shall conduct, and require its subcontractors to conduct, safety audits and job briefings during performance of the Work. In the event a subcontractor has no procedure for conducting safety audits and job briefings, Contractor shall include the subcontractor in its safety audits and job briefings. All safety audits shall be documented in writing by the Contractor and its subcontractors. Contractor shall provide documentation of any and all audits identifying safety deficiencies and concerns and corrective action taken as a result of such audits to Company semi-monthly.

9.02 Hazards and Training: Contractor shall furnish adequate numbers of trained, qualified, and experienced personnel and appropriate safety and other equipment in first-class condition, suitable for performance of the Work. Such personnel shall be skilled and properly trained to perform the Work and recognize all hazards associated with the Work. Without limiting the foregoing, Contractor shall participate in any safety orientation or other of Company's familiarization initiatives related to safety and shall strictly comply with any monitoring initiatives as determined by Company. Contractor shall accept all equipment, structures, and property of Company as found and acknowledges it has inspected the property, has determined the hazards incident to working thereon or thereabouts, and has adopted suitable precautions and methods for the protection and safety of its employees and the property.

9.03 Drug and Alcohol: No person will perform any of the Work while under the influence of drugs or alcohol. No alcohol may be consumed within four (4) hours of the start of any person's performance of the Work or anytime during the workday. A person will be deemed under the influence of alcohol if a level of .02 percent blood alcohol or greater is found. In addition to the requirements of the drug testing program, as set forth in Company's rules and regulations, all persons who will perform any of the Work will be subject to drug and alcohol testing under either of the following circumstances: (i) where the person's performance either contributed to an accident or cannot be completely discounted as a contributing factor to an accident

which involves off-site medical treatment of any person; and (ii) where Company determines in its sole discretion that there is reasonable cause to believe such person is using drugs or alcohol or may otherwise be unfit for duty. Such persons will not be permitted to perform any Work until the test results are established. Contractor shall be solely responsible for administering and conducting drug and alcohol testing, as set forth herein, at Contractor's sole expense. As applicable and in addition to any other requirements under this Agreement, Contractor shall develop and strictly comply with any and all drug testing requirements as required by Applicable Laws.

9.04 Office of Compliance: The Company has an Office of Compliance. Should Contractor have actual knowledge of violations of any of the herein stated policies of conduct in this Article 9, or have a reasonable basis to believe that such violations will occur in the future, whether by its own employees, agents, representatives or subcontractors, or by another vendor and/or supplier of the Company and its employees, agents, representatives or subcontractors, or by any employee, agent and/or representative of Company, Contractor has an affirmative obligation to immediately report any such known, perceived and/or anticipated violations to the Company's Office.

ARTICLE 10 STATUS OF CONTRACTOR

Company does not reserve any right to control the methods or manner of performance of the Work by Contractor. Contractor, in performing the Work, shall not act as an agent or employee of Company, but shall be and act as an independent contractor and shall be free to perform the Work by such methods and in such manner as Contractor may choose, doing everything necessary to perform such Work properly and safely and having supervision over and responsibility for the safety and actions of its employees and the suitability of its equipment. Contractor's employees and subcontractors shall not be deemed to be employees of Company. Contractor agrees that if any portion of Contractor's Work is subcontracted, all such subcontractors shall be bound by and observe the conditions of this Agreement to the same extent as required of Contractor. In such event, Company strongly encourages the use of Minority Business Enterprises, Women Business Enterprises, and Disadvantaged Business Enterprises, as defined under federal law and as certified by a certifying agency that Company recognizes as proper.

ARTICLE 11 EQUAL EMPLOYMENT OPPORTUNITY

To the extent applicable, Contractor shall comply with all of the following provisions, which are incorporated herein by reference: (i) Equal Opportunity regulations set forth in 41 CFR § 60-1.4(a) and (c), prohibiting employment discrimination against any employee or applicant because of race, color, religion, sex, or national origin; (ii) Vietnam Era Veterans Readjustment Assistance Act regulations set forth in 41 CFR § 60-250.4 relating to the employment and advancement of disabled veterans and Vietnam era veterans; (iii) Rehabilitation Act regulations set forth in 41 CFR § 60-741.4 relating to the employment and advancement of qualified disabled employees and applicants for employment; (iv) the clause known as "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals" set forth in 15 USC § 637(d)(3); and (v) the subcontracting plan requirement set forth in 15 USC § 637(d).

ARTICLE 12 INDEMNITY BY CONTRACTOR

12.01 Indemnity: Contractor shall be responsible for and shall defend, indemnify, and save harmless Big Rivers Electric Corporation from any and all damage, loss, claim, demand, suit, liability, fine, penalty, or forfeiture of every kind and nature, including, but not limited to, costs and expenses, including professional fees and court costs of defending against the same and payment of any settlement or judgment therefore, by reason of:

(1) injuries or deaths to persons,
(2) damages to or destruction of real, personal, or intangible properties,
(3) violations of any other rights asserted against Big Rivers Electric Corporation, including patents, trademarks, trade names, copyrights, contract rights, and easements, or
(4) violations of governmental laws, regulations or orders whether suffered directly by Big Rivers Electric Corporation itself, or indirectly by reason of claims, demands or suits against it, resulting or alleged to have resulted from acts or omissions of Contractor, its employees,

agents, business invitees, or other representatives or from their presence on the premises of Big Rivers Electric Corporation, either solely or in occurrence with any alleged joint negligence of Big Rivers Electric Corporation.

Big Rivers Electric Corporation shall be liable for its sole negligence and to the extent of its concurrent negligence. Indemnification of Big Rivers Electric Corporation includes its officers, employees, and agents.

ARTICLE 13 ENVIRONMENTAL

13.01 Control: As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200) and certain other Applicable Laws, Contractor or its subcontractors shall provide Material Safety Data Sheets ("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Agreement. Contractor and its subcontractors shall provide Company with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any Applicable Laws in effect at the worksite. **No asbestos or lead containing materials shall be incorporated into any Work performed by Contractor or otherwise left on the Work site without the prior written approval of Company.** Contractor and its subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Agreement is subject to any Applicable Laws.

13.02 Labeling: Contractor and its subcontractors shall label hazardous substances and materials and train their employees in the safe usage and handling of such substances and materials as required under any Applicable Laws.

13.03 Releases: Contractor and its subcontractors shall be solely responsible for the management of any petroleum or hazardous substances and materials brought onto the Work site and shall prevent the release of petroleum or hazardous substances and materials into the environment. All petroleum or hazardous substances and materials shall be handled and stored according to Contractor's written Spill Prevention Control and Countermeasures Plan or Best Management Practices Plan as defined under the provisions of the Clean Water Act, as amended, if either such Plan must be maintained pursuant to Applicable Laws. Contractor shall provide secondary containment for the storage of petroleum or hazardous substances and materials. The prompt and proper clean-up of any spills, leaks, or other releases of petroleum or hazardous substances and materials resulting from the performance of the Work under this Agreement and the proper disposal of any residues shall be Contractor's sole responsibility, but Contractor shall give Company immediate notice of any such spills, leaks, or other releases. Contractor shall be solely responsible for the storage, removal, and disposal of any excess or unused quantities of chemicals and materials which Contractor causes to be brought to the Work site.

13.04 Generated Wastes: Unless Company and Contractor expressly agree otherwise in writing, Contractor and its subcontractors shall be solely responsible for any wastes generated in the course of the Work, and Contractor shall handle, store, and dispose of such wastes in accordance with any Applicable Laws.

13.05 Survival: The obligations set forth in this Article shall survive termination or expiration of this Agreement.

ARTICLE 14 INSURANCE

14.01 Contractor's Insurance Obligation: Contractor shall provide and maintain, and shall require any subcontractor to provide and maintain the following insurance (and, except with regard to Workers' Compensation), naming Company as additional insured and waiving rights of subrogation against Company and Company's insurance carrier(s)), and shall submit evidence of such coverage to Company prior to the start of the Work. Seller's liability shall not be limited to its insurance coverage.

14.02 Insurance: Seller shall furnish certificates of insurance, in the name of the Big Rivers Electric Corporation, evidencing insurance coverage of the following types of minimum amounts:

a. Workman's compensation and employers liability insurance covering all employees who perform any of the obligations under the contract or Purchase Order, in the amounts required by law. If any employer or employee is not subject to the workers compensation laws of the

governing state, then insurance shall be obtained voluntarily to provide coverage to the same extent as though the employer or employee were subject to such laws.

b. Comprehensive general liability insurance covering all operation under the contract or Purchase Order: bodily injury - $1,000,000 each occurrence and aggregate; property damage - $1,000,000 each occurrence and aggregate. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable. Coverage should include contractual liability, broad form property damage liability, owner's and contractor's protective (independent contractor's) liability, products and completed operations hazard, explosion, collapse, and underground property damage hazard.

c. Automotive liability insurance on all motor vehicles used in conjunction with the contract or Purchase Order, whether owned, nonowned, or hired; bodily injury - $1,000,000 each person and $1,000,000 each occurrence; property damage $1,000,000 each occurrence. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable.

Certificates evidencing the insurance coverage's must be furnished before the commencement of work. If any work to be performed under this contract or Purchase Oder is sublet, the contractor will be required to furnish proof of insurance from all subcontractors evidencing equal to or better coverage.

14.03 Quality of Insurance Coverage: The above policies to be provided by Contractor shall be written by insurance companies which are both licensed to do business in the state where the Work will be performed and either satisfactory to Company or having a Best Rating of not less than A-. These policies shall not be materially changed or canceled except with thirty (30) days written notice to Company from Contractor and the insurance carrier. Evidence of coverage, notification of cancellation or other changes shall be mailed to: Attn: Manager, Supply Chain, Big Rivers Electric Corp., P.O. Box 24, Henderson, KY 42419.

14.04 Implication of Insurance: Company reserves the right to request and receive a summary of coverage of any of the above policies or endorsements; however, Company shall not be obligated to review any of Contractor's certificates of insurance, insurance policies, or endorsements, or to advise Contractor of any deficiencies in such documents. Any receipt of such documents or their review by Company shall not relieve Contractor from or be deemed a waiver of Company's rights to insist on strict fulfillment of Contractor's obligations under this Agreement.

14.05 Other Notices: Contractor shall provide notice of any accidents or claims at the Work site to Company's Manager, Risk Management at Big Rivers Electric Corporation., P.O. Box 24, Henderson, KY 42419 and Company's site authorized representative.

ARTICLE 15 WARRANTIES

Contractor warrants that:

(a) the Work will conform to any applicable Specification / Statement of Work; and any materials supplied in connection therewith shall be new, unused, and free from defect;

(b) the Work will be suitable for the purposes specified by Company and will conform to each statement, representation, and description made by Contractor to Company;

(c) the Work is not and shall not be subject to any encumbrance, lien, security interest, patent, copyright or trademark claims, infringements, or other defects in title; and

(d) any labor or services performed pursuant to this Agreement shall be performed in a competent, diligent, and timely manner in accordance with the highest professionally accepted standards.

Contractor shall respond in writing to any warranty claim by Company within five (5) business days of the delivery of notice of such claim to Contractor.

ARTICLE 16 OWNERSHIP OF INTELLECTUAL PROPERTY; PATENTS

16.01 Ownership: All inventions, discoveries, processes, methods, designs, drawings, blueprints, information, software, works of authorship and know-how, or the like, whether or not patentable or copyrightable (collectively, "Intellectual Property"), which Contractor conceives, develops, or begins to develop, either alone or in conjunction with Company or others, in connection with the Work, shall be "work made for hire" and the sole and exclusive property of Company. Upon request, Contractor shall promptly execute all applications, assignments, and other documents that Company shall deem necessary to apply for and obtain letters patent of the United States and/or copyright registration for the Intellectual Property and in order to evidence Company's sole ownership thereof.

16.02 Royalties and License Fees: Contractor shall pay all royalties and license fees which may be payable on account of the Work or any part thereof. In case any part of the Work is held in any suit to constitute infringement and its use is enjoined, Contractor within a reasonable time shall, at the election of Company and in addition to Contractor's obligations under Article 12, either (a) secure for Company the perpetual right to continue the use of such part of the Work by procuring for Company a royalty-free license or such other permission as will enable Contractor to secure the suspension of any injunction, or (b) replace at Contractor's own expense such part of the Work with a non-infringing part or modify it so that it becomes non-infringing (in either case with changes in functionality that are acceptable to Company).

ARTICLE 17 RELEASE OF LIENS

Contractor hereby releases for itself and its successors in interest, and for all subcontractors and their successors in interest, any and all claim or right of mechanics or any other type lien upon Company's or any other party's property, the Work, or any part thereof as a result of performing the Work. Contractor shall execute and deliver to Company such documents as may be required by Applicable Laws to make this release effective and shall give all required notices to subcontractors with respect to ensuring the effectiveness of the foregoing release against those parties. Contractor shall secure the removal of any lien that Contractor has agreed to release in this Article within five (5) working days of receipt of written notice from Company to remove such lien. If not timely removed, Company may remove the lien and charge all costs and expenses to Contractor, including without limitation costs of bonding off such lien.

ARTICLE 18 ASSIGNMENT OF AGREEMENT; SUBCONTRACTING

Upon prior written notice given to Company, Contractor shall not, by operation of law or otherwise, assign and/or subcontract any part of the Work or this Agreement without Company's prior written approval. Such approval, if given by Company, shall not relieve Contractor from full responsibility for the fulfillment of any and all obligations under this Agreement. Under any and all circumstances, any permitted assignee of Contractor, whether or not such assignee shall be a division, subsidiary and/or affiliate entity of Contractor, shall also be fully bound by the terms of this Agreement and, furthermore, upon request by Company, each of Contractor and its permitted assignee shall provide sufficient financial information, as determined by Company in its sole discretion, necessary to validate such assignee's credit worthiness and ability to perform under this Agreement.

ARTICLE 19 INVOICES AND EFFECT OF PAYMENTS

19.01 Invoices: Within a reasonable period of time following the end of each calendar month or other agreed period, Contractor shall submit an invoice to Company that complies with this Article. Payments shall be made within thirty (30) days of Company's receipt of Contractor's proper invoice, and, in the event that Company's payment is overdue, Contractor shall promptly provide Company with a notice that such payment is overdue. Contractor's invoices shall designate the Company location which is the responsible party. Such invoices shall reference the contract / Purchase Order number and shall also show labor, material, taxes paid (including without limitation sales and use taxes, duties, fees, and other assessments imposed by governmental authorities), freight, and all other charges (including without limitation equipment rental) as separate items. All invoices shall be submitted with supporting documentation and in acceptable form and quality to Company's authorized representative. Should Company dispute any invoice for any reason, payment on such invoice shall be made within thirty (30) days of the dispute resolution. Payment of the invoice shall not release Contractor from any of its obligations hereunder, including but not limited to its warranty and indemnity obligations. Invoices shall not be delivered with goods, unless

expressly authorized by the Company, but all correspondence and packages related to this Agreement shall reference the Purchase Order / contract number assigned by Company.

19.02 Surcharges: All charges must be pre-approved and referenced within the purchase order or contract. Unapproved charges will not be accepted and will cause the invoice to be rejected and returned. This includes, but is not limited to, surcharges, packing charges, core charges, deposits, and/or any other added costs.

19.03 Taxes (Projects): If Company provides Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, then Contractor shall not withhold or pay Kentucky sales or use taxes to the extent such exemption certificate applies to the Work (such exemption does not and shall not apply to any materials consumed by Contractor in performing the Work). **Contractor agrees that it shall not rely upon Company's direct pay authorization in not withholding or paying Kentucky sales or use taxes.** If Company does not provide Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, Contractor shall be solely responsible for paying all appropriate sales, use, and other taxes and duties (including without limitation sales or use tax with respect to materials purchased and consumed in connection with the Work) to, as well as filing appropriate returns with, the appropriate authorities. To the extent specifically included in the Contract Price, Contractor shall bill Company for and Company shall pay Contractor all such taxes and duties, but Company shall in no event be obligated for taxes and duties not specifically included in the Contract Price or for interest or penalties arising out of Contractor's failure to comply with its obligations under this Section.

Taxes (Goods): Do not bill Kentucky Sales Tax: Blanket Direct Pay Authorization maintained under 103 KAR 31:030, Permit # 108814.

19.04 Billing of Additional Work: All claims for payments of additions to the Purchase Order / Contract Price shall be shown on separate Contractor's invoices and must refer to the specific change order or written authorization issued by Company as a condition to being considered for payment.

19.05 Effect of Payments/Offset: No payments shall be considered as evidence of the performance of or acceptance of the Work, either in whole or in part, and all payments are subject to deduction for loss, damage, costs, or expenses for which Contractor may be liable under any Purchase Order or set-off hereunder. Company, without waiver or limitation of any rights or remedies of Company, shall be entitled from time to time to deduct from any and all amounts owing by Company to Contractor in connection with this Agreement or any other contract with Company any and all amounts owed by Contractor to Company in connection with this Agreement or any other contract with Company.

19.06 Evidence of Payment to Subcontractors: Contractor shall, if requested by Company, furnish Company with a certificate showing names of Contractor's suppliers and subcontractors hereunder, and certifying to Company that said suppliers and subcontractors have been paid in full.

ARTICLE 20 ROUTING OF SHIPMENTS

Company shall have the option of specifying the routing of shipments. If freight is included in the Contract Price, and such specified routing increases Contractor's shipping costs, Contractor shall immediately so notify Company, and should Company still specify the more expensive routing, then Company shall reimburse Contractor for the increase actually incurred thereby.

ARTICLE 21 TERM AND TERMINATION

21.01 Term: This Agreement shall commence on the date set forth above and shall survive in full force and effect until terminated as set forth below. A termination under this Article 21 based on certain Work shall only apply to the Statement of Work that covers such Work. Any Statements of Work that do not relate to such Work shall not be affected by such a termination.

21.02 Termination for Contractor's Breach: If the Work to be done under this Agreement shall be abandoned by Contractor, if this Agreement or any portion thereof shall be assigned by operation of law or otherwise, if the Work or any portion thereof is sublet by Contractor without the permission of Company, if Contractor is placed in bankruptcy, or if a receiver be appointed for its properties, if Contractor shall make an assignment for the benefit of creditors, if at any time the necessary progress of Work is not being maintained, or if Contractor is violating any of the conditions or agreements of this Agreement, or has

executed this Agreement in bad faith, Company may, without prejudice to any other rights or remedies it may have as a result thereof, notify Contractor to discontinue any or all of the Work and terminate this Agreement in whole or part. In the event that Section 365(a) of the Bankruptcy Code or some successor law gives Contractor as debtor-in-possession the right to either accept or reject this Agreement, then Contractor agrees to file an appropriate motion with the Bankruptcy Court to either accept or reject this Agreement within twenty (20) days of the entry of the Order for Relief in the bankruptcy proceeding. Contractor and Company acknowledge and agree that said twenty (20) day period is reasonable under the circumstances. Contractor and Company also agree that if Company has not received notice that Contractor has filed a motion with the Bankruptcy Court to accept or reject this Agreement within said twenty (20) day period, then Company may file a motion with the Bankruptcy Court asking that this Agreement be accepted or rejected, and Contractor shall not oppose such motion.

21.03 Effect of Termination for Contractor's Breach: From the effective date of such termination notice, Contractor shall vacate the site, whereupon Company shall have the right but not the obligation to take possession of the Work wherever located, and Contractor shall cooperate with Company and cause Contractor's subcontractors to cooperate with Company so that Company can effect such possession. In obtaining replacement services, Company shall not be required to request multiple bids or obtain the lowest figures for completing the Work and may make such expenditures as shall best accomplish such completion and are reasonable given the circumstances. The expenses of completing the Work in excess of the unpaid portion of the Contract Price, together with any damages suffered by Company, shall be paid by Contractor, and Company shall have the right to set off such amounts from amounts due to Contractor.

21.04 Termination for Company's Convenience: Company may terminate this Agreement or one or more Statements of Work in whole or in part for its own convenience by thirty (30) days' written notice at any time. In such event, Company shall pay Contractor all direct labor and material costs incurred on the Work that is subject to such Termination prior to such notice, plus any reasonable unavoidable cancellation costs which Contractor may incur as a result of such termination, plus indirect costs or overhead on the portion of the Work completed, computed in accordance with generally accepted accounting principles less salvage value. As an alternative to salvage value reduction, Company shall have the right in its sole discretion to take possession of all or part of the Work.

ARTICLE 22 PUBLICITY

Contractor shall not issue news releases, publicize or issue advertising pertaining to the Work or this Agreement without first obtaining the written approval of Company.

ARTICLE 23 CONFIDENTIAL INFORMATION

All information relating to the Work or the business of Company, including, but not limited to, drawings and specifications relating to the Work, and customer information, shall be held in confidence by Contractor and shall not be used by Contractor for any purpose other than for the performance of the Work or as authorized in writing by Company. In the event that the Contractor assigns the work to one or more subcontractors, a signed confidentiality agreement between the Contractor and each subcontractor(s) will be provided to the Company prior to the provision of any information described in the immediately preceding sentence or the performance of any Work by the subcontractor. All drawings, specifications, or documents furnished by Company to Contractor or developed in connection with the Work shall either be destroyed or returned to Company (including any copies thereof) upon request at any time.

ARTICLE 24 MISCELLANEOUS

24.01 Waiver: No waiver by Company of any provision herein or of a breach of any provision shall constitute a waiver of any other breach or of any other provision.

24.02 Headings: The headings of Articles, Sections, paragraphs, and other parts of this Agreement are for convenience only and do not define, limit, or construe the contents thereof.

24.03 Severability: If any provision of this Agreement shall be held invalid under law, such invalidity shall not affect any other provision or provisions hereof which are otherwise valid.

24.04 State Law Governing Agreement: This Agreement shall be governed by, and construed in accordance with, the laws of the Commonwealth of Kentucky, without regard to its principles of conflicts of laws.

24.05 Enforcement of Rights: Company shall have the right to recover from Contractor all expenses, including but not limited to fees for and expenses of inside or outside counsel hired by Company, arising out of Contractor's breach of this Agreement or any other action by Company to enforce or defend Company's rights hereunder.

24.06 No Third Party Beneficiaries: Except for Contractor and Company, there are no intended third party beneficiaries of this Agreement and none may rely on this Agreement in making a claim against Company.

24.07 Notices: All notices and communications respecting this Agreement shall be in writing, shall be identified by the contract number, and shall be addressed as follows (which address either party may change upon five (5) days prior notice to the other party).

To Company:
Big Rivers Electric Corp.
Attn: Director, Supply Chain
P.O. Box 24
Henderson, Kentucky 42419

To Contractor:
_____
_____
_____
_____
Fax No. _____

IN WITNESS WHEREOF, the parties have entered into this Agreement on the date set forth in the introductory paragraph of this Agreement.

COMPANY:	**CONTRACTOR:**
Big Rivers Electric Corp.	_____ **(Insert)**
Signature	*Signature*
_____	_____
Name (Please Print)	*Name (Please Print)*
_____	_____
Title	*Title*
_____	_____
Date	*Date*
_____	_____

APPENDIX D

EQUAL OPPORTUNITY ADDENDUM
To Be Inserted in Construction Contracts and
Subcontracts, and Materials Contracts and Purchase Orders

PART I

The Contractor represents that:

It has☐ does not have☐, 100 or more employees, and if it has, that

It has☐, has not☐, furnished the Equal Employment Opportunity -- Employers Information Report EEO-1. Standard Form 100, required of employers with 100 or more employees pursuant to Executive Order 11246 and Title VII of the Civil Rights Act of 1964.

The Contractor agrees that it will obtain, prior to the award of any subcontract for more than $10,000 hereunder to a subcontractor with 100 or more employees, a statement, signed by the proposed subcontractor, that the proposed subcontractor has filed a current report on Standard Form 100.

The Contractor agrees that if -it has 100 or more employees and has not submitted a report on Standard Form 100 for the current reporting year and that if this contract will amount to more than $10,000, the Contractor will file such report, as required by law, and notify the Owner in writing of such filing prior to the Owner's acceptance of this Proposal.

PART 11

CERTIFICATION OF NONSEGREGATED FACILITIES

The Contractor certifies that it does not maintain or provide for its employees any segregated facilities at any of its -establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Contractor certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Contractor agrees that a breach of this certification is a. violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest-rooms and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or. are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Contractor agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that it will retain such certifications in its files.

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

PART III

EQUAL OPPORTUNITY CLAUSE

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race,

color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to, the following 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.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) 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.

(5) 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 its books, records and accounts by the administering agency and the Secretary of Labor for purposes of investi - gation to ascertain compliance with such rules, regulations and orders.

(6) In the event of the Contractor's noncompliance with- the nondiscrimination clauses of this contract or with any of the said rules regulations or orders, this contract may be canceled, terminated or suspended in whole- or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized.in Executive Order 11,246 of September 24, 1965, and such ocher sanctions may be imposed and remedies invoked as provided in the said Executive Order or by rule, regulation or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) 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 cc vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for 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 administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The term "Contractor" shall also mean "Bidder" or " Seller" in case of materials and equipment contracts and purchase orders. and "Subcontractor" in the case of subcontracts.

The provisions of this addendum are not applicable to any. contract or subcontract not exceeding $10,000.

This addendum supersedes the similar representations and provisions which may be contained in the contract form to which this addendum is attached. The Contractor may disregard the superseded representations and provisions.

_____
CONTRACTOR

By _____

_____
TITLE

_____
DATE

RUS FORM 270 REV 7-70

APPENDIX E

U.S. DEPARTMENT OF AGRICULTURE

CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION - LOWER TIER COVERED TRANSACTIONS

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017, Section 3017.510, Participants' responsibilities. The regulations were published as Part IV of the January 30, 1989, Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the Department of Agriculture agency with which this transaction originated.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it not its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Organization Name | PR/Award Number or Project Name

Name(s) and Title(s) of Authorized Representative(s)

Signature(s) | Date

Form AD-1048 (1/92)

Instructions for Certification

1. By signing and submitting this form, the prospective lower tier participant is providing the certification set out on the reverse side in accordance with these instructions.

2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later than determined that the prospective lower tier participant knowingly
rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

4. The terms "covered transactions," debarred," "suspended," "ineligible,", "lower tier covered transactions," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.

5. The prospective lower tier participant agrees by submitting this form that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

6. The prospective lower tier participant further agrees by submitting this form that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.

7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Nonprocurement List.

8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

9. Except for transactions authorized under paragraph 5 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Form AD-1048

APPENDIX F

UNITED STATES DEPARTMENT OF AGRICULTURE

NOTICE TO APPLICANTS - CERTIFICATION/DISCLOSURE REQUIREMENTS RELATED TO LOBBYING

Section 319 of Public Law 101-121 (31 U.S.C.), signed into law on October 23, 1989, imposes new prohibitions and requirements for disclosure and certification related to lobbying on recipients of Federal contracts, grants, cooperative agreements, and loans. Certain provisions of the law also apply to Federal commitments for loan guarantees and insurance; however, it provides exemptions for Indian tribes and tribal organizations.

Effective December 23, 1989, current and prospective recipients (and their subtier contractors and/or subgrantees) will be prohibited from using Federal funds, other than profits from a Federal contract, for lobbying Congress or any Federal agency in connection with the award of a particular contract, grant, cooperative agreement or loan. In addition, for each award action in excess of $100,000 (or $150,000 for loans) on or after December 23, 1989, the law requires recipients and their subtier contractors and/or subgrantees to: (1) certify that they have neither used nor will use any appropriated funds for payment to lobbyists; (2) disclose the name, address, payment details, and purpose of any agreements with lobbyists whom recipients or their subtier contractors or subgrantees will pay with profits or **nonappropriated** funds on or after December 23, 1989; and (3) file quarterly updates about the use of lobbyists if materials changes occur in their use. The law establishes civil penalties for noncompliance.

If you are a current recipient of funding or have an application, proposal, or bid pending as of December 23, 1989, the law will have the following immediate consequences for you:

- You are prohibited from using appropriated funds (other than profits from Federal contracts) on or after December 23, 1989, for lobbying Congress or any Federal agency in connection with a particular contract, grant, cooperative agreement, or loan;

- you are required to execute the attached certification at the time of submission of an application or before any action in excess of $100,000 is awarded; and

- you will be required to complete the lobbying disclosure form if the disclosure requirements apply to you.

Regulations implementing Section 319 of Public Law 101-121 have been published as an Interim Final Rule by the Office of Management and Budget as Part III of the February 26, 1990, **Federal Register** (pages 6736-6746).

UNITED STATES DEPARTMENT OF AGRICULTURE

CERTIFICATION REGARDING LOBBYING - CONTRACTS, GRANTS, LOANS AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement;

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions;

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Organization Name | Award Number or Project Name

Name and Title of Authorized Representative

Signature | Date

APPENDIX G

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

Contractor Safety Credentials Assessment Program

(C-SCAP)

Document 3.0
Big Rivers Electric Corporation Contractor Safety Rules

Company Name: _____

Address: Street/PO Box _____ City _____ State _____ Zip _____

Contact Person Name (Authorized Representative)	Signature	Email	Phone
_____	_____	_____	_____

(If someone other than the "Contact Person" is to receive the C-SCAP pocket card template, please provide the following)

Name: _____ **Email:** _____ **Phone:** _____

Big Rivers Electric Corporation (BREC) is committed to: maintaining a proactive safety, health, and loss prevention program designed to protect life and property; providing a work environment where recognized health/safety hazards are controlled; and in compliance with all applicable regulatory and legal requirements. BREC holds employee and Contractor safety as one of its most important corporate values. Accordingly, no job, operating condition, or urgency of service can ever justify endangering the health and well-being of any employee or Contractor.

These rules do not replace the contractors' existing safety and health program(s), provided that their program(s) meet or exceed these and any additional site specific minimum requirements. Contractors' employees' not following applicable rules will be subject to removal from the job site.

The contractor is required to comply with all applicable federal and state safety laws and regulations. The contractor is responsible for conducting their work and activities safely. BREC expects and requires that contractors continuously update their employees with respect to safety issues relevant to the work and to take immediate corrective action when their employees violate safety rules or procedures.

Section I. General Safety Requirements

1. Contractors will comply with all applicable federal and state regulations and BREC's safety rules and programs relevant to the work performed.
2. Contractors will be responsible for providing their employees, and any subcontracted employers with all information provided by BREC regarding:
   - Occupational health and safety;
   - Exposure to atmospheric health, serious physical or chemical hazards; and
   - Precautionary measures and procedures for performing the work.
3. BREC's policy prohibits the Contractor's employees, agents or representatives from:
   - Consuming or possessing alcohol and/or non-prescription drugs while on BREC's job sites, including the parking lots;
   - Reporting to perform work on BREC's job sites with unauthorized drugs on his/her person or while under the influence of drugs or alcohol.
   - Performing work that involves operating heavy equipment or working at elevations when using prescribed medication that can cause drowsiness or otherwise impair the employee's ability to perform the work in a safe manner.
4. The following conduct is prohibited by BREC at and about the job site:
   - Theft, horseplay, gambling, sabotage or attempted sabotage.
   - Threatening, intimidating or abusing employees, customers, vendors or guests of BREC.
   - Fighting or creating or inciting a disturbance.
5. Firearms and other weapons are not allowed on BREC's job sites and/or facilities.
6. BREC has a smoke-free policy within all its buildings.
7. Attendance at job site safety meetings is required of the Contractor at the discretion of BREC's designated representative. At least one representative of the Contractor will attend job safety meetings.

8. The Contractor will report any Contractor employee Incident requiring medical attention to BREC's authorized representative immediately and provide a copy of the first report of injury. All injuries, requiring medical attention, must be reported within One (1) hour, even during off shifts.
9. Any Contractor's employee, who appears sick, extremely tired, or otherwise unable to perform his/her job in a safe manner will be reported to the Contractor's supervision for evaluation and possibly removed from the job site.
10. Contractors are responsible for establishing control measures to protect their employees, and/or employees under their control, from exposure to hazards (chemical, atmospheric health and physical) present at the job site.
11. The Contractor must provide electrical ground fault protection for employees using construction power (temporary branch circuits to include extension cords) through the use of approved ground fault circuit interrupters (GFCI). Additionally, Contractors must provide ground fault protection when using permanent facility power and using cord and plug equipment in wet or damp locations. Applies to 120-volt single phase 15 and 20-ampere receptacle outlets.
12. Contractor employees will work in full pants and shirts. Shorts and tank tops are not permitted unless otherwise specified. Some jobs will require wearing 100% cotton long sleeve shirts and pants, fire resistant (FR) clothing or ATPV (Arc Thermal Performance Value) rated clothing.
13. Contractors shall not transport employees in the beds of trucks.
14. All Contractors must receive authorization from BREC's authorized representative before performing work in areas posted as **"Dangerous or Hazardous."**
15. Contractors will provide a competent person to the job site as required by state and federal OSHA standards.
16. Contractors shall provide at a minimum, one bilingual employee for every maximum, group of eight non-English speaking employees. Any deviation requires approval from the BREC President & CEO, plant General Manager, or Vice President.
17. All contractors conducting work that require the use of a respirator or where there may be potential for atmosphere contamination must be clean-shaven and provide a documented respirator fit test.

Section II. Hazard Specific Requirements

The Contractor will ensure that the Contractor's employees are properly equipped and trained to comply with Federal and State regulations, and BREC standards; including but not limited to the following:

- **Personal Protective Equipment (PPE)**
- **Fall Management (personal fall arrest systems, scaffolding, walking work surfaces, ladders and floor and wall openings**
- **Chemical Safety/Hazard Communication**
- **Hazardous Waste and Chemical Spills**
- **Hot Work (Cutting and Welding)**
- **Asbestos**
- **High Voltage**
- **Control of Energy Sources (Lockout/Tagout)**
- **Trenching**
- **Confined Space Entry**

Section III. Enforcement of Safety Rules

The Contractor is responsible for the health and safety of employees under their control. Enforcement of these rules, as well as other recognized safety rules, is the responsibility of the Contractor. The evaluation does not constitute acceptance of the Contractor's safety programs or work practices nor, in any way relieve a Contractor of full responsibility for meeting all appropriate OSHA and other regulations to ensure the safety of employees under their control. Whenever there is a jurisdictional question of which standard will apply (e.g. Big Rivers or the Contractor's), the most stringent safety requirement will take precedence. The Contractor must document exceptions and attach them to this form. Contractors and their employees who do not follow these rules are subject to removal from this project, as well as being banned from future projects/contracts.

Document 3.0
Contractor Safety and Health Questionnaire and Checklist

Big Rivers Electric Corporation is committed to providing a safe and healthy workplace for its employees and the employees of Contractors. To qualify to perform work at BREC, companies must complete the Contractor Safety Credentials Assessment Program. To begin that process companies shall provide BREC the following information and agree to obtain the requested information from all subcontractors utilized, and to provide it upon request.

Please provide a brief description of the work activities to be conducted for Big Rivers: _____

_____

_____

_____

_____

In the table below, provide the three most recent full years of history for the area or region for which this questionnaire applies. In addition, attach copies of applicable OSHA 300A Forms & verification of your workers comp. Experience Modification Rate (EMR)/discount information. Applications without copies of 300A forms and/or EMR may be delayed until received.

ITEM	DESCRIPTION	2012	2011	2010
A	Interstate Experience Modification Rate (EMR)			
B	Recordable Injury Incident Rate (RIR) = (# of Injuries x 200,000 ÷ Total Hours Worked)			
C	Lost Workday Injury and Illness Incident Rate (LWDIR) = (# of Lost-time Injuries and Illnesses x 200,000 ÷ Total Hours Worked)			
D	NAICS (North American industry Classification System) Code			
E	**Using the OSHA 300 Logs from the facilities providing labor, please provide the following:** Severity Rate (Total days lost due to injury or industrial illness) = (Total # days away from work x 200,000 ÷ Total Hours Worked)			
F	Number of Injuries and Illnesses (Columns 1-6 of OSHA 300 Log)			
G	Number of Lost Workday Cases (Column H of OSHA 300 Log)			
H	Number of Injury Related Fatalities (Column G of OSHA 300 Log)			
I	Employee hours worked in each of the last 3 years (If unknown use # of employees x 2080)			
J	Total number of full time employees in each of the last 3 years			
K	Total number of temporary employees in each of the last 3 years			

Document 3.0

If more space is needed, please use reverse side(s) or separate sheet(s)

	Question	Y / N	Comments
1.	Does your company have a written safety and health program?		
2.	Does your company have a written Hazard Communication Program? Is it available for review?		
3.	Does your company have a written environmental compliance assurance program? Is it available for review?		
4.	Who in your company is responsible for coordinating your safety and health program? Name/Job Title: _____ Phone # ( ) _____ Is safety and health a full time responsibility for this position?		
5.	Who conducts OSHA training for your employees? Name/Job Title: _____ Is this person an employee of your company or a consultant?		
6.	Has your company received a citation(s) from a regulatory agency during the last three years? If yes, describe citation(s). (Use additional sheet(s) if necessary)		
7.	Does your company perform safety audits/reviews? If yes, are safety audits documented?		
8.	Who reviews the safety audit/review and how often? Job Title: _____		
9.	Does your company provide/require the following? Hard Hats (ANSI-Z89.1)(29 CFR 1910.135 Foot Protection (ASTM-F2413)(29 CFR 1910.136) Eye Protection (ANSI-Z41.1)(29 CFR 1910.133) Hand Protection (ANSI-Z41.1)(29 CFR 1910.138) Hearing Protection (ANSI-Z41.1)(29 CFR 1910.95) Fall Protection (ANSI-Z41.1)(29 CFR 1926.501 or 1910.66) Respiratory Protection (ANSI-Z41.1)(29 CFR 1910.134) **BREC does not provide PPE (Personal Protective Equipment) to Contractor personnel**		
10.	In addition to regulatory required Personal Protective Equipment, what other PPE is required or supplied? If any, please describe or list: _____		

11.	Does your company use temporary employees? If yes, what percentage of the total hours worked last year was performed by temporary employees? _____% If you are awarded a contract for work at BREC, what percentage of the estimated hours will be performed by temporary employees? _____% How do you ensure that temporary employees have the required OSHA training?		
12.	Does your company have scheduled documented employee safety meetings? If yes, how often? _____		
13.	Who conducts the safety meetings? Job Title: _____		
14.	What manager(s)/supervisor(s) participate in the safety meetings? Job Titles: _____		
15.	Are meetings reviewed and critiqued by manager(s)/supervisor(s)?		
16.	Does your company hold on-site (tailgate/toolbox) safety meetings? If yes, how often? _____ Who conducts these (tailgate/toolbox) safety meetings? Job Titles: _____ Is documentation available for review?		
17.	Does your company have policy requiring written accident/incident reports? Are follow-up investigations conducted? If yes, are corrective actions taken to prevent future incidents?		
18.	Does your company document, investigate and discuss near miss incidents? If yes, is documentation available for review?		
19.	Are accident/incident reports reviewed by manager(s)/supervisor(s)?		
20.	Does your company have a written policy regarding drug screening or testing of your employees? If yes, is a copy available for review?		

21.	Indicate the circumstances in which your company employees may be subject to drug screening. Employment Random Probable Cause Post-Incident Periodic Other		
22.	Does your company have a policy dealing with emergency actions to be taken should a chemical spill occur?		
23.	Are all documents, pertaining to this questionnaire available for auditing? If no, please explain.		
24.	Does your company use subcontractors? If you do use sub-contractors, do you qualify subcontractors based on their ability to address safety, health and environmental requirements? Do you verify that subcontractors meet regulatory requirements?		
25.	Do you employ "non-English" speaking persons or persons with limited English skills? If so, how do you insure that OSHA and your in-house safety programs are adequately communicated?		
26.	If you use or may use sub-contractors to assist with work conducted at Big Rivers Electric Corporation, please explain how you will verify that the employees of that sub-contractor have OSHA training that is commensurate for the tasks which they will be undertaking.		
27.	If you use or may use employees from a temporary labor pool or employees from a union hall, please explain how you will verify that the individuals have OSHA training that is commensurate for the tasks which they will be undertaking.		
28.	If you use or may use the services of employees from a different division of your corporation, please explain how you will verify that the individuals have OSHA training that is commensurate for the tasks which they will be undertaking.		
29.	Does your company provide and require the use of Class 2 & 3 traffic control garments to comply with work zone traffic control requirements?		
30.	Does your company require its employees to use arc protective clothing while conducting work in the vicinity of energized parts? If yes; what is the ATPV (Arc Thermal Performance Value) rating of the following items within your protective clothing system? Shirt Pants Jacket/Coat Cover-all/Bibs Rain gear Traffic Control Garment Other: (please list) _____ Have your employees received training on the hazards of electrical arcs? Have your employees received training on the proper use of your company arc protective clothing system?		

Document 3.0

Big Rivers Electric Corporation
Contractor Health and Safety Training Acknowledgement Form

Please respond to all applicable items with "YES or NO"

PROGRAMS/TRAINING	REFERENCE SOURCE	WRITTEN PROGRAM Y/N	EMPLOYEES ARE TRAINED Y/N
Asbestos (awareness)	OSHA 29 CFR 1926.1101		
Asbestos Class I, II, and III (abatement)	OSHA 29 CFR 1926.1101		
Asbestos Class I, II and III (removal supervisor)	OSHA 29 CFR 1926.1101		
Bloodborne Pathogens	OSHA 29 CFR 1910.1030		
Chainsaw Safety	OSHA 29 CFR 1910.266		
Communications Facilities	OSHA 29 CFR 1910.269		
Confined Space Entry	OSHA 29 CFR 1910.146		
Crawler, Locomotive and Truck Cranes	OSHA 29 CFR 1910.180		
Daily Equipment Inspection/Walk-Around	OSHA 29 CFR 1910.1000; 29 CFR 1926.1101		
Electrical Safety	OSHA 29 CFR 1910.269		
Electrical Safety	OSHA 29 CFR 1910.332		
Emergency Action Plan	OSHA 29 CFR 1910.38		
Excavations	OSHA 29 CFR 1926.651		
Explosives	OSHA 29 CFR 1910.109		
Fall Protection	OSHA 29 CFR 1926.500		
Fire Extinguisher	OSHA 29 CFR 1910.157		
First Aid/CPR	OSHA 29 CFR 1910.151		
Forklifts	OSHA 29 CFR 1910.178		
Hand and Portable Power Tools and Equipment – General	OSHA 29 CFR 1910.241, 242, 243		
Hazard Communication	OSHA 29 CFR 1910.1200		
Hazwoper - Awareness Level	OSHA 29 CFR 1910.120		
Hazwoper 8 Hour	OSHA 29 CFR 1910.120		
Hazwoper 24 Hour	OSHA 29 CFR 1910.120		
Hazwoper 40 Hour	OSHA 29 CFR 1910.120		
Hazwoper Supervisor 8 Hour	OSHA 29 CFR 1910.120		
Hearing Conservation	OSHA 29 CFR 1910.95		
Incipient Fire Fighting	OSHA 29 CFR 1910.157		
Jacks	OSHA 29 CFR 1926.305		
Ladder Safety	OSHA 29 CFR 1926.1060		
Lead Worker	OSHA 29 CFR 1926.62		
Lead Supervisor	OSHA 29 CFR 1926.62		
Line-Clearance Tree Trimming Operations	OSHA 29 CFR 1910.269		
Lockout/Tagout Affected/Authorized Person	OSHA 29 CFR 1910.147		
Lockout/Tagout Affected/Authorized Person	OSHA 29 CFR 1910.269		
Mobile Cranes	OSHA 29 CFR 1926.550		
New Employee Orientation	OSHA 29 CFR 1910.119		

PROGRAMS/TRAINING	REFERENCE SOURCE	WRITTEN PROGRAM Y/N/NA	EMPLOYEES ARE TRAINED Y/N/NA
Overhead and Gantry Cranes	OSHA 29 CFR 1910.179		
Overhead Lines	OSHA 29 CFR 1910.269		
Oxygen-Fuel Gas Welding and Cutting	OSHA 29 CFR 1910.253		
Personal Protective Equipment	OSHA 29 CFR 1910.132		
Process Safety Management	OSHA 29 CFR 1910.119		
Radiation Awareness	902 KAR 100:019		
Respiratory Protection	OSHA 29 CFR 1910.134		
Rigging, Equipment & Material Handling	OSHA 29 CFR 1926.251		
Scaffolding (erector)	OSHA 29 CFR 1926.451		
Scaffolding (user)	OSHA 29 CFR 1926.451		
Servicing Rim Wheels	OSHA 29 CFR 1910.177		
Substations	OSHA 29 CFR 1910.269		
Trenching and Shoring	OSHA 29 CFR 1926.650; 651; 652; and Subpart P		
Underground Electrical Installations	OSHA 29 CFR 1910.269		
Work Zone Traffic Control	Manual on Uniform Traffic Control Devices		
Working on or Near Exposed Energized Parts	OSHA 29 CFR 1910.269		

Please provide any additional information that you feel would be valuable in this process:

(To be completed by Big Rivers Electric Corporation)

Vendor Name: _____ **Approved: Yes** _____ **No** _____

Sign & Date: _____ _____

Coleman Representative **Sebree Representative**

_____ _____

Wilson Representative **Corporate Representative**

Developed: August, 2008
1st Revision: August, 2010
2nd Revision: December, 2012

APPENDIX H

Big Rivers

New Vendor/Vendor Information Change Form

1. Vendor Information

Vendor Name – Please enter company name.

A) Corporate Headquarters:

Street:

Town or City:

Zip/Postal Code:

State/Prov.:

Country:

Telephone:

Facsimile:

Email address:

Website:

B) Ordering Address (where to send purchase orders)

Street:

Town or City:

Zip/Postal Code:

State/Prov.:

Telephone:

Email address:

Facsimile:

Sales Contact:

PO Delivery Method: Post, Email, or Fax:

C) Remit-To Address (where to send invoice payments)

Street:

Town or City:

Zip/Postal Code:

State/Prov.:

Country:

Accounts Receivable Contact :

Telephone:

DUNS Numbering | | | | | | | | | |

(Data Universal Numbering System)

Apply for a D-U-N-S Number, the industry standard for business listings

Do you accept Credit Cards? Yes _____ No _____

Definitions:
Corporate Headquarters – Most active office for your company that does business with Big Rivers Electric Corporation (BREC).
Ordering Address – Location(s) to which you wish BREC to SEND purchase orders. Use attachments as necessary.
Remit-to Address – Location to which you wish BREC to SEND invoice payments. Please attach copy of invoice for reference.

D) Payment Terms (If different then Net 30)

E) Supplier Type (Select one of the following)

Professional Services	☐
Charity/Contribution	☐
Contractor (Services Only)	☐
Retailer (Materials only)	☐
Contractor/Retailer (Services & Materials)	☐
Other	☐

Specify Products and Services

_____

Does your business hold a Retail/Resale Certificate?
☐ Yes ☐ No

If yes, please provide your certificate number.

_____

Is your business one of the following (If yes, please include copy of certification) Check all the applicable categories:

MBE ☐ Yes ☐ No

WBE ☐ Yes ☐ No

Small Disadvantaged Business (SDB)? ☐ Yes ☐ No

Veteran ☐ Yes ☐ No

Service Disabled Veteran ☐ Yes ☐ No

Is your Company union affiliated?
☐ Yes ☐ No

If Yes, which union affiliated organization

_____

Under 15 U.S.C. 645(d), any person who misrepresents its size status shall (1) be punished by a fine, imprisonment, or both; (2) be subject to administrative remedies; and (3) be ineligible for participation in programs conducted under the authority of the Small Business Act.

_____ _____ _____

Signature of person providing information **Title** **Date**

Indicate the following special classifications:

☐ Standard Industry Code (SIC Code): _____

☐ North American Industry Code Standard (NAICS Code): _____

☐ European Classification Code (eClass Code): _____

F) Contact Information

Who can we contact if we have questions concerning your qualifications and/or this submission?

Name:

Telephone:

E-mail:

Who can we contact "AFTER HOURS" for EMERGENCY SERVICE requirements?

Name:

Telephone:

E-mail:

The following section is to be completed by BREC personnel only.

Date of Input: **Input By:**

Date of Certification: **Type of Certification:** GSA PSA Qualified

Is this Vendor Request for One Time use only? * Yes _____ **No** _____ *If yes, this vendor will have a future inactive date inserted at time of creation based on the Payment Terms.

G) If you are a Foreign-based company, indicate your TAX/VAT Registration: _____

H) If you are a United States-based company, complete Form W-9 as indicated. We are required by law to obtain a tax identification number when making a reportable payment to you. Failure to provide this information could result in a tax withholding of 31% and you may be subject to a $50 penalty imposed by the I.R.S. In completing Form W-9, be sure that you CHECK APPROPRIATE BOX FOR CORPORATION/SOLE PROPRIETORSHIP / PARTNERSHIP OR OTHER. If individual or sole proprietorship, please list individual's name (please print) and Social Security Number. Make sure that YOUR TAX ID NUMBER IS 9 DIGITS.
The Business Name listed here will appear on purchase orders and checks.

APPENDIX I

Form **W-9**
(Rev. December 2011)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See Specific Instructions on page 2.

Name (as shown on your income tax return)

Business name/disregarded entity name, if different from above

Check appropriate box for federal tax classification:
☐ Individual/sole proprietor ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶

☐ Other (see instructions) ▶

☐ Exempt payee

Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

City, state, and ZIP code

List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Social security number

			–			–				

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign Here Signature of U.S. person ▶ Date ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business. Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

The person who gives Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States is in the following cases:

- The U.S. owner of a disregarded entity and not the entity,
- The U.S. grantor or other owner of a grantor trust and not the trust, and
- The U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person, do not use Form W-9. Instead, use the appropriate Form W-8 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity not subject to backup withholding, give the requester the appropriate completed Form W-8.

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS a percentage of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the instructions below and the separate Instructions for the Requester of Form W-9.

Also see *Special rules for partnerships* on page 1.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account, for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name

If you are an individual, you must generally enter the name shown on your income tax return. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first, and then circle, the name of the person or entity whose number you entered in Part I of the form.

Sole proprietor. Enter your individual name as shown on your income tax return on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name/disregarded entity name" line.

Partnership, C Corporation, or S Corporation. Enter the entity's name on the "Name" line and any business, trade, or "doing business as (DBA) name" on the "Business name/disregarded entity name" line.

Disregarded entity. Enter the owner's name on the "Name" line. The name of the entity entered on the "Name" line should never be a disregarded entity. The name on the "Name" line must be the name shown on the income tax return on which the income will be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a domestic owner, the domestic owner's name is required to be provided on the "Name" line. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on the "Business name/disregarded entity name" line. If the owner of the disregarded entity is a foreign person, you must complete an appropriate Form W-8.

Note. Check the appropriate box for the federal tax classification of the person whose name is entered on the "Name" line (Individual/sole proprietor, Partnership, C Corporation, S Corporation, Trust/estate).

Limited Liability Company (LLC). If the person identified on the "Name" line is an LLC, check the "Limited liability company" box only and enter the appropriate code for the tax classification in the space provided. If you are an LLC that is treated as a partnership for federal tax purposes, enter "P" for partnership. If you are an LLC that has filed a Form 8832 or a Form 2553 to be taxed as a corporation, enter "C" for C corporation or "S" for S corporation. If you are an LLC that is disregarded as an entity separate from its owner under Regulation section 301.7701-3 (except for employment and excise tax), do not check the LLC box unless the owner of the LLC (required to be identified on the "Name" line) is another LLC that is not disregarded for federal tax purposes. If the LLC is disregarded as an entity separate from its owner, enter the appropriate tax classification of the owner identified on the "Name" line.

Other entities. Enter your business name as shown on required federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name/ disregarded entity name" line.

Exempt Payee

If you are exempt from backup withholding, enter your name as described above and check the appropriate box for your status, then check the "Exempt payee" box in the line following the "Business name/ disregarded entity name," sign and date the form.

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following payees are exempt from backup withholding:

1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2),

2. The United States or any of its agencies or instrumentalities,

3. A state, the District of Columbia, a possession of the United States, or any of their political subdivisions or instrumentalities,

4. A foreign government or any of its political subdivisions, agencies, or instrumentalities, or

5. An international organization or any of its agencies or instrumentalities.

Other payees that may be exempt from backup withholding include:

6. A corporation,

7. A foreign central bank of issue,

8. A dealer in securities or commodities required to register in the United States, the District of Columbia, or a possession of the United States,

9. A futures commission merchant registered with the Commodity Futures Trading Commission,

10. A real estate investment trust,

11. An entity registered at all times during the tax year under the Investment Company Act of 1940,

12. A common trust fund operated by a bank under section 584(a),

13. A financial institution,

14. A middleman known in the investment community as a nominee or custodian, or

15. A trust exempt from tax under section 664 or described in section 4947.

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 15.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 9
Broker transactions	Exempt payees 1 through 5 and 7 through 13. Also, C corporations.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 5
Payments over $600 required to be reported and direct sales over $5,000 [1]	Generally, exempt payees 1 through 7 [2]

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney, and payments for services paid by a federal executive agency.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on page 2), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local Social Security Administration office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, below, and items 4 and 5 on page 4 indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on the "Name" line must sign. Exempt payees, see *Exempt Payee* on page 3.

Signature requirements. Complete the certification as indicated in items 1 through 3, below, and items 4 and 5 on page 4.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner [3]
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulation section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity [4]
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulation section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or "DBA" name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 1.

***Note.** Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, social security number (SSN), or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov*. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

AVP INC.
General Contractor
P. O. Box 973 • Henderson, KY 42419
4869 Old Madisonville Road • Henderson, KY 42420
Ph. 270-826-7711 • Fax 270-827-3723

December 5, 2013

Big Rivers Electric Corporation
Attn: Rob Toerne
201 Third Street
PO Box 24
Henderson, KY. 42420-0024

This is formal proposal to bid the hydroexcavation .

Owner will mark excavation locations.
Owner will provide clean water for equipment.
Owner will provide adequate dumpsite and is responsible for management of spoils.

We plan on using H2X,LLC from Decatur TX for the Hydroexcavating of 450LF of ditch about 6" To 12" wide and 8' deep.
We will furnish all barricading, hoses, dewatering, excavating, materials, flowable fill for complete backfill , Sawing and removal of all black top.

We will furnish all labor, Materials, And Equipment to complete this task.
We will coordinate with owner and all other parties involved in this project.

This can be done for the total sum of: $ 89,130.00

Labor	$ 34,800.00
Equipment	$ 44,330.00
Materials	$ 10,000.00

Thank you for the chance to bid this project and look forward to working with you on it.

Please call Billy Miller @ 270-724-7714 if you have any questions.
Price may be withdrawn if not excepted within 30 days.

Sincerely yours; Billy Miller

Billy Miller-Estimator
Big Rivers-3

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
222766	0	1

VENDOR:
AVP, INC
PO BOX 973
4869 OLD MADISONVILLE RD
HENDERSON, KY 42419

SHIP TO:
R. D. Green Station
9000 HWY 2096
Robards,KY 42452

BILL TO:
201 Third Street
Henderson,KY 42420

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 80607	DELIVER TO	DATE OF ORDER/BUYER 27-DEC-13 Frederick, Dana Leigh	REVISED DATE/BUYER Frederick, Dana Leigh
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6139 888-514-3178	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA	VENDOR CONTACT/TELEPHONE (270) 826-7711

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO:
DANA FREDERICK - HEADQUARTERS PHONE (270) 844-6139
FAX (888) 514-3178
EMAIL: DANA.FREDERICK@BIGRIVERS.COM

INVOICING REGARDING THIS ORDER REQUIRES INDIVIDUAL TOTALS FOR LABOR AND MATERIALS. (KENTUCKY SALES & USE TAX REQUIREMENT)

ALAN POWELL QUOTE DATED 12/5/13

A signed copy of the General Services Agreement (GSA) is on file at Big Rivers Electric Corporation and is hereby incorporated by reference.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	LABOR FOR THE GREEN STATION MATS HYDROEXCAVATION		1	EACH	$ 34800.00	$ 34,800.00
2.1	EQUIPMENT		1	EACH	$ 44330.00	$ 44,330.00
3.1	MATERIALS		1	EACH	$ 10000.00	$ 10,000.00

TOTAL $ 89,130.00

Dana R Frederick

HENDERSON MUNICIPAL POWER & LIGHT
STATION TWO

SPECIFICATION FOR MERCURY SORBENT TRAP SAMPLING SYSTEMS

RFQ# H-14-1001

BID DUE DATE: OCTOBER 1, 2014, 8:00 A.M. CST

HENDERSON MUNICIPAL POWER AND LIGHT
HENDERSON STATION TWO

HMP&L STATION TWO

1.0 SCOPE

1.1. Throughout this Specification, the Owner will be known as City of Henderson, Utility Commission dba Henderson Municipal Power and Light (HMP&L), and the Operator will be known as Big Rivers Electric Corporation (BREC).

1.2. Big Rivers Electric Corp. on behalf of Henderson Municipal Power and Light will be accepting bids to supply Three (3) M&C STS Mercury Sorbent Trap Sampling Systems (or Owner and Operator approved equal) as per the attached data sheets for use at the HMP&L Station Two Power Plant.

1.3. Pursuant to KRS 45A.343(2), the Owner requires each Bidder bidding on a Specification to reveal to the Utility Commission in writing any final determination of a violation by the Bidder or any Sub-contractor within the previous five years, pursuant to KRS Chapters 136, 139, 141, 337, 338, 341 and 342 that apply to the Bidder or any Sub-contractor, and to be in continuous compliance with the provisions of those chapters of Kentucky Revised Statute that apply to the Contractor or Supplier or any Sub-contractor for the duration of the Contract.

1.4. In accordance with Kentucky Revised Statues (KRS) 45A.490 to 45A.494, prior to a contract being awarded to a bidder on a public agency contract, a resident bidder of the Commonwealth of Kentucky will be given a preference over a nonresident bidder registered in any state that gives or requires a preference over bidders from the other state. All Bidders must therefore complete and submit the following attached forms:

1.4.1. RECIPROCAL PREFERENCE: (Effective February 4, 2011)
1.4.2. REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS CLAIMING RESIDENT.

1.5. Supplier agrees to defend, indemnify and hold harmless the Owner and Operator, its directors, officers, employees and agents, from any and all damage, loss, claim, demand, suit, liability, penalty or forfeiture of every kind and nature, including but not limited to costs and expenses of defending against the same, and payment of any settlement or judgment therefore, by reason of (a) injuries or deaths to persons, (b) damages to property, (c) pollution, contamination of or other adverse effects on the environment, or (d) violations of governmental laws, regulations or orders, whether suffered directly by Owner or Operator or indirectly by reason of third party claims, demands or suits, resulting or alleged to have resulted from acts or omissions of Supplier, its employees, agents, Sub-contractor's or other representatives, or from their presence on the premises of the Owner, or otherwise from performance of this Specification. This indemnity will survive termination or expiration of this Specification.

1.6. The Supplier will not assign, or sublet any part of the Work or this Specification without first obtaining the Owner and Operator written approval. Such approval, if given, will not

relieve the Supplier from full responsibility for the fulfillment of all obligations under this Specification.

1.7. The work to be performed in accordance with this Specification includes all work listed which, in the opinion of the Owner and the Operator, is necessary to provide Mercury STMS Products that meets the intent of this Specification.

1.8. No changes or deviations from this Specification will be permitted, nor will additional compensation be allowed, without advance written approval from the Owner and Operator.

1.9. If any conditions, circumstances, or occurrences not covered within this Specification are encountered or, if there are any doubts as to the meaning, contact the Owner's designated representative.

2.0 GENERAL DESCRIPTION

2.1 The Owner and Operator are seeking a Supplier to provide three (3) M&C STS Mercury Sorbent Trap Sampling Systems (or Owner and Operator approved equal).

2.2 HMP&L Station Two is located 17 miles south of Henderson, Kentucky just off of Highway 41. The address is:

HMP&L Station Two
9000 Hwy 2096
Robards, KY 42452

3.0 BIDDER & SUPPLIER RESPONSIBILITIES

3.1 Supplier will be responsible for the quality of the materials provided.

3.2 The Supplier will abide by the items in this Specification unless the Owner and Operator agree in writing to any changes. All requests for changes must be made in writing.

3.3 It is the responsibility of the Bidder to advise the Owner and Operator of conflicting or confusing requirements or omissions of information which are necessary for a clear understanding of this Specification before the date set for the bid opening.

3.4 All parts supplied will be new and not reconditioned.

3.5 The proposal will include all costs to the Bidder, including freight, FOB job site, and all applicable taxes, including sales tax, payroll tax, etc., and profit as a fixed price. This section supersedes any other language in our Standard Terms and Conditions which may be construed as conflicting.

3.6 The Bidder is required, upon request, to have satisfactorily completed at least five similar jobs and provide references for each.

4.0 GENERAL REQUIREMENTS

4.1 The Supplier will provide three (3) M&C STS Mercury Sorbent Trap Sampling Systems (or Owner and Operator approved equal).

One Mercury Sorbent Trap Monitoring Systems will be supplied each for:

1) Henderson Unit One FGD outlet stack
   Measurement probe will have a minimum one meter stack insertion on 16' stack, mounted to a 4" ANSI 150# flange with a portal length of 14.5". Mercury STMS probe and control unit will be mounted at the stack monitoring level of 200' elevation.
2) Henderson Unit Two FGD outlet stack
   Measurement probe will have a minimum one meter stack insertion on 16' stack, mounted to a 4" ANSI 150# flange with a portal length of 14.5". Mercury STMS probe and control unit will be mounted at the stack monitoring level of 200' elevation.
3) Henderson Unit One and Two (common) Bypass stack
   Measurement probe will have a minimum one meter stack insertion and be mounted to a 6" ANSI 150# flange with a portal length of 48". Mercury STMS probe and control unit will be mounted at the stack monitoring level of 175' elevation.

4.2 Bidder will design, manufacture, furnish and deliver a three (3) Mercury STMS, including all necessary equipment and appurtenances as hereinafter specified for complete and operable systems, certified and documented per all applicable United States Environmental Protection Agency (USEPA) regulations.

4.3 The Mercury STMS sampling operation will be capable of measuring total vapor phase mercury (Hg) emissions as specified in compliance with all requirements promulgated by the US EPA in 40 CFR 63, Subpart UUUUU, as well as Appendix A to Subpart UUUUU, and 40 CFR 60, Appendix B, Performance Specification 12B, including the latest revisions in effect during the time of shipment.

4.4 Bidder will furnish three (3) Mercury STMS, as specified herein, to monitor the flue gases at the specified locations. The Mercury STMS will consist of all instrumentation and auxiliary equipment necessary to continuously measure Hg in wet or dry stacks.

4.5 The Mercury STMS will include the equipment required to monitor Hg emissions continuously by using paired sorbent traps containing iodated charcoal or other suitable sorbent medium. The Mercury STMS will consist of a dual channel sampling probe, an umbilical line, moisture removal components, airtight sample pumps, mass flow meters and an automated data acquisition and handling system.

4.6 The Mercury STMS will utilize microprocessor-based hardware mounted in the STMS enclosure or at a remote location and will be designed to allow unattended operation of the system between regularly scheduled trap removal.

4.7 The Mercury STMS must include standard automated climate control with A/C and heater and be designed to withstand an ambient temperature range of 30°F to 110°F.

4.8 Probe, umbilical, and sample extraction and conditioning equipment will be provided as a complete integrated system.

4.9 Two (2) Mercury STMS must be capable of wall mounting for Henderson Unit One and Henderson Unit Two FGD Outlet Stacks, and one (1) Mercury STMS must be capable of stack mounting for the Henderson Unit One and Two, (common) Bypass Stack. Mercury STMS will be constructed of fiberglass NEMA 4X enclosures. Mercury STMS will be of compact design to limit interference with catwalk access around stack.

4.10 The cabinet provided by Bidder will include all sample gas transport and conditioning equipment, power supplies, power regulating equipment, circuit breakers, power distribution panels, terminal blocks, bulkhead fittings, connectors, sample lines, tubing, fittings, etc. All components mounted in Mercury STMS cabinet will be securely mounted piped/tubed and/or wired prior to delivery to the jobsite. Cabinet components that are not preinstalled in the cabinets prior to shipment will be shipped as separate items in appropriate, shock-resistant shipping containers.

4.11 The Mercury STMS must be capable of providing purge air to sorbent traps when not sampling. The Mercury STMS purge air source will be plant instrument air.

4.12 The Mercury STMS will use NIST traceable mass flow meters (MFM) to determine the total sample volume of gas metered on a dry basis in units of standard cubic meters. The MFM's must be accurate to < 1.0 percent and be capable of being audited and calibrated quarterly to meet applicable regulations. The MFM's must offer flow rates ranging from 80 cm3 - 2000 cm3 as their standard configuration.

4.13 The Mercury STMS will use variable speed DC sample pumps.

4.14 The Mercury STMS will use a Peltier chiller (or Owner and Operator approved equal) for moisture removal capable of drying the sample gas to 4.0 degrees Celsius. H20 will be extracted from the chiller with peristaltic pumps.

4.15 The sample probe material will be Hastelloy, and will be designed for easy removal from the stack port for trap insertion or removal. The probe will be capable of supporting glass sorbent traps up to 36" in length and 7 mm or 10 mm diameters. The Bidder must provide as an option, a fully integrated probe monorail system for the Henderson Unit One and Two, (common) Bypass Stack to facilitate easy probe insertion and removal.

4.16 The probe will be provided with a cam-type lever coupler that quickly and easily connects to a 4" or 6" ANSI, 150 lb flange. The probe will be heated to prevent condensation and designed for easy, leak-free trap installation and exchange. The probe will be heated for the entire length and will maintain constant probe temperature above dewpoint. High-low temperature alarm contacts will be provided in the Mercury STMS enclosure. Heater controllers will be located in the Mercury STMS enclosures. The sample probes will be of sufficient lengths to meet EPA requirements and to obtain a representative sample.

4.17 The sample line will be heated for the entire length and will maintain a temperature above dewpoint. High-low temperature alarm contacts will be provided in the Mercury STMS enclosure. Heater controllers will be located in the Mercury STMS enclosures. All necessary tubing and hardware required for a complete installation will be provided by the Bidder. The sample line will be suitably protected from the weather and damage from the operating environment.

4.18 The sample line will be designed such that its orientation does not affect its performance. Bidder will allow for a maximum umbilical cord length of 100 feet.

4.19 The sample transport systems will maintain any sample gas above the acid dew point temperature at all times.

4.20 The Mercury STMS will utilize acid gas and moisture scrubbers, provide alarms for acid trap loading.

4.21 The Mercury STMS will be provided with locally mounted standard, intuitive, touch panel Human Machine Interface (HMI) color display for operator setup, system control and monitoring, trending, and alarm signaling.

4.22 Bidder will include the integration of extensive Modbus library to include inputs for stack gas flow rate, stack temperature and barometric pressure at a minimum.

4.23 Fiber Optic Multiplexing interface to MODBUS will be included to communicate with the existing DAHS (Spectrapak). Remote Desktop Protocol (RDP) & VNC capable remote factory software upgrade, troubleshooting and assistance.

4.24 The Mercury STMS will provide the capability to automatically calculate and maintain Proportional Sampling (ratio of stack gas flow rate to sample flow rate) at ± 25% throughout entire monitoring period and report results.

4.25 The Mercury STMS will use PLC and PC based data collection and reporting software. The PLC will run continuously to provide control and collect data. The PLC will have the ability to expand its capabilities and flexibility for programming specific customer requirements.

4.26 The Mercury STMS will provide a routine for conducting pre-test and post-test leak checks and record all results. The PLC will record sample run vacuum readings.

4.27 The Mercury STMS will have the ability to be operated in either the manual mode or in the auto sequenced operation test mode once all setup parameters have been established and entered.

4.28 The Mercury STMS will allow the option of reporting system operating data in 1, 15, 30 or 60 second intervals and outputting directly to a printer and/or a memory stick.

4.29 The system will provide remote access via TCP/IP, and optional handheld remote devices.

4.30 The Bidder will quote the cost for the commissioning and hands on personnel training for BREC technicians. The training will be a maximum of one day held on site. Training will be scheduled to occur during the normal Monday through Friday day shift. This will include 6 technicians for the one day training. Please provide the number of hours included for commissioning.

4.31 The Supplier will provide four (4) hard copies and one (1) electronic copy of all applicable drawings, replacement parts lists, recommended spare parts list with pricing, operating and maintenance manuals, and lubrication guide upon delivery. Only AutoCAD Release 14 or greater and/or Adobe Acrobat electronic formats will be accepted. One additional hard copy will be provided to:

Mr. Ken Brooks
Power Plant Coordinator
Henderson Municipal Power & Light
100 Fifth Street
Henderson, KY 42419

4.32 The Owner and Operator will withhold 10% of the total amount until all testing is complete and the system is approved by the EPA.

5.0 APPLICABLE CODES AND STANDARDS

5.1 Applicable codes and standards referred to in this Specification will establish minimum Requirements for equipment, materials, and construction, and will be superseded by more stringent requirements of drawings and specifications when and where they occur.

5.2 Reference to standard specifications of any technical society, organization, or association or to codes of local or state authorities, will mean the latest standard, code, specification or tentative specification adopted and published at the date of taking bids, unless specifically stated otherwise.

5.3 All equipment furnished and/or installed under this Specification will be so designed, fabricated, assembled, installed and placed into service so that such equipment will conform to the latest Federal and KENTUCKY OCCUPATIONAL SAFETY AND HEALTH STANDARDS including but not limited to 29 CFR Part 1910 as adopted by 803 KAR 2:020.

5.4 All construction methods and tools will conform to the applicable provision of the latest Federal and KENTUCKY OCCUPATIONAL SAFETY AND HEALTH STANDARDS including but not limited to 29 CFR Part 1910 as adopted by 803 KAR 2:020 and 29 CFR Part 1926 as adopted by 803 KAR 2:030.

5.5 Any conflicts between this Specification and applicable codes and standards will be referred to the Owner and Operator for a decision thereon and will not be the cause for additional compensation by the Owner or Operator.

5.6 Materials, equipment, and construction work will comply with all applicable governmental and industry standards, specifications, codes, and regulations listed, but not limited to, those given to other divisions of this Specification

6.0 PROPOSAL AND SUBMITTAL

6.1 The Bidder will submit a list of any Sub-contractors that may be used in the performance of this Specification. The Bidder will provide references for all Sub-contractors that include company contacts and reference contacts.

6.2 Bidders will submit with this proposal its payment terms. If a cash discount is not offered for early payment then terms will be Net 30 days.

6.3 The Bidder will submit a firm dollar amount to supply the specified product as per the attached bid sheet. All special incentive terms of payment and discounts must be clearly described.

6.4 ***All products will be on site no later than December 20, 2014.***

6.5 All bids will be valid for ninety (90) days from the opening of the bid.

6.6 The Bidder will submit, in writing, any exceptions or clarifications to this Specification with the bid proposal.

6.7 The submittal must be returned to the Operator's Purchasing Department as defined on the RFQ form.

6.8 The proposal will be submitted as a **SEALED BID** with a public bid opening with the results read aloud. The Bidder will submit the bid in the envelope provided with the bid package. Big Rivers Electric Corporation will only accept bid proposals by mail or hand delivered. Fax proposals will not be accepted. Big Rivers Electric Corporation will

require four (4) sets of the bid proposals; one (1) signed original and three (3) copies. BIDS ARE DUE ON OCTOBER 1, 2014 BY 8:00 A.M. (CENTRAL). Bid proposals received after this date and time will be returned unopened. The bid proposals will be submitted to the Big Rivers Electric Corporation's Sourcing and Materials Department ATTN. of:

Mark R. Foster C.P.M., CPIM
Sr. Procurement Agent
Big Rivers Electric Corporation
Reid/Green/Station Two
9000 State Highway 2096
Robards, KY 42452

6.9 Bidders will also **SUBMIT TIME AND MATERIAL RATES for any work on this project that may be classified as extra work** by the Owner and Operator. If the Bidder charges a separate rate for overtime and or holiday pay, the Bidder will include a clear explanation of the overtime and holiday policies, and will include a list of all observed holidays. The Bidder will also provide a cost plus percentage markup for any materials that may be needed for additional/emerging work for this project. This percentage is to be factored on the base cost of the material before taxes are applied.

6.10 This inquiry implies no obligation on the part of the Big Rivers Electric Corporation or the City of Henderson Utility Commission. The Bidder offers the prices, terms, and delivery herein set forth in this proposal.

6.11 Any addenda to this bid package will be signed by the Bidder and will be returned with the sealed proposal.

6.12 The Bidder may submit alternate bids, however, alternates will be considered only if a complete original bid is submitted.

6.13 The Bidder will submit sufficient information and detail with the bid to permit full understanding and evaluation of the equipment and services being offered.

6.14 Any exception taken to the Specification will be justified in writing, i.e., safety, reliability, efficiency, and increase or decrease in cost.

6.15 Failure to follow any or all of the instructions listed in the Specification may lead to Bidder disqualification.

6.16 All expenses incurred by the Bidder in the development of this bid are the sole responsibility of the Bidder.

6.17 The City of Henderson Utility Commission reserves the right to reject any or all Bids, to waive informalities therein and to consider exceptions and clarifications therein in order to

determine the lowest and best bid; to reject any or all non-conforming, non-responsive, unbalanced or conditional Bids; to reject the Bid of any Bidder if the Utility Commission believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by the Utility Commission. The Utility Commission also reserves the right to negotiate contract terms with the Successful Bidder. By submitting a Bid to the Utility Commission, the Bidder agrees that such procedures will be without liability on the part of the Utility Commission for any damage or claim brought by the Bidder because of such rejections or procedures, nor will the Bidder seek any recourse of any kind against the Utility Commission because of such rejections or procedures. The filing of any Bid in response to this Invitation will constitute an agreement of the Bidder to these conditions.

6.18 The Bidder will detail the number of years this unit will be supported.

6.19 All questions should be emailed no later than 4 days before the bid is due to: Mark Foster at mark.foster@bigrivers.com

7.0 WARRANTY

7.1 The Supplier will warrant to the Owner that all products and materials will be in accordance with this Specification and will be free from defects in material and workmanship. Prompt notice of all defects will be given to the Supplier. All defective material or work, whether or not in place, may be rejected, corrected or accepted by the Owner. There will be a one year / eighteen month minimum warranty of merchantability and fitness for use as defined in this Specification on all packaged Product delivered. The Supplier may choose to extend the warranty period at his discretion. Within the warranty period, any material or work that is found to be defective, the Supplier will promptly, at its option, without cost to Owner, either correct such defective material or work, or, replace it with non-defective material or work. If Supplier does not promptly comply, or in an emergency where delay would cause serious risk of loss or damage, Owner may, upon written notice to the Supplier, have the defective material or work corrected or the rejected material or work removed and replaced, and all direct costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals) will be paid by Supplier.

APPENDIX A
Bid Clarifications and Exceptions

This page must be signed and returned. If there are no Clarifications and Exceptions, write 'None' and sign.

Big Rivers
ELECTRIC CORPORATION
Your Touchstone Energy Cooperative

BID CLARIFICATIONS AND/OR EXCEPTIONS

Bidder offers the following clarifications and/or exceptions taken to any requirement or provision of this Request For Quotation and any proposed modifications or replacement language for each clarification or exception (If none, so state).

Bidder understands that unless itemized above, no other clarifications or exceptions to this Request for Quotation are taken by the Bidder.

_____
Bidder

_____
Signature of Executing Party

_____
Date

APPENDIX B
Standard Terms & Conditions

This page does not need to be returned.

STANDARD TERMS AND CONDITIONS

If Seller and Company have a signed General Services Agreement ("GSA") on file then said document shall be applicable to the subject matter of this order, and said GSA is incorporated by reference in this order as if fully set forth herein. Additionally, in the event of a conflict between the terms and conditions set forth in that GSA and this order, the terms and conditions set forth in the GSA shall prevail and control.

1. **Billing Instructions:** A separate itemized invoice shall be submitted to the "Bill To" address shown on the face of the purchase order for each lot of material shipped or delivered. Invoicing must show purchase order number, line item number and Company item identification number on the invoice and all papers and packages relating to this order.

2. **Surcharges:** All charges must be pre-approved and referenced within the purchase order or contract. Unapproved charges will not be accepted and will cause the invoice to be rejected and returned. This includes, but is not limited to, surcharges, packing charges, core charges, deposits, and/or any other added costs.

3. **Payment Terms:** Unless otherwise agreed, payment terms are net 30 days on receipt of properly submitted invoice. Any cash discount terms must be shown on the invoice. Unless agreed upon in advance, COD order will not be accepted.

4. **Title and Freight:** All goods will be FOB Destination unless agreed to in advance and such changes shall be shown on the Purchase Order. Freight must be transported as listed on the front of the purchase order. Freight that is prepaid and added to the invoice must be substantiated by attaching to the invoice, original transportation bills receipted to the carrier. No charges for packing, package or drayage will be accepted, except on express agreement to such charges.

5. **Quality:** All material furnished must be the best of their respective kinds. We reserve the right to reject any and all material received which does not conform to our specifications, or, if not so specified, which does not conform to standard specifications. Material received in excess of quantity ordered and/or at higher price than quoted, will not be accepted unless shipment has been authorized by Company. Seller expressly warrants that the goods and/or services shall:
    a. Comply strictly with the provisions of the order and all specifications, drawings, and exhibits referred to in the order or thereafter furnished by Company;
    b. Be new, merchantable, and of the most suitable grade in accordance with the highest industry standards and specifications;
    c. Be fit for Company's intended purposes;
    d. Be in full compliance with all applicable laws, ordinances, regulations, codes, and facility rules, including those relating to safety; and
    e. Be free from any patent, copyright, or trademark claims, infringements or rights of others. All such warranties shall extend for a reasonable time, but in no case less than eighteen (18) months after delivery or twelve (12) months after the start of regular use by Company, whichever occurs first.

6. **Force Majeure:** Neither party shall be liable to the other for any damages for any failure to perform or for any delays or interruptions beyond that party's reasonable control in performing any of its obligations under this Agreement due to acts of God, fires, floods, earthquakes, riots, war, acts of terrorism, civil insurrection, acts of the public enemy, or acts or failures to act of civil or military authority, unless the time to perform is expressly guaranteed. Contractor shall advise Company immediately of any anticipated and actual failure, delay, or interruption and the cause and estimated duration of such event. Any such failure, delay, or interruption, even though existing on the date of this Agreement or on the date of the start of the Work, shall require Contractor to within five (5) days submit a recovery plan detailing the manner in which the failure, delay, or interruption shall be remedied and the revised schedule. Contractor shall diligently proceed with the

Work notwithstanding the occurrence thereof. This Article shall apply only to the part of the Work directly affected by the particular failure, delay, or interruption, and shall not apply to the Work as a whole or any other unaffected part thereof.

7. **Indemnification:** The Seller shall be responsible for and shall defend, indemnify, and save harmless Big Rivers Electric Corporation from any and all damage, loss, claim, demand, suit, liability, fine, penalty, or forfeiture of every kind and nature, including professional fees and court costs of defending against the same and payment of any settlement or judgment therefore, by reason of:
    1.) Injuries or deaths to persons
    2.) Damages to or destruction of real, personal, or intangible properties
    3.) Violations of any other rights asserted against Big Rivers Electric Corporation, including patents, trademarks, trade names, copyrights, contract rights, and easements
    4.) Violations of governmental laws, regulations, or orders whether suffered directly by Big Rivers Electric Corporation itself, or indirectly by reason of claims, demands, or suits against it, resulting or alleged to have resulted from acts of omissions of Seller, its employees, agents, business invitees, or other representatives or from their presence on the premises of Big Rivers Electric Corporation, either solely or in occurrence with any alleged joint negligence of Big Rivers Electric Corporation,

    Big Rivers Electric Corporation shall be liable for its sole negligence and to the extent of its concurrent negligence. Indemnification of Big Rivers Electric Corporation includes its officers, employees, and agents.

8. **Warranties:** The Seller warrants that all material on this order conforms to all applicable state and federal laws and regulations with respect to the manufacturer, procurement, sale, and use of such material and Seller agrees to indemnify and save harmless the Company from all claims arising by reason of any violation of said laws or regulations in connection therewith.

    a. It is agreed by the Seller that any right, cause of action, or remedy under the warranties or undertakings assumed or imposed upon the Seller under this order shall extend without exception to the Company or upon whose behalf this order is issued by the Company, as the interest of such company shall appear.

9. **Status of Seller:** The Seller agrees that the relationship established by this order constitutes him an independent contractor, and that no tax, assessment or legal liability of the Seller, or of his agents or employees, becomes by reason of this order an obligation of the Company; Seller further agrees that in the event any sales tax is levied on the sale of any of the material furnished on this order in the state of origin or shipment such sales tax shall be borne by the Seller and that should any use tax be levied or applicable on the use of such material by the Company such tax will be handled by the Company with the taxing authorities in the state of such use and shall not be in any way included in the invoice of the Seller.

10. **Health & Safety:** Seller and Seller's subcontractors are responsible to ensure that their employees comply with Kentucky occupational safety & health laws relating to equipment & operational practices as well as the Company's safety program. Failure to comply with these laws and programs may constitute cause for corrective action ranging from Notice to Correct the unsafe condition or act to removal of personnel from the premises.

11. **Safety:** In the case of entry by the Seller, or of any of the Seller's agents or employees, upon the property or premises of the Company, for the purpose of construction, erection, inspection or delivery under this order, the Seller agrees to provide all necessary and sufficient safeguards and to take all proper precautions, against the occurrence of accidents, injuries or damages to any person or property and to responsible for and to indemnify and save harmless the Company from all loss or damage and any or all claims arising by reason of accidents, injuries or damage to any persons or property in connection with such work, except such as may be the sole and direct result of negligence on the part of the Company, and from all fines, penalties or loss incurred by reason of the violation of any law, regulation, or ordinance; and further agrees to defend at the Seller's expense any and all suits or actions civil or criminal arising out of such claims or matters.

12. **Insurance:** Seller shall furnish certificates of insurance, in the name of the Big Rivers Electric Corporation, evidencing insurance coverage of the following types of minimum amounts:

    a. Workman's compensation and employers' liability insurance covering all employees who perform any of the obligations under the contract or Purchase Order, in the amounts required by law. If any employer or employee is not subject to the workers compensation laws of the governing state, then insurance shall be obtained voluntarily to provide coverage to the same extent as though the employer or employee were subject to such laws.
    b. Comprehensive general liability insurance covering all operation under the contract or Purchase Order: bodily injury - $1,000,000 each occurrence and aggregate; property damage - $1,000,000 each occurrence and aggregate. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable. Coverage should include contractual liability, broad form property damage liability, owner's and contractor's protective (independent contractor's) liability, products and completed operations hazard, explosion, collapse, and underground property damage hazard.
    c. Automotive liability insurance on all motor vehicles used in conjunction with the contract or Purchase Order, whether owned, nonowned, or hired; bodily injury - $1,000,000 each person and $1,000,000 each occurrence; property damage $1,000,000 each occurrence. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable.

    Certificates evidencing the insurance coverages must be furnished before the commencement of work. The certificates must include a provision that no change in, or cancellation of, any policy listed in the certificates will be made without thirty (30) days written notice to Big Rivers Electric Corporation. If any work to be performed under this contract or Purchase Oder is sublet, the contractor will be required to furnish proof of insurance from all subcontractors evidencing equal to or better coverage.

    The Seller shall cause its insurer to waive all subrogation rights against the Company, except with regard to Worker's Compensation, and evidence thereof satisfactory in form and substance to Company shall be exhibited in the Certificate of Insurance. Seller's liability shall not be limited to its insurance coverage. The Company shall be added as an Additional Insured under the Seller's Commercial General Liability, Auto Liability and Excess Liability policies.

13. **Conflict of Interest:** In the event any employee of the Company holds a financial interest in the Seller, whether the Seller is individual, corporate or otherwise, Seller will disclose such interest upon the face of this order. Failure of the Seller to make such disclosure shall relieve this company of any obligations under this purchase order. The company reserves the right to reject any such order at any time after the issuance hereof.

14. **Confidentiality:** The specifications, drawings, designs, manufacturing data and other information transmitted to the Seller by the Company in connection with the performance of this purchase order are the property of the Company and are disclosed in confidence upon the condition that they are not to be reproduced or copied or used for furnishing information or equipment to other, or for any other purpose detrimental to the interest of the Company.

15. **OSHA Compliance:** The Seller warrants that the goods to be furnished hereunder comply with the requirements of the Occupational Safety and Health Act of 1970, as amended.

16. **NAFTA:** Where made aware of it's application by buyer, the Seller warrants that the goods furnished hereunder enable buyer to comply with the REA 'Buy American' clause which requires buyer, to the extent practicable and reasonable, to use in the expenditure of REA funds only unmanufactured articles, materials, and supplies mined or produced in the U.S., Mexico, or Canada and only manufactured articles, materials, and supplies manufactured in the U.S., Mexico, or Canada substantially all from articles, materials, or supplies mined, produced, or manufactured in the U.S., Mexico, or Canada.

17. **Time is of the essence**: If any goods are not delivered or services performed within the specified times, or within a reasonable time if no time is specified, then the Company may terminate the order by notice to the Seller in addition to exercising all other rights and remedies available to the Company under applicable law. All materials and work are subject to the Company's acceptance. Payment shall not constitute acceptance.

18. **Changes to the order:** The Company reserves the right at any time to change the specifications, quantity ordered, and/or delivery date. Such changes may result in adjustments in the price or delivery schedule in accordance with the pricing and delivery structure of the order.

19. **Termination:** The Company shall have the right at any time with or without cause to terminate the order by written, telegraphic, or electronic notice to the Seller. In case of the Seller's default, the Company shall have all rights and remedies available under applicable law. In no case shall the Company be liable for special, incidental or consequential damages. The Company shall not have any liability for such termination except as follows:
    a. In case of termination of an order for goods specially manufactured for the Company, if the Seller is not in default, then the Company shall be liable for actual costs incurred by the Seller prior to the notice of termination pursuant to the order up to the price of the goods.
    b. In case of termination of an order for services, if the Seller is not in default, the Company shall be liable for payment for services performed prior to the notice of termination.
    c. In case of termination of an order for goods not specially manufactured for the Company, if the Seller is not in default, the Company shall not have any liability for termination of the order. Company shall have the right to return any goods purchased from the Seller as long as such goods have not been specially manufactured for Company and are being stocked by the Seller at the time the Company returns the goods.

20. **EEO Compliance:** To the extent applicable, the Seller shall comply with all of the following Equal Employment Opportunity provisions, which are incorporated herein by reference:
    a. Equal Opportunity regulations set forth in 41CFR 60-1.4(a) and (c) prohibiting discrimination against any employee or applicant for employment because of race, color, religion, sex, or national origin;
    b. Vietnam Era Veterans Readjustment Assistance Act regulations set forth in 41 CFR 60-250.4 relating to the employment and advancement of disabled veterans and veterans of the Vietnam era;
    c. Rehabilitation Act regulations set forth in 41 CFR 60-741.4 relating to the employment and advancement of qualified disabled employees and applicants for employment;
    d. Clause known as "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals" set forth in 15 USC 637(d)(3); and
    e. The subcontracting plan requirements of 15 USC 637(d).

21. **Independent Contractor:** Nothing herein shall be deemed to constitute the Seller, or any of the Sellers' employees or agents, to be the agent, representative or employee of the Company. The Seller shall be an independent contractor and shall have sole responsibility for and control over the details and means of performance.

22. **Assignment:** The Seller shall not assign its rights or obligations hereunder wholly or in part, voluntarily, by operation of law, or otherwise without first obtaining the written consent of the Company. Subject to the foregoing, the provisions hereof shall be binding upon the successors and assigns of the parties hereto.

23. **Governing Law:** The transactions and agreements between the Seller and the Company shall be governed by the subject to the law and jurisdiction of the Commonwealth of Kentucky.

24. **MSDS:** As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200) and certain other Applicable Laws, Contractor or its subcontractors shall provide Material Safety Data Sheets ("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Agreement. Contractor and its subcontractors shall provide Company with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any Applicable Laws in effect at the worksite. **No asbestos or lead containing materials shall be incorporated into any Work**

performed by Contractor or otherwise left on the Work site without the prior written approval of Company. Contractor and its subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Agreement is subject to any Applicable Laws.

25. **Sales Tax:** The invoicing regarding this order requires individual totals for labor and materials for the calculation of Kentucky sales tax & use tax requirement.

    Do not bill Kentucky Sales Tax: Blanket Direct Pay Authorization maintained under 103 KAR31:030, Permit # 108814.

26. **Binding Effect:** This purchase order, together with any written instructions issued hereunder and any attachments hereto, contains the complete and final agreement between the Company and the Seller and any agreement that purports to modify the terms and conditions hereof shall not be binding upon the Company unless made in writing and signed by the Company's authorized representative.

APPENDIX C
Data Sheets

This page does not need to be returned.

TEST SUMMARY

PLANT	STACK	TECHNICIAN	RUN HOURS	,Av STACK FLOW	Av FLOW cc/min	R-REF	STATUS
Stack	2	NS	163.78	429.54	247.66	17.01	PASS

SORBENT STREAM A (ST_A)

Trap Ident	Trap Type	Spiked	Total Liters	Av cc/min	R-ref	R-%error	Pre Leak	Post L
OL189939	appk	6500ng	2 433.84	247.67	17.00	PASS	PASS	PAS

ST_A PRE-STS LEAK SUMMARY PASS
Date: 02/28/2014 Time: 10:17:09
Calc. Allowed: 6.80 cc/min
Measured: 6.56 cc/min Vacuum: 16.20"Hg

ST_A POST-STS LEAK SUMMARY PASS
Date: 03/07/2014 Time: 08:38:30
Cala Allowed: 9.91 cc/min
Measured: 7.14 cc/min
Vacuum: 15.17 "Hg

SORBENT STREAM B (ST_B)

Trap Ident	Trap Type	Spiked	Total Liters					
OL189948	appk	6500ng	2 433.61	247.64	17.02	PASS	PASS	PASS

ST_B PRE-STS LEAK PASS
SUMMARY Date: 02/28/2014 Time: 10:17:09
Calc. Allowed: 6.80 cc/min
Measured: 6.54 cc/min
Vacuum: 15.74"Hg

ST_B POST-STS LEAK SUMMARY PASS
Date: 03/07/2014 Time: 08:38:30
Calc. Allowed: 9.91 cc/min
Measured: 6.53 cc/min
Vacuum: 15.88 "Hg

APPENDIX D
Bid Sheets

This page must be filled out and returned.

BID SHEET

DESCRIPTION	Labor	Material	Project Total
Base Bid			
Taxes required to be included per 3.5. Are taxes included: YES or NO:			
FREIGHT required to be included per 3.5. Is Freight included: YES or NO:			
COST PLUS % for materials that might be added to order as emerging work:		**COST + _____%**	
Submit Labor Rate sheet that might be added to order as emerging work.			

APPENDIX E
Reciprocal Preference Documents

This page must be filled out and returned.

Bid #:_____

REQUIRED AFFIDAVIT FOR BIDDERS, OFFERORS AND CONTRACTORS CLAIMING RESIDENT BIDDER STATUS

FOR BIDS AND CONTRACTS IN GENERAL:
The bidder or offeror hereby swears and affirms under penalty of perjury that, in accordance with KRS 45A.494(2), the entity bidding is an individual, partnership, association, corporation, or other business entity that, on the date the contract is first advertised or announced as available for bidding:

1. Is authorized to transact business in the Commonwealth; and
2. Has for one year prior to and through the date of advertisement
   a. Filed Kentucky corporate income taxes; and
   b. Made payments to the Kentucky unemployment insurance fund established in KRS 341.49; and
   c. Maintained a Kentucky workers' compensation policy in effect.

Henderson Municipal Power & Light reserves the right to request documentation supporting a bidder's claim of Resident Bidder Status. Failure to provide such documentation upon request may result in disqualification of the bidder or contract termination.

_____ _____
Signature Printed Name

_____ _____
Title Date

Company Name _____

Address _____

_____

_____

Subscribed and sworn to before me by:

_____ _____
(Affiant) (Title)

of _____ this _____ day of _____, 20___
(Company Name)

_____ My commission expires:_____
Notary Public

[seal of notary]

HMP&L

Bid #:_____

RECIPROCAL PREFERENCE: (Effective February 4, 2011)

In accordance with Kentucky Revised Statutes (KRS) 45A.490 to 45A.494, prior to a contract being awarded to a bidder on a public agency contract, a resident bidder of the Commonwealth of Kentucky shall be given a preference over a nonresident bidder registered in any state that gives or requires a preference over bidders from the other state. The preference shall be equal to the preference given or required by the state of the nonresident bidder.

Any individual, partnership, association, corporation, or other business entity claiming resident bidder status shall submit along with its bid response a notarized affidavit (form attached) that affirms that it meets the criteria to be considered a resident bidder as set forth in KRS 45A.494(2). A nonresident bidder shall submit to HMPL, along with its bid response, a copy of its Certificate of Authority to transact business in the Commonwealth of Kentucky as filed with the Kentucky, Secretary of State. The location of the principal office identified therein shall be deemed the state of residency for that bidder. If the bidder is not required by law to obtain said Certificate, the state of residency for that bidder shall be deemed to be that which is identified in its mailing address as provided in its bid.

Bidders must select and check one option below and return this document with bid.

☐ This company is a resident bidder of the Commonwealth of Kentucky **or** this company is a nonresident bidder meeting the following requirements:

1. Is authorized to transact business in the Commonwealth; and
2. Has for one year prior to and through the date of advertisement
   a. Filed Kentucky corporate income taxes; and
   b. Made payments to the Kentucky unemployment insurance fund established in KRS 341.49; and
   c. Maintained a Kentucky workers' compensation policy in effect.

The Required Affidavit for Bidders, Offerors and Contractors Claiming Resident Bidder Status form attached must be completed and returned with bid.

☐ This company is not a resident bidder nor does it meet the requirements as listed in Items 1 and 2 above for nonresident bidders claiming resident status in the Commonwealth.

What is your state of residency? _____

Does your state grant "Contract Bid Preference? (circle one) No / Yes

What is the Preference Percentage for your state? _____ %

_____ Company

_____ Signature

_____ Date

_____ Printed Name

Big Rivers ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
228528	0	1

SHIP TO:
BIG RIVERS ELECTIC CORP
SEBREE STATION - ATTN: WAREHOUSE
9000 State Route 2096
ROBARDS,KY 42452

BILL TO:
BIG RIVERS ELECTIC CORP
SEBREE STATION - ATTN: WAREHOUSE
9000 State Route 2096
ROBARDS,KY 42452

VENDOR: **M AND C PRODUCTS ANALYSIS TECHNOLOGY INC**
6019 OLIVAS PARK DR
STE G
VENTURA, CA 93003

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 59936	DELIVER TO	DATE OF ORDER/BUYER 05-NOV-14 Foster, Mark	REVISED DATE/BUYER Foster, Mark
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-5565 888-730-6935	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA BEST WAY POSSIBLE	VENDOR CONTACT/TELEPHONE (805) 654-6970

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

ATTN: ROBERT DANIEL (RFQ H-14-1001) M&C QUOTATION # 1006995

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	H1; M&C SORBENT TRAP SYSTEM DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 58930.00	$ 58,930.00
2.1	H1; MOXA MEDIA CONVERTER DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 675.00	$ 675.00
3.1	H1: 100' HEATED SAMPLE LINE DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 7135.00	$ 7,135.00
4.1	CRATE DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 450.00	$ 450.00
5.1	FREIGHT DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 275.00	$ 275.00
6.1	H2: M&C SORBENT TRAP SYSTEM DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 58930.00	$ 58,930.00
7.1	H2; MOXA MEDIA CONVERTER DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 675.00	$ 675.00
8.1	H2: 100' HEATED SAMPLE LINE DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 7135.00	$ 7,135.00
9.1	CRATE DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 450.00	$ 450.00
10.1	FREIGHT		1	EACH	$ 275.00	$ 275.00

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

VENDOR: **M AND C PRODUCTS ANALYSIS TECHNOLOGY INC**
6019 OLIVAS PARK DR
STE G
VENTURA, CA 93003

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
228528	0	2

SHIP TO:
BIG RIVERS ELECTIC CORP
SEBREE STATION - ATTN: WAREHOUSE
9000 State Route 2096
ROBARDS,KY 42452

BILL TO:
BIG RIVERS ELECTIC CORP
SEBREE STATION - ATTN: WAREHOUSE
9000 State Route 2096
ROBARDS,KY 42452

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
	DELIVER TO:GALBRAITH, MICHAEL T					
11.1	NIST CALIB 2 LPM MFM DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 4500.00	$ 4,500.00
12.1	STS SYSTEM TRAINING DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 4832.00	$ 4,832.00
13.1	MICROMINI DC PUMP DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 756.50	$ 756.50
14.1	MICROMINI VITON GASKET KIT DELIVER TO:GALBRAITH, MICHAEL T		4	EACH	$ 80.00	$ 320.00
15.1	STS SCUBBER REFILL FOR TWO COLUMNS DELIVER TO:GALBRAITH, MICHAEL T		16	EACH	$ 87.40	$ 1,398.40
16.1	PERISTALTIC PUMP GEARMOTOR DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 425.00	$ 425.00
17.1	PERISTALTIC PUMP HEAD DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 350.00	$ 350.00
18.1	P-PUMP PHARMED BPT 25' TUBING DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 275.00	$ 275.00
19.1	POWER SUPPLY DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 596.00	$ 596.00
20.1	DISPOSABLE INLINE FILTER DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 422.50	$ 422.50
21.1	MASS FLOWMETER DELIVER TO:GALBRAITH, MICHAEL T		1	EACH	$ 3024.00	$ 3,024.00
22.1	10MM PTFE FERRULE SET DELIVER TO:GALBRAITH, MICHAEL T		4	EACH	$ 6.96	$ 27.84

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
228528	0	3

SHIP TO:
BIG RIVERS ELECTIC CORP
SEBREE STATION - ATTN: WAREHOUSE
9000 State Route 2096
ROBARDS,KY 42452

BILL TO:
BIG RIVERS ELECTIC CORP
SEBREE STATION - ATTN: WAREHOUSE
9000 State Route 2096
ROBARDS,KY 42452

VENDOR:
M AND C PRODUCTS ANALYSIS TECHNOLOGY INC
6019 OLIVAS PARK DR
STE G
VENTURA, CA 93003

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
23.1	FITTING, TUBE, 10MMT X 3/8 NPT BORE THRU DELIVER TO:GALBRAITH, MICHAEL T QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO: MARK FOSTER - SEBREE STATION PHONE (270) 844-5565 FAX (888) 730-6935 EMAIL: mark.foster@bigrivers.com		4	EACH	$ 16.75	$ 67.00

TOTAL $ 151,924.24

Mark Foster

STANDARD TERMS AND CONDITIONS

If Seller and Company have a signed General Services Agreement ("GSA") on file then said document shall be applicable to the subject matter of this order, and said GSA is incorporated by reference in this order as if fully set forth herein. Additionally, in the event of a conflict between the terms and conditions set forth in that GSA and this order, the terms and conditions set forth in the GSA shall prevail and control.

1. **Billing Instructions:** A separate itemized invoice shall be submitted to the "Bill To" address shown on the face of the purchase order for each lot of material shipped or delivered. Invoicing must show purchase order number, line item number and Company item identification number on the invoice and all papers and packages relating to this order.

2. **Surcharges:** All charges must be pre-approved and referenced within the purchase order or contract. Unapproved charges will not be accepted and will cause the invoice to be rejected and returned. This includes, but is not limited to, surcharges, packing charges, core charges, deposits, and/or any other added costs.

3. **Payment Terms:** Unless otherwise agreed, payment terms are net 30 days on receipt of properly submitted invoice. Any cash discount terms must be shown on the invoice. Unless agreed upon in advance, COD order will not be accepted.

4. **Title and Freight:** All goods will be FOB Destination unless agreed to in advance and such changes shall be shown on the Purchase Order. Freight must be transported as listed on the front of the purchase order. Freight that is prepaid and added to the invoice must be substantiated by attaching to the invoice, original transportation bills receipted to the carrier. No charges for packing, package or drayage will be accepted, except on express agreement to such charges.

5. **Quality:** All material furnished must be the best of their respective kinds. We reserve the right to reject any and all material received which does not conform to our specifications, or, if not so specified, which does not conform to standard specifications. Material received in excess of quantity ordered and/or at higher price than quoted, will not be accepted unless shipment has been authorized by Company. Seller expressly warrants that the goods and/or services shall:
   a. Comply strictly with the provisions of the order and all specifications, drawings, and exhibits referred to in the order or thereafter furnished by Company;
   b. Be new, merchantable, and of the most suitable grade in accordance with the highest industry standards and specifications;
   c. Be fit for Company's intended purposes;
   d. Be in full compliance with all applicable laws, ordinances, regulations, codes, and facility rules, including those relating to safety; and
   e. Be free from any patent, copyright, or trademark claims, infringements or rights of others. All such warranties shall extend for a reasonable time, but in no case less than eighteen (18) months after delivery or twelve (12) months after the start of regular use by Company, whichever occurs first.

6. **Force Majeure:** Neither party shall be liable to the other for any damages for any failure to perform or for any delays or interruptions beyond that party's reasonable control in performing any of its obligations under this Agreement due to acts of God, fires, floods, earthquakes, riots, war, acts of terrorism, civil insurrection, acts of the public enemy, or acts or failures to act of civil or military authority, unless the time to perform is expressly guaranteed. Contractor shall advise Company immediately of any anticipated and actual failure, delay, or interruption and the cause and estimated duration of such event. Any such failure, delay, or interruption, even though existing on the date of this Agreement or on the date of the start of the Work, shall require Contractor to within five (5) days submit a recovery plan detailing the manner in which the failure, delay, or interruption shall be remedied and the revised schedule. Contractor shall diligently proceed with the Work notwithstanding the occurrence thereof. This Article shall apply only to the part of the Work directly affected by the particular failure, delay, or interruption, and shall not apply to the Work as a whole or any other unaffected part thereof.

7. **Indemnification:** The Seller shall be responsible for and shall defend, indemnify, and save harmless Big Rivers Electric Corporation from any and all damage, loss, claim, demand, suit, liability, fine, penalty, or forfeiture of every kind and nature, including professional fees and court costs of defending against the same and payment of any settlement or judgment therefore, by reason of:
    1.) Injuries or deaths to persons
    2.) Damages to or destruction of real, personal, or intangible properties
    3.) Violations of any other rights asserted against Big Rivers Electric Corporation, including patents, trademarks, trade names, copyrights, contract rights, and easements
    4.) Violations of governmental laws, regulations, or orders whether suffered directly by Big Rivers Electric Corporation itself, or indirectly by reason of claims, demands, or suits against it, resulting or alleged to have resulted from acts of omissions of Seller, its employees, agents, business invitees, or other representatives or from their presence on the premises of Big Rivers Electric Corporation, either solely or in occurrence with any alleged joint negligence of Big Rivers Electric Corporation,

    Big Rivers Electric Corporation shall be liable for its sole negligence and to the extent of its concurrent negligence. Indemnification of Big Rivers Electric Corporation includes its officers, employees, and agents.

8. **Warranties:** The Seller warrants that all material on this order conforms to all applicable state and federal laws and regulations with respect to the manufacturer, procurement, sale, and use of such material and Seller agrees to indemnify and save harmless the Company from all claims arising by reason of any violation of said laws or regulations in connection therewith.

    a. It is agreed by the Seller that any right, cause of action, or remedy under the warranties or undertakings assumed or imposed upon the Seller under this order shall extend without exception to the Company or upon whose behalf this order is issued by the Company, as the interest of such company shall appear.

9. **Status of Seller:** The Seller agrees that the relationship established by this order constitutes him an independent contractor, and that no tax, assessment or legal liability of the Seller, or of his agents or employees, becomes by reason of this order an obligation of the Company; Seller further agrees that in the event any sales tax is levied on the sale of any of the material furnished on this order in the state of origin or shipment such sales tax shall be borne by the Seller and that should any use tax be levied or applicable on the use of such material by the Company such tax will be handled by the Company with the taxing authorities in the state of such use and shall not be in any way included in the invoice of the Seller.

10. **Health & Safety:** Seller and Seller's subcontractors are responsible to ensure that their employees comply with Kentucky occupational safety & health laws relating to equipment & operational practices as well as the Company's safety program. Failure to comply with these laws and programs may constitute cause for corrective action ranging from Notice to Correct the unsafe condition or act to removal of personnel from the premises.

11. **Safety:** In the case of entry by the Seller, or of any of the Seller's agents or employees, upon the property or premises of the Company, for the purpose of construction, erection, inspection or delivery under this order, the Seller agrees to provide all necessary and sufficient safeguards and to take all proper precautions, against the occurrence of accidents, injuries or damages to any person or property and to responsible for and to indemnify and save harmless the Company from all loss or damage and any or all claims arising by reason of accidents, injuries or damage to any persons or property in connection with such work, except such as may be the sole and direct result of negligence on the part of the Company, and from all fines, penalties or loss incurred by reason of the violation of any law, regulation, or ordinance; and further agrees to defend at the Seller's expense any and all suits or actions civil or criminal arising out of such claims or matters.

12. **Insurance:** Seller shall furnish certificates of insurance, in the name of the Big Rivers Electric Corporation, evidencing insurance coverage of the following types of minimum amounts:

    a. Workman's compensation and employers liability insurance covering all employees who perform any of

the obligations under the contract or Purchase Order, in the amounts required by law. If any employer or employee is not subject to the workers compensation laws of the governing state, then insurance shall be obtained voluntarily to provide coverage to the same extent as though the employer or employee were subject to such laws.

b. Comprehensive general liability insurance covering all operation under the contract or Purchase Order: bodily injury - $1,000,000 each occurrence and aggregate; property damage - $1,000,000 each occurrence and aggregate. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable. Coverage should include contractual liability, broad form property damage liability, owner's and contractor's protective (independent contractor's) liability, products and completed operations hazard, explosion, collapse, and underground property damage hazard.

Automotive liability insurance on all motor vehicles used in conjunction with the contract or Purchase Order, whether owned, nonowned, or hired; bodily injury - $1,000,000 each person and $1,000,000 each occurrence; property damage $1,000,000 each occurrence. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable.

Certificates evidencing the insurance coverages must be furnished before the commencement of work. The certificates must include a provision that no change in, or cancellation of, any policy listed in the certificates will be made without thirty (30) days written notice to Big Rivers Electric Corporation. If any work to be performed under this contract or Purchase Oder is sublet, the contractor will be required to furnish proof of insurance from all subcontractors evidencing equal to or better coverage.

The Seller shall cause its insurer to waive all subrogation rights against the Company, except with regard to Worker's Compensation, and evidence thereof satisfactory in form and substance to Company shall be exhibited in the Certificate of Insurance. Seller's liability shall not be limited to its insurance coverage. The Company shall be added as an Additional Insured under the Seller's Commercial General Liability, Auto Liability and Excess Liability policies.

13. **Conflict of Interest:** In the event any employee of the Company holds a financial interest in the Seller, whether the Seller is individual, corporate or otherwise, Seller will disclose such interest upon the face of this order. Failure of the Seller to make such disclosure shall relieve this company of any obligations under this purchase order. The company reserves the right to reject any such order at any time after the issuance hereof.

14. **Confidentiality:** The specifications, drawings, designs, manufacturing data and other information transmitted to the Seller by the Company in connection with the performance of this purchase order are the property of the Company and are disclosed in confidence upon the condition that they are not to be reproduced or copied or used for furnishing information or equipment to other, or for any other purpose detrimental to the interest of the Company.

15. **OSHA Compliance:** The Seller warrants that the goods to be furnished hereunder comply with the requirements of the Occupational Safety and Health Act of 1970, as amended.

16. **NAFTA:** Where made aware of it's application by buyer, the Seller warrants that the goods furnished hereunder enable buyer to comply with the REA 'Buy American' clause which requires buyer, to the extent practicable and reasonable, to use in the expenditure of REA funds only unmanufactured articles, materials, and supplies mined or produced in the U.S., Mexico, or Canada and only manufactured articles, materials, and supplies manufactured in the U.S., Mexico, or Canada substantially all from articles, materials, or supplies mined, produced, or manufactured in the U.S., Mexico, or Canada.

17. **Time is of the essence**: If any goods are not delivered or services performed within the specified times, or within a reasonable time if no time is specified, then the Company may terminate the order by notice to the Seller in addition to exercising all other rights and remedies available to the Company under applicable law. All materials and work are subject to the Company's acceptance. Payment shall not constitute acceptance.

18. **Changes to the order:** The Company reserves the right at any time to change the specifications, quantity ordered, and/or delivery date. Such changes may result in adjustments in the price or

delivery schedule in accordance with the pricing and delivery structure of the order.

19. **Termination:** The Company shall have the right at any time with or without cause to terminate the order by written, telegraphic, or electronic notice to the Seller. In case of the Seller's default, the Company shall have all rights and remedies available under applicable law. In no case shall the Company be liable for special, incidental or consequential damages. The Company shall not have any liability for such termination except as follows:
    a. In case of termination of an order for goods specially manufactured for the Company, if the Seller is not in default, then the Company shall be liable for actual costs incurred by the Seller prior to the notice of termination pursuant to the order up to the price of the goods.
    b. In case of termination of an order for services, if the Seller is not in default, the Company shall be liable for payment for services performed prior to the notice of termination.
    c. In case of termination of an order for goods not specially manufactured for the Company, if the Seller is not in default, the Company shall not have any liability for termination of the order. Company shall have the right to return any goods purchased from the Seller as long as such goods have not been specially manufactured for Company and are being stocked by the Seller at the time the Company returns the goods.

20. **EEO Compliance:** To the extent applicable, the Seller shall comply with all of the following Equal Employment Opportunity provisions, which are incorporated herein by reference:
    a. Equal Opportunity regulations set forth in 41CFR 60-1.4(a) and (c) prohibiting discrimination against any employee or applicant for employment because of race, color, religion, sex, or national origin;
    b. Vietnam Era Veterans Readjustment Assistance Act regulations set forth in 41 CFR 60-250.4 relating to the employment and advancement of disabled veterans and veterans of the Vietnam era;
    c. Rehabilitation Act regulations set forth in 41 CFR 60-741.4 relating to the employment and advancement of qualified disabled employees and applicants for employment;
    d. Clause known as "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals" set forth in 15 USC 637(d)(3); and
    e. The subcontracting plan requirements of 15 USC 637(d).

21. **Independent Contractor:** Nothing herein shall be deemed to constitute the Seller, or any of the Sellers' employees or agents, to be the agent, representative or employee of the Company. The Seller shall be an independent contractor and shall have sole responsibility for and control over the details and means of performance.

22. **Assignment:** The Seller shall not assign its rights or obligations hereunder wholly or in part, voluntarily, by operation of law, or otherwise without first obtaining the written consent of the Company. Subject to the foregoing, the provisions hereof shall be binding upon the successors and assigns of the parties hereto.

23. **Governing Law:** The transactions and agreements between the Seller and the Company shall be governed by the subject to the law and jurisdiction of the Commonwealth of Kentucky.

24. **MSDS:** As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200) and certain other Applicable Laws, Contractor or its subcontractors shall provide Material Safety Data Sheets ("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Agreement. Contractor and its subcontractors shall provide Company with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any Applicable Laws in effect at the worksite. **No asbestos or lead containing materials shall be incorporated into any Work performed by Contractor or otherwise left on the Work site without the prior written approval of Company.** Contractor and its subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Agreement is subject to any Applicable Laws.

25. **Sales Tax:** The invoicing regarding this order requires individual totals for labor and materials for the

calculation of Kentucky sales tax & use tax requirement.

Do not bill Kentucky Sales Tax: Blanket Direct Pay Authorization maintained under 103 KAR 31:030, Permit # 108814.

26. **Binding Effect:** This purchase order, together with any written instructions issued hereunder and any attachments hereto, contains the complete and final agreement between the Company and the Seller and any agreement that purports to modify the terms and conditions hereof shall not be binding upon the Company unless made in writing and signed by the Company's authorized representative.

PROPOSAL FOR:

D.B. Wilson DSI Project

SUBMITTED TO:

Big Rivers Electric Corporation

Burns & McDonnell
SINCE 1898

October 2014

Introduction

This Project proposal is to describe engineering services for the dry sorbent injection (DSI) project at Big Rivers Electric Corporation's D.B. Wilson Generating Station (Wilson).

Big Rivers intends to install a DSI system at Wilson to replace the current, temporary DSI system at the plant. The new DSI system at Wilson is to be installed and commence operation no later than April 2016. Prior to the development of this proposed Scope of Work, Burns & McDonnell supported Big Rivers on this project by developing a DSI system specification. Big Rivers recently issued the DSI system specification for bid.

Scope of Work

The tasks for the scope of work described herein include the following engineering efforts:

- Project Management
- Development of Balance of Plant Detailed Design
- Administration of DSI Equipment Specification
- Development and Administration of Controls System Specification
- Development and Administration of Construction Specification
- Pre-Bid Meetings
- Bid Evaluations
- Bid Recommendations

The following paragraphs provide a description of the scope of work for each of the tasks listed above.

Project Team

For the Wilson DSI Project we plan to utilize your team that is working on the Green MATS compliance project. Doing so will allow for us to utilize and capitalize on all lessons learned from the previous project while incorporating plant specific methodologies and preferences at Wilson.

Project Management

Burns & McDonnell's Project Manager will coordinate activities included under this scope of work with Big Rivers. The Project Manager will develop an integrated project schedule including the specification development activities and will provide general oversight and engineering coordination of the Work. Burns & McDonnell's Project Manager will cooperate with Big Rivers' Project Manager in monitoring and expediting, as required, critical project activities.

Weekly Conference Calls with key Big Rivers and Burns & McDonnell project personnel will be conducted to review the status of the project.

Progress reports will be submitted periodically to provide status of the work. Significant project developments, changes, and progress will be reported, as well as upcoming activities planned.

Development of Balance of Plant Detailed Design

Burns & McDonnell will perform the detailed balance of plant design for the Wilson DSI Project, including the following activities:

- **Civil**
    1. Topographic Surveying
        - Prepare and furnish the topographic survey specifications to Big Rivers.

- Prepare and furnish the limits of surveying to Big Rivers.

2. Pilot Trenching
   - Prepare pilot trenching specifications for subsurface investigation.
   - Prepare pilot trenching location map for the scope. If any below grade items are discovered, they will need to be surveyed by Others so that they can be located on the design drawings.
   - Identify pilot trenching results on the design drawings.
   - The pilot trenching will identify below grade obstructions that need to be considered in the final design. The results of the pilot trenching may identify additional unknown below grade interferences that could impact the scope of work for the installation contractor and require additional engineering to relocate the interference.
3. Provide final site general arrangement drawings.
4. Provide technical specifications for bidding and construction of required site civil work.
5. Provide drawings for bid documents and construction of the following:
   - Site finished grading.
   - Surface drainage system in the area of the new work and support facilities.
   - Below grade gravity drain systems as required.
   - Rerouting of storm drains interfering with new work.
   - Final paving (Roads and finished rock surfacing).

- **Controls and Instrumentation**
  1. Provide control logic for the control of all process system components not provided by equipment suppliers.
  2. Provide functional requirements and sketches for operator graphic design for the DCS control interface, where information is not provided by the process system and equipment suppliers.
  3. Provide technical specifications for bidding and construction of the DCS and all required controls and instrumentation work.
  4. Provide an input/output (I/O) list for expansion of the existing distributed control system (DCS) to control all process system not provided by equipment suppliers. Incorporate I/O requirements or list provided by system or equipment suppliers into the DCS I/O List.
  5. Integrate controls requirements provided by equipment suppliers into the plant DCS.
  6. Provide engineering to support the administration of the DCS. Review control system logic and graphic design.
  7. Provide an instrument list of all balance of plant process instruments (excluding vendor provided instruments).
  8. Provide instrument location drawings for all field mounted instruments.
  9. Provide typical installation details for field-mounted devices that are not provided by equipment suppliers.
  10. Provide instrument data sheets for each instrument or control device not furnished with vendor equipment to be provided by the installation contractor.

- **Electrical**
  1. One-line diagrams indicating electrical interfaces to the new DSI system.
  2. The DSI system will be specified such that one power source will be provided to each system and the vendor will distribute power to the systems as required.
  3. Design cables, wiring diagrams, and raceway between the PCM, the silo / equipment, and the Remote I/O DCS cabinet.

4. Provide technical specifications for bidding and construction of the electrical interfaces to the new DSI system. Modify existing drawings as required for proper interface with the existing plant.
5. Provide grounding plans for the new DSI system and the interface to the existing ground grid.
6. Provide schematics or connection diagrams for field wiring designed by Burns & McDonnell. These drawings will be used as the source document for cable numbers.
7. Provide electrical installation details that are considered critical to providing a good installation. Standard construction practices will not be detailed.
8. Provide cable and raceway schedules for power, control and instrument circuits. All conduits will be field routed by the installation Contractor. Grounding is excluded from this requirement.
9. Lighting and convenience power will be specified to be provided and designed by the vendor in the DSI and ACI areas.
10. Plant paging system, in the DSI area, will specified to be provided and designed by the vendor and interface with the existing plant paging system.

- **Mechanical**
  1. Provide piping and instrument diagrams (P&IDs) for all modifications to existing piping systems (service water, compressed air, potable water, drains). P&IDs for the ACI and DSI systems shall be designed and supplied by the equipment suppliers.
  2. Provide an equipment list, line list, specials list and a valve list.
  3. Perform design for all pipes not designed by equipment suppliers including definition of process criteria and detailed routing of all pipe 2-1/2 inch diameter and larger. Piping 2 inches and smaller will be field routed by the Mechanical Construction contractor.
  4. Provide technical specifications for the procurement and installation of piping systems, equipment, specials, and hangers.
  5. Select appropriate piping materials based on Engineer's standard Pipe Specification and Valve Description Documents.
  6. Standard, non-engineered pipe support details will be provided for installing contractor to use for piping erection.

- **Geotechnical / Structural**
  1. Prepare technical guidelines such that Big Rivers can subcontract with a local/regional geotechnical firm to perform the geotechnical investigation. This technical guidelines document will outline requirements for the minimum depth and quantity of soil borings, scope of laboratory testing program, and the extent of geotechnical recommendations to be included in the geotechnical report.
  2. Prepare a site plan drawing of the equipment locations indicating the boring locations. Boring locations will be determined from site topographic survey.
  3. Provide a list of the foundations that the geotechnical firm shall address in the geotechnical report. B&McD will identify the name of the equipment/structure, the location of the foundation, the approximate footprint size and the estimated load or bearing pressure. The geotechnical firm shall utilize this information to determine the type of foundation system they recommend for each piece of equipment/structure based on their boring and test results
  4. Perform structural design for foundations, including rebar. Anchor bolt diameters, projections, and materials will be determined by equipment suppliers.
  5. Perform structural design for structural support steel, platforms, stairs, and ladders not provided by equipment suppliers.

6. Provide technical specification for bidding and construction of the project foundations and structures.
7. Provide construction drawings for bidding and construction of the project foundations and structures.
8. Review the material list, anchor bolt lists, structural steel fabrication drawings, and concrete reinforcement drawings prepared by Contractors.

Development and Administration of Equipment Specifications

Burns & McDonnell has already prepared a DSI mechanical equipment procurement bid document for Wilson for this project.

Burns & McDonnell will prepare a Distributed Controls System (DCS) Modification bid specification to allow control of the DSI equipment with the plants DCS. The document will include general administrative requirements, evaluation criteria, warranty requirements, and technical sections to define the equipment, material and field service requirements.

For each of the specifications listed above, Burns & McDonnell will perform the following:

1. Provide Big Rivers with a list of recommended bidders for each contract. Final bid list will be prepared with input from Big Rivers.
2. Provide technical support during the bid period.
3. Evaluate bids received, attend evaluation / negotiation meetings, if required, and prepare written recommendation to Big Rivers.
4. Conform contract documents and distribute documents to Big Rivers and Contractor for execution.
5. Attend initial coordination conference teleconferences.
6. Perform contract administrations as follows:
    - Review Contractor submittals for compliance with contract requirements and for coordination with information required for other contracts.
    - Maintain communications with Big Rivers concerning the work in the contract.
    - Review contractor schedules for conformance with contract requirements and coordination with other contract schedules. Provide Big Rivers with written review of Contractor progress and performance before release of payment by Big Rivers to Contractor.
    - Establish a monitoring and expediting program adequate for the engineering, manufacturing, and delivery of materials and equipment. Significant dates for each contract shall be recorded in the electronic Project database and continuously monitored.
    - Prepare requests for amendments, review Contractor proposals and make recommendations to Big Rivers.
    - Update contract drawings to conform to construction records and provide one full-size print, one half-size print and drawing files on disk. Final conforming to construction record changes to Engineer's construction contract drawings will be made from one final marked up set of contract drawings submitted by the Contractors. Marked up sets shall be provided within one month after the contract close out date.
    - Closeout contract in accordance with contract procedures specified in the various equipment contracts.

Development and Administration of Construction Specification

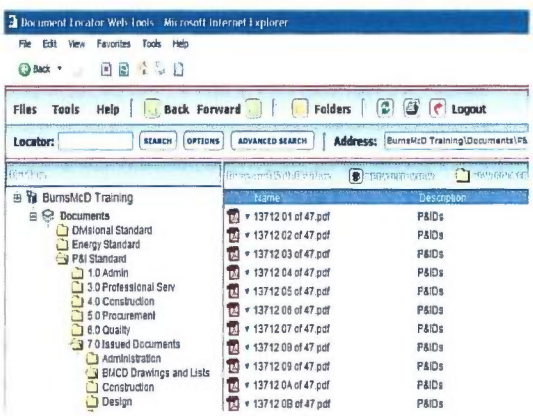
Burns & McDonnell will prepare a construction specification for installation of the DSI project related equipment and associated balance of plant equipment. As a basis of our proposal, Burns & McDonnell has assumed that one construction contract will be issued. Within this contract the construction contractor will be required to receive and install the equipment and materials purchased by equipment contracts in addition to the balance of plant scope of work. Contractor will furnish and install the miscellaneous equipment, piping, and instruments; provide demolition of equipment (if required); and make required modifications to existing equipment based on design drawings and specifications prepared by Burns & McDonnell.

The specification will include general administrative requirements, evaluation criteria and each of the technical sections to define the equipment, material and labor requirements.

In addition to the Project Management tasks described above Burns & McDonnell will perform the following contract administrative tasks in conjunction with the Construction Contract:

- **Contract Administration**
  Big Rivers will issue all purchase orders, contracts, and change orders. Burns &McDonnell will provide assistance to facilitate these activities and additional contract administration to include the following:
  1. Set up a kickoff meeting to establish lines of communication, division of responsibilities, and other administrative procedures. Early technical issues will also be covered at this meeting.
  2. Review, evaluate, and make recommendations regarding equipment and material substitutions and/or change orders.
  3. Assist Big Rivers with change order management as appropriate.
  4. Review contractor submittals for compliance with the contract documents. Compile comments from Burns & McDonnell and Big Rivers on submittals to send to the contractor.
  5. Review contractor's submittal and equipment delivery schedules for compliance with the contract and support of the overall project.
  6. Conduct monthly progress meetings with the contractor and Big Rivers. Meetings will be conducted by phone conference when appropriate.

- **Project Document Management**
  General
  Burns & McDonnell will maintain and manage pertinent drawings and documents for the project, including engineering drawings, specifications, bid documents, and contractor submittals. We will manage all documents through Document Locator, our Document Management System. Drawings will be broken into Classes (P&ID, GA, & Construction Final Design) and Types (Working & Final Design). All drawings shall be developed in AutoCAD and submitted electronically in PDF format (except Final drawings will also be submitted in AutoCAD format).



  Our document management system will track and keep a running log of all submissions, comments, and returns, which will be submitted biweekly for Owner review. Copies of each Operation and Maintenance (O&M) Manual in CD-ROM and paper copies will be provided to Owner.

Document Locator

Burns & McDonnell embraces technology to improve how we do business and to expand the quality of service we offer clients. Our document management system is called Document Locator. By improving the way our project teams collaborate we increase efficiency and make our projects more successful. Strategies we use to bring substantial value to our projects include:

- **Remote Access**: The project team will have secure Web access to information outside the firewall as project teams collaborate on tasks.
- **Security**: You can maintain a historical record of information and actions and establish an audit trail for transactions and approvals.
- **Document Workflow**: Automate your business processes among all project participants with integrated notifications and approvals.

Improved Collaboration and Productivity

Document Locator improves collaboration by allowing you to review and approve documents, designs and communications in real time. Team members can search, retrieve and edit documents as well as include them in approvals and workflow.

Integrated workflow brings the advanced document management required of complex or repeatable business operations. Improved collaboration strengthens accountability and helps maintain control over information by creating an audit trail of communication and documents that focuses and informs the team. Built-in automation capabilities help keep projects on schedule and support productivity gains. Document-centric workflows integrate project information, details, plans and critical steps across project participants.
With Document Locator, version control identifies the most current and approved document. Version history records previous iterations so changes are never lost. Everyone is kept informed through flexible and customizable event subscriptions and notifications.

Interoperability

Document Locator comes with an online 2D viewer and electronic markup tool called Brava. Brava opens over 60 different file formats to increase interoperability among all team members participating in the project. With Brava the project team can quickly review and mark up project drawings. Each individual's markup is saved and stored as a layer while the original file is unchanged.

Anytime-Anywhere Access

Document Locator's WebTools provides secure remote access to information for the project team. With WebTools everyone on the team can collaborate and share from any Internet-accessible location.
WebTools closely replicates the Windows interface in a Web browser. Self-service remote access to document management repositories eliminates the need to ask other team members to retrieve, modify or send files. Authorized users can search, view, save or print any file on demand.

Greater Security and Less Risk

Document Locator's robust and flexible security in a controlled document management system that drives information processes means that deadlines are met, information remains secure and an audit trail is recorded for every transaction and approval. Information is secure and accessible only to those who are authorized.

Field Services (Optional)

Burns & McDonnell will provide field services on an as requested basis. Burns & McDonnell will provide technical engineering support as request by Big Rivers; however, no field services have been included with this proposal.

Site Trips

- Burns & McDonnell has included a site trip to participate with key staff members in the onsite pre-bid meetings at a specified location with the prospective bidders.
- Burns & McDonnell has included in our proposal on site discussions with the low bidders (up to three) prior to recommendation of award.
- One trip for one controls engineer has been included to attend the DCS FAT.

Deliverables

- Project Management Deliverables:
  - Meeting Minutes
  - Progress Reports
- Development of Balance of Plant Detailed Design
- Schedule
  - Level 1 schedule which includes activities for preliminary engineering, permitting, engineering, procurement, and construction.
  - Description of project milestones
- Development and Administration of Equipment Bid Specifications (our proposal assumes Big Rivers commercial front end documents will be used)
- Bid evaluation and recommendation for equipment bid with net present value evaluation
- Development and administration of Construction Specification
- Bid evaluation and recommendation for Construction Contract
- Contract administration

Responsibilities of Big Rivers

In support of the work to be performed under this Scope of Services, Big Rivers shall:

1. Make available any existing geotechnical investigations, site surveys, and exploratory excavations as requested by Burns & McDonnell to support the investigative studies.
2. Assist Burns & McDonnell by placing at their disposal all available information pertinent to the assignment. Burns & McDonnell shall rely on information made available by Big Rivers as accurate without independent verification, unless advised specifically by Big Rivers.
3. Examine preliminary documents that will be presented by Burns & McDonnell and render decisions and comments pertaining thereto prior to preparation of the final documents.
4. Designate a person to act as Big Rivers' representative with respect to the services to be performed under this Scope of services.
5. Give prompt written notice to Burns & McDonnell whenever Big Rivers observes or otherwise becomes aware of any defect in the Project.
6. Provide the applicable code requirements to be included in the bid specifications.

Clarifications and Assumptions

Burns & McDonnell has made the following assumptions related to the above scope of work:

1. Burns & McDonnell scope of work does not include a comprehensive review or upgrade of the existing control systems to make them conform as a whole to current applicable codes or recommended practices.

Burns & McDonnell's modifications to the existing control systems will be limited to making modifications to implement the communication interfaces to the new DSI system. These modifications will be made consistent with the existing system, but do not involve an update or upgrade to the overall existing system to meet current codes or practices.

2. Burns & McDonnell has assumed the existing plant ground grids are adequate and will provide acceptable step and touch potential voltages.
3. Burns & McDonnell has assumed that spare breakers are available in the existing electrical systems to source the new electrical loads associated with the DSI system. Burns & McDonnell has not included any major electrical equipment contracts with this proposal.
4. Burns & McDonnell has assumed that the existing electrical system has adequate spare capacity to support the new electrical equipment associated with the project. Therefore, Burns & McDonnell has not included a load flow or short circuit study.
5. Burns & McDonnell has not included any incidental underground relocation and / or demolition design with this proposal.
6. It is assumed that the existing plant drawings pertinent for the project are available in CAD format and may be used by Burns & McDonnell. Drawings that are not available in CAD format shall be provided in native size .pdf format. Burns & McDonnell will use existing drawings where applicable to illustrate the new construction scope.
7. Burns & McDonnell assumes that all permitting activities are performed by Big Rivers.
8. Burns & McDonnell assumes that fire protection systems and / or studies, if required, will be performed by Others.

Terms and Conditions & Price

Burns & McDonnell proposes to perform the engineering services described within this proposal on the DSI project at D.B. Wilson in accordance with our existing general services agreement with Big Rivers dated April 26, 2010, for a not to exceed fee of $520,000 under the existing pricing schedule agreement.

9400 Ward Parkway
Kansas City, MO 64114
www.burnsmcd.com

Our Mission: Make Our Clients Successful

Engineering, Architecture, Construction, Environmental and Consulting Solutions

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
228843	0	1

SHIP TO:
D. B. Wilson Station
5663 State Route 85 West
Centertown,KY 42328

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR: **BURNS AND MC DONNELL ENGINEERING CO INC**
9400 WARD PARKWAY
KANSAS CITY, MO 64114-3319

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 11363	DELIVER TO	DATE OF ORDER/BUYER 20-NOV-14 Toerne, Robert Frank	REVISED DATE/BUYER Toerne, Robert Frank
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6029 888-268-6219	F.O.B DESTINATION
FREIGHT TERMS PREPAID/ADD		SHIP VIA	VENDOR CONTACT/TELEPHONE (816) 333-9400

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO:
ROB TOERNE - HEADQUARTERS
PHONE (270) 844-6029
FAX (888) 268-6219
EMAIL: ROBERT.TOERNE@BIGRIVERS.COM

Terms: Negotiated Terms on File.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.1	D.B. WILSON DSI PROJECT, (ENGINEERING SERVICES FOR THE DRY SORBENT INJECTION (DSI); SEE PROPOSAL DATED OCTOBER 2014. DELIVER TO:BERTRAM, MARK WAYNE		520000	EACH	$ 1.00	$ 520,000.00

TOTAL $ 520,000.00

Robert F. Toerne

Burns & McDonnell
SINCE 1898

April 10, 2014

Mr. Eric Robeson
Vice President, Environmental Services and Construction
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Big Rivers Electric Corporation
Wilson Station DSI Project
Engineering Services Scope of Work

Dear Mr. Robeson:

Burns & McDonnell received a request from Big Rivers to assist with a dry sorbent injection (DSI) project at Wilson Station. Big Rivers initial request is for Burns & McDonnell to develop a DSI equipment specification to allow for procurement of a permanent storage silo and associated conveying equipment, piping, and associated structural steel.

Scope of Services

The Scope of Services to be provided by Burns & McDonnell includes the following:

Burns & McDonnell will prepare a DSI mechanical equipment procurement bid document for Big Rivers' D.B. Wilson Station. The equipment bid document will be prepared and will be a performance based type specification which leaves the detailed design to the equipment contractor. The document will include general administrative requirements, evaluation criteria, warranty requirements, performance guarantees, liquidated damages and technical sections to define the equipment, material and labor requirements.

The technical section will include the following:

1. Define what equipment is to be provided.
2. Define a minimum level of quality for the equipment to be provided.
3. Define the functional requirements of the equipment and systems to be provided.
4. Describe the interface requirements of the new equipment with existing plant equipment and systems.
5. Specify applicable design codes and standards for the equipment and its installation.
6. Define equipment and material requirements for all items necessary for a complete installation including mechanical, electrical, architectural, civil/structural,

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

arrangement, access and maintenance, metals, coatings, thermal protection, and other definitions to provide for the supply of the DSI equipment.
7. Define requirements for physical modeling or CFD modeling.
8. Define requirements for startup and testing protocol.
9. Burns & McDonnell will provide draft documents to Big Rivers in electronic format to facilitate comment and review.
10. Prepare summary identifying remaining scope and recommending next steps.

Schedule

Burns & McDonnell will perform the project according to a mutually agreeable schedule with Big Rivers. We anticipate submitting a draft DSI equipment specification for Big Rivers review by June 20th, 2014.

Compensation

Burns & McDonnell proposes to perform the Scope of Services described above on a "time and materials" basis, including reimbursement for the cost of expenses incurred, in accordance with the Schedule of Hourly Professional Service Billing Rates currently in place with Big Rivers.

Burns & McDonnell estimates the Scope of Services described above can be performed for $20,000. We will track the engineering budget during the scope of services and report progress to Big Rivers.

Burns & McDonnell will not exceed $20,000 without prior authorization from Big Rivers.

We appreciate the opportunity to serve Big Rivers on this effort. If you have any questions regarding this proposal, please contact me at 816-822-3544, or Scott Strawn at 816-823-7153.

Sincerely,

Rick Halil

Rick Halil, P.E. - Senior Vice President, Energy Division

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

BLANKET PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
224786	1	1

SHIP TO:
201 Third Street
Henderson,KY 42420

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR: **BURNS AND MC DONNELL ENGINEERING CO INC**
9400 WARD PARKWAY
KANSAS CITY, MO 64114-3319

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 11363	DELIVER TO	DATE OF ORDER/BUYER 14-APR-14 Toerne, Robert Frank	REVISED DATE/BUYER 06-MAY-14 Toerne, Robert Frank
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6029 888-268-6219	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA	VENDOR CONTACT/TELEPHONE (816) 333-9400

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

BIG RIVERS CONTACT: ERIC ROBESON, 270.844.6185

Terms: Negotiated Terms on File.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.0	ENGINEERING SERVICES TO REVIEW EXISTING DSI SYSTEM AT WILSON STATION QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO: Rob Toerne - Headquarters PHONE (270) 844-6029 FAX (888) 268-6219 EMAIL: Robert.toerne@bigrivers.com			EACH	$ 20000.00	$

TOTAL $ 20,000.00

Robert F. Toerne

October 2, 2014

Mr. Eric Robeson
Vice President, Environmental Services and Construction
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Big Rivers Electric Corporation
MATS Compliance Project
Engineering Startup Manager Scope of Work

Dear Mr. Robeson:

Burns & McDonnell is pleased to provide startup management services for the MATS Compliance Project at Robert D. Green (Green) Station Units 1 & 2.

Services

The scope of work that is described below is based off of conversations and direction provided by Big Rivers and included the following items:

Startup Manager

- Overall coordination of all project startup activities.
- Communication with plant and construction staff of daily and weekly planned activities.
- Request required resources from the Owner operations and maintenance staffs.
- Coordination with construction contractor of construction completion and assist in Owner review of turnover packages and accepting custody control of each system.
- Assist in managing the LOTO of systems in custody control of startup. Coordinating the LOTO during the custody transfer to Owner.
- Assist in schedule and coordination of Vendor Technical Advisors.
- The startup manager will be onsite starting in November 2014 until through Performance Testing of the MATS system (February 13, 2015).

Burns & McDonnell's Supervisor of Startup Managers will develop the startup plan prior to the field Startup Manager arriving onsite. The pre-planning of activities prior to arrival at site will allow the Startup Manager to begin managing the startup activities immediately as an initial plan will have already been developed.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

Burns & McDonnell proposes to perform these Services on a Time and Material basis in accordance with the Professional Services Agreement dated June 29th, 2010 except as amended as follows.

Add the following paragraph to Article 10:

i) Furnishing of project representatives and performing project site visits to investigate, observe or monitor the project, whether or not during any period when construction or equipment installation is underway, shall not make Contractor responsible for: (a) construction means, methods, techniques, sequences, procedures, or safety precautions and programs in connection with work related to the Work; (b) the failure of any of Company's other contractors or consultants or their respective employees, subcontractors, vendors, or other project participants, not under contract to Contractor, to fulfill contractual responsibilities to Company or to comply with federal, state, or local laws, regulations, and codes; or (c) procuring permits, certificates, and licenses required for any construction. Contractor shall have no authority to direct, control of or stop the work of Company's other contractors or consultants or their respective employees, subcontractors or vendors.

Fee Proposal & Schedule

B&McD proposes to perform the startup management scope of work included herein for an estimated cost including expenses of $180,000.

We appreciate the opportunity to serve Big Rivers on this effort. If you have any questions regarding this proposal, please contact me at 816-822-3544, Jeromy Jones at 816-822-3172 or Scott Strawn at 816-823-7153.

Sincerely,

Rick Halil

Rick Halil, P.E.
Senior Vice President, Energy Division

Jeromy Jones, P.E.
Project Manager

April 10, 2014

Mr. Eric Robeson
Vice President, Environmental Services and Construction
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Big Rivers Electric Corporation
MATS Compliance Project
Engineering Field Services Scope of Work

Dear Mr. Robeson:

Burns & McDonnell is pleased to provide field engineering services for reviewing general field compliance with applicable specifications, construction material, engineering drawings and specifications; answering construction-related questions concerning the material, specifications and drawings provided engineering at Robert D. Green (Green).

Services

The scope of work that is described below is based off of conversations and direction provided by Big Rivers and included the following items:

Structural Field Engineer

- The B&McD field engineer will be onsite for approximately 10 weeks.
- Field Engineer will review Work for compliance with applicable specifications.
- Field Engineer will respond to construction-related questions related to the Work.

Burns & McDonnell proposes to perform these Services on a Time and Material basis in accordance with the Professional Services Agreement dated June 29th, 2010 except as amended as follows.

Add the following paragraph to Article 10:

i) Furnishing of project representatives and performing project site visits to investigate, observe or monitor the project, whether or not during any period when construction or equipment installation is underway, shall not make Contractor responsible for: (a) construction means, methods, techniques, sequences, procedures, or safety precautions and

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

programs in connection with work related to the Work; (b) the failure of any of Company's other contractors or consultants or their respective employees, subcontractors, vendors, or other project participants, not under contract to Contractor, to fulfill contractual responsibilities to Company or to comply with federal, state, or local laws, regulations, and codes; or (c) procuring permits, certificates, and licenses required for any construction. Contractor shall have no authority to direct, control of or stop the work of Company's other contractors or consultants or their respective employees, subcontractors or vendors.

Fee Proposal & Schedule

B&McD proposes to perform the field engineering scope of work included herein for an estimated cost including expenses of $100,000. The proposed field engineering services are scheduled to begin in June, 2014 and finish in August, 2014.

We appreciate the opportunity to serve Big Rivers on this effort. If you have any questions regarding this proposal, please contact me at 816-822-3544, Jeromy Jones at 816-822-3172 or Scott Strawn at 816-823-7153.

Sincerely,

Rick Halil

Rick Halil, P.E.
Senior Vice President, Energy Division

Jeromy Jones, P.E.
Project Manager

Burns & McDonnell
SINCE 1898

July 28, 2014

Mr. Eric Robeson
Vice President, Environmental Services and Construction
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Big Rivers Electric Corporation
MATS Compliance Project
Engineering Field Services Scope of Work

Dear Mr. Robeson:

Burns & McDonnell is pleased to provide field engineering services for reviewing general field compliance with applicable specifications, construction material, engineering drawings and specifications; answering construction-related questions concerning the material, specifications and drawings provided engineering at Robert D. Green (Green).

Services

The scope of work that is described below is based off of conversations and direction provided by Big Rivers and included the following items:

Field Engineer

- The B&McD field engineer will be onsite for approximately 20 weeks.
- Field Engineer will review Work for compliance with applicable specifications.
- Field Engineer will respond to construction-related questions related to the Work.

Burns & McDonnell proposes to perform these Services on a Time and Material basis in accordance with the Professional Services Agreement dated June 29th, 2010 except as amended as follows.

Add the following paragraph to Article 10:

i) Furnishing of project representatives and performing project site visits to investigate, observe or monitor the project, whether or not during any period when construction or equipment installation is underway, shall not make Contractor responsible for: (a) construction means, methods, techniques, sequences, procedures, or safety precautions and

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

programs in connection with work related to the Work; (b) the failure of any of Company's other contractors or consultants or their respective employees, subcontractors, vendors, or other project participants, not under contract to Contractor, to fulfill contractual responsibilities to Company or to comply with federal, state, or local laws, regulations, and codes; or (c) procuring permits, certificates, and licenses required for any construction. Contractor shall have no authority to direct, control of or stop the work of Company's other contractors or consultants or their respective employees, subcontractors or vendors.

Fee Proposal & Schedule

B&McD proposes to perform the field engineering scope of work included herein for an estimated cost including expenses of $200,000. The proposed field engineering services are scheduled to continue from August, 2014 and finish in December, 2014.

We appreciate the opportunity to serve Big Rivers on this effort. If you have any questions regarding this proposal, please contact me at 816-822-3544, Jeromy Jones at 816-822-3172 or Scott Strawn at 816-823-7153.

Sincerely,

Rick Halil

Rick Halil, P.E.
Senior Vice President, Energy Division

Jeromy Jones, P.E.
Project Manager

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

BLANKET PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
224791	4	1

SHIP TO:
201 Third Street
Henderson,KY 42420

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR: **BURNS AND MC DONNELL ENGINEERING CO INC**
9400 WARD PARKWAY
KANSAS CITY, MO 64114-3319

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 11363	DELIVER TO	DATE OF ORDER/BUYER 14-APR-14 Toerne, Robert Frank	REVISED DATE/BUYER 08-OCT-14 Toerne, Robert Frank
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6029 888-268-6219	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA	VENDOR CONTACT/TELEPHONE (816) 333-9400

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

WORK SHALL BE IN ACCORDANCE WITH THE PROFESSIONAL SERVICES AGREEMENT DATED JUNE 29TH, 2010 EXCEPT AS AMENDED BY LETTER DATED APRIL 10, 2014 ADDRESSED TO BIG RIVERS' ROB TOERNE BY BURNS AND MAC'S RICK HALIL IN REFERENCE TO ENGINEERING FIELD SERVICES SCOPE OF WORK.

BIG RIVERS CONTACT: ERIC ROBESON, 270.844.6185

Terms: Negotiated Terms on File.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.0	FIELD ENGINEERING SUPPORT FOR CONSTRUCTION OVERSIGHT AND REVIEW FOR GREEN STATION MATS PROJECT AS PER BURNS AND MAC'S APRIL 10, 2014 PROPOSAL LETTER TO BIG RIVERS INCLUSIVE OF MODIFIED TERMS.			EACH	$ 100000.00	$
2.0	FIELD ENGINEERING SUPPORT FOR CONSTRUCTION OVERSIGHT AND REVIEW FOR GREEN STATION MATS PROJECT AS PER BURNS AND MAC'S JULY 28, 2014 PROPOSAL LETTER TO BIG RIVERS INCLUSIVE OF MODIFIED TERMS.			EACH	$ 200000.00	$
3.0	FIELD ENGINEERING SUPPORT FOR START UP SERVICES FOR GREEN STATION MATS PROJECT AS PER BURNS AND MAC'S OCTOBER 2, 2014 PROPOSAL LETTER TO BIG RIVERS INCLUSIVE OF MODIFIED TERMS.			EACH	$ 180000.00	$

TOTAL $ 480,000.00

Robert F. Toerne

April 10, 2014

Mr. Eric Robeson
Vice President, Environmental Services and Construction
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Big Rivers Electric Corporation
MATS Compliance Project
Engineering Services Scope of Work

Dear Mr. Robeson:

Burns & McDonnell is pleased to provide engineering services related to the performance of a topographic survey, subsurface investigation/pilot trenching and a geotechnical investigation at Robert D. Green (Green) along with the preparation of the associated survey and geotechnical specifications for D.B. Wilson and Kenneth C. Coleman (Coleman) Generating Stations. Burns & McDonnell will also prepare a PCM foundation drawing for Wilson and a blower building foundation drawing for Coleman to enable Big Rivers to start construction at these facilities.

Project

Big Rivers is performing upgrades to Green and preparing for potential modifications at D.B. Wilson and Coleman Stations to add a DSI system and a PAC system. The project includes the installation of foundations for all of the new equipment and structures to be located on the plant site. Because of the location of the proposed equipment is either on fill material, near slopes, or at locations which the plant does not have existing geotechnical data, several subsurface investigations are proposed to collect information that could be used to aid the design of the foundations and other substructures that will be required for the project. A topographic survey and a geotechnical investigation are recommended to be performed to identify the characteristics of the subgrade areas of the plant that will be used for the project.

Big Rivers requested that Burns & McDonnell (B&McD) provide the scope and costs to include the topographic survey and geotechnical consultants in our engineering scope for this project. In addition to the topographic survey and geotechnical investigation, B&McD also recommends performing an underground utilities investigation later in the project after the General Arrangement for the new equipment and new utility routes are determined.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

Services

The scope of work that is described below is based off of conversations and direction provided by Big Rivers and includes the following items:

Site Topographic Survey
Green, Coleman, and Wilson

- Prepare and furnish the topographic survey specifications to Big Rivers.
- Prepare and furnish the limits of surveying area for each plant to Big Rivers.

Green Only

- Big Rivers will compensate, and perform the subcontract administration for this work.
- B&McD will review and comment on the draft survey.
- B&McD will incorporate the topographic survey results for the DSI and ACI project.
- Land surveyor shall be registered in the state of Kentucky.
- Big Rivers shall furnish the existing plant monuments and/or known survey benchmarks for the survey work at each plant.
- The survey will be tied to the existing plant coordinate system where possible.
- Additional surveying may be required later to determine and/or verify the existing structure or utility location, and elevation upon completion of the equipment layout where no existing data is available.

Scope Development for Geotechnical Investigation
Green, Coleman, and Wilson

- Prepare technical guidelines such that Big Rivers can subcontract with a local/regional geotechnical firm to perform the geotechnical investigation. This technical guidelines document will outline requirements for the minimum depth and quantity of soil borings, scope of laboratory testing program, and the extent of geotechnical recommendations to be included in the geotechnical report.
- Prepare a site plan drawing of the equipment locations indicating the boring and pot hole locations. Boring location to be determined from site topographic survey.
- Provide a list of the foundations that the geotechnical investigation shall include in their report. B&McD will also identify the name of the equipment, the location of the foundation, the approximate footprint size and the estimated load or bearing pressure. The geotechnical firm shall utilize this information to determine the type of foundation system they recommend for each piece of equipment based on their boring and test results.

Green Only

- B&McD will perform technical reviews and recommendations; however, Big Rivers will perform contract administration for this work.

Geotechnical Investigation Phase Services

Green Only

- Coordinate with the local/regional geotechnical firm during the course of their geotechnical investigation. This coordination work will include review of boring logs, lab test assignments and results, and general correspondence through the investigation. We will also conduct a review of the draft geotechnical report, and provide comments for incorporation into the final geotechnical report.
- Review and comment on the geotechnical report to confirm the required structural design information has been provided

Design-Phase Services

Green Only

- Provide geotechnical design-phase support services. This will include supporting the design of deep foundation elements (piles) and development of appropriate technical specifications.
- Prepare a Subsurface Information document to be made available to prospective bidders on the project.
- Design the pile layouts and provide drawings and details of the piling systems for both the ACI and DSI silo foundations. The ACI and DSI silos on site are assumed to be identical such that identical foundations can be utilized. Technical specifications will be prepared to furnish and install the piling.
- Review vendor drawings and submittals related to the piling systems.

Construction-Phase Geotechnical Services

Green Only

- Provide a geotechnical engineer on-site to observe installation of deep foundation elements.

Pilot Trenching/Subsurface Investigation

Green Only

- Prepare pilot trenching specifications for subsurface investigation.
- Prepare pilot trenching location map for the scope. If any below grade items are discovered, they will need to be surveyed by Others so that we can locate them on our drawing.

- Identify pilot trenching results on the design drawings.
- The pilot trenching will identify below grade obstructions that need to be considered in the final design. The results of the pilot trenching may identify additional unknown below grade interferences that could impact the scope of work for the installation contractor and require additional engineering to relocate the interference.

Fee Proposal & Schedule

B&McD proposes to perform the engineering scope of work included herein for an estimated cost including expenses of $200,000. Cost for the subcontracted geotechnical and surveying consultants are not included in the estimated fee above as these Contracts will be awarded by Big Rivers.

B&McD is prepared to commence work on this scope for Big Rivers. The technical guidelines have already been made available to Big Rivers. The site survey will be performed first as the information obtained will be used to aid in defining the scope of the geotechnical investigation.

We appreciate the opportunity to serve Big Rivers on this effort. If you have any questions regarding this proposal, please contact me at 816-822-3544, Jeromy Jones at 816-822-3172 or Scott Strawn at 816-823-7153.

Sincerely,

Rick Halil

Rick Halil, P.E.
Senior Vice President, Energy Division

Jeromy Jones, P.E.
Project Manager

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

BLANKET PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
224787	1	1

SHIP TO:
201 Third Street
Henderson,KY 42420

BILL TO:
201 Third Street
Henderson,KY 42420

VENDOR: **BURNS AND MC DONNELL ENGINEERING CO INC**
9400 WARD PARKWAY
KANSAS CITY, MO 64114-3319

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO 11363	DELIVER TO	DATE OF ORDER/BUYER 14-APR-14 Toerne, Robert Frank	REVISED DATE/BUYER 06-MAY-14 Toerne, Robert Frank
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6029 888-268-6219	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA	VENDOR CONTACT/TELEPHONE (816) 333-9400

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

BIG RIVERS CONTACT: ERIC ROBESON, 270.844.6185

Terms: Negotiated Terms on File.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.0	CIVIL ENGINEERING SERVICES TO DEVELOP SITE SURVEY, GEOTECHNICAL INVESTIGATION, PILOT TRENCHING, PILING DESIGN, AND RETAINING WALL DESIGN FOR GREEN STATION MATS PROJECT			EACH	$ 200000.00	$

TOTAL $ 200,000.00

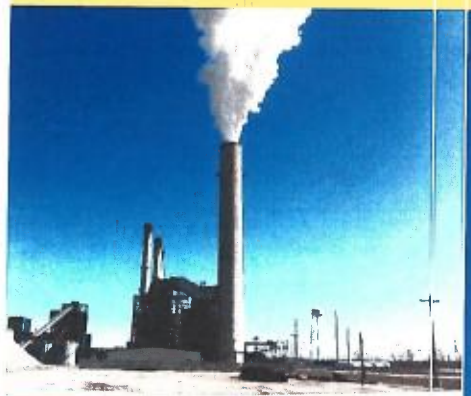
Robert F. Toerne

Burns & McDonnell
SINCE 1898

PSMJ's PREMIER AWARD FOR CLIENT SATISFACTION 2010

Proposal to Provide Engineering Services for the MATS Compliance Project

Submitted to: Big Rivers Electric Corporation
Submitted by: Burns & McDonnell
May 2013



Big Rivers ELECTRIC CORPORATION

May 13, 2013

Rob Toerne
Director, Supply Chain
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY42419

Re: Proposal for Engineering Services for the MATS Compliance Project

Dear Mr. Toerne and Members of the Evaluation Team:

On behalf of the Burns & McDonnell Team and our 4,000+ Employee-Owners, we are pleased to present our proposal to provide engineering services to develop equipment specifications, detailed balance of plant design, and construction specification development and administration for the fleet to comply with the EPA's (Mercury Air Toxins Standards) MATS regulations.

We have assembled a team tailored for this assignment and cannot wait for the opportunity to work successfully with Big Rivers once again. Our goal, as you now know, is to exceed our Clients' expectations and we will do everything in our power to do so on each and every assignment.

Thank you for this opportunity. If you have any questions please call Scott Strawn at (816) 823-7153, or myself at (816) 822-3544.

Very Truly Yours,

Rick Halil, P.E.
Senior Vice President

cc: Scott Strawn, P.E.

Table of Contents

MATS Compliance Project

1.0 PROJECT APPROACH

Introduction

Over the past year Big Rivers has been developing a strategy comply with the EPA's Mercury and Air Toxics Standards (MATS). As such, this project proposal describes services for the installation of dry sorbent injection (DSI) and activated carbon injection (ACI) equipment for Big Rivers Electric Corporation's D.B. Wilson Generating Station (D.B. Wilson), Kenneth C. Coleman Generating Station Units 1, 2, and 3 (Coleman), and Robert D. Green Units 1 and 2 (Green). Scope of work includes development of equipment specifications for the DSI/ACI equipment, balance of plant detailed design, development of a comprehensive construction specification and Owner's Engineering services throughout the project (all described herein).

The new systems at each generating station are to be installed and commence operation no later than April 2015.

Scope of Work

The tasks for the scope of work described herein include the following engineering efforts:

- Project Management
- Initial Coordination Meeting
- Development of Conceptual Design
- Development of Balance of Plant Detailed Design
- Development and Administration of MATS Equipment Specification and Controls System Specification
- Development and Administration of Construction Specification
- Pre-Bid Meetings
- Bid Evaluations
- Bid Recommendations

The following paragraphs provide a description of the scope of work for each of the tasks listed above.

Project Management

Burns & McDonnell's Project Manager will coordinate activities included under this scope of work with Big Rivers. The Project Manager will develop an integrated project schedule including the specification development activities and will provide general oversight and engineering coordination of the Work. Burns & McDonnell's Project Manager will cooperate with Big Rivers' Project Manager in monitoring and expediting, as required, critical project activities.

Weekly Conference Calls with key Big Rivers and Burns & McDonnell project personnel will be conducted to review the status of the project. Weekly conference calls are assumed to be one hour per week.

Monthly progress reports will be submitted to provide status of the work. Significant project developments, changes, and progress will be reported, as well as activities planned for the following month.

Initial Coordination Meeting

Key members of the Burns & McDonnell project team will meet with Big Rivers' personnel to review project scope, confirm official and unofficial communications protocol, discuss specification information requirements, and conduct a general project discussion. This meeting will include a discussion of existing plant infrastructure, and a tour of relevant facilities.

Prior to this meeting, Burns & McDonnell will provide Big Rivers with a list of existing unit and site information requirements.

Other items to be discussed at the meeting include:

- Scheduled unit outage dates, if required.
- Schedule for the project development work, including any studies.
- Information needed for the Design Basis at each plant.
- General design criteria
  - Layout preferences and constraints
  - Maintenance access constraints
  - Operating constraints
  - Equipment and controls redundancy

Development of Conceptual Design

Based on the initial coordination meeting and the site visits, Burns & McDonnell will develop the following conceptual design drawings for each generating station: preliminary general arrangements, process flow diagrams, and electrical one line diagrams. Burns & McDonnell will issue the conceptual design drawings to Big Rivers for approval. Once the conceptual design information is approved by Big Rivers, Burns & McDonnell will utilize the information in development of the technical equipment specifications.

In addition to the conceptual drawings, the design basis for each generating station must be developed. Below is a listing of general considerations for developing the design basis.

- **Design Basis Development**
  One of the first tasks to be completed will be to establish the Design Basis. The Design Basis will establish maximum flue gas flow, uncontrolled and controlled emissions, water and material/reagent usages, etc. for each generating station. Design basis will be based on expected fuels and unit operating conditions, performance requirements including pollutant emissions criteria, existing services, disposal requirements, all as provided by Big Rivers. The Design Basis will be summarized in a memo and will be the basis for the subsequent plant design and specifications for equipment and systems. In summary, the design basis includes establishing the following:
    - Baseline Boiler Performance (by field testing if required)
    - Design coal analysis and range
    - Design plant output and coal burn rate
    - Flue gas flow rate and analysis
    - Emission limits for air pollutants
    - Material Balances (if applicable)
    - Water Balances (if applicable)
    - Equipment performance and efficiency requirements to meet Big Rivers' desired performance, applicable permit provisions, and determining site specific design criteria.
    - Ambient design conditions for both equipment and HVAC design (if applicable)
    - Auxiliary electrical system design parameters for high voltage, medium voltage, and low voltage systems

  Burns & McDonnell recommends a conference call with Big Rivers to review the Design Basis for the specifications.

- **Budgetary Cost Estimate**
  Burns & McDonnell will develop a budgetary cost estimate for the MATS project and will breakout project costs for each facility. The estimate will utilize the equipment cost information from the successful DSI/ACI bidder in addition to in-house estimates for the installation of that equipment. All economic assumptions used in the development of the estimate will be provided to Big Rivers.

- **Shared Facilities and Sparing Philosophy Development**
  - Burns & McDonnell will review areas where the utilities existing at the plant could be used to support the DSI and ACI systems. This will include service water supply (if applicable), compressed air, communication systems, and maintenance facilities. Existing system interfaces will be determined for those systems that appear to be candidates for sharing with the new equipment.
  - Determine the plant utility tie-in locations for process water (i.e., for eye wash stations, if applicable) and any other plant tie-ins that may be required to operate a fully functioning system.

Development of Balance of Plant Detailed Design

Burns & McDonnell will perform the detailed balance of plant design for the Big Rivers MATS Compliance Project, including the following activities:

- **Civil**
  - Provide final site general arrangement drawings based on plant layout work performed during the Phase 1 engineering.
  - Provide technical specifications for bidding and construction of required site civil work.
  - Provide drawings for bid documents and construction of the following:
    - Roads and finished rock surfacing.
    - Site finished grading.
    - Surface drainage system in the area of the new work and support facilities.
    - Below grade gravity drain systems as required.
    - Rerouting of storm drains interfering with new work.
    - Final paving.

- **Controls and Instrumentation**
  - Provide control logic for the control of all process system components not provided by equipment suppliers.
  - Provide functional requirements and sketches for operator graphic design for the DCS control interface, where information is not provided by the process system and equipment suppliers.
  - Provide technical specifications for bidding and construction of the DCS and all required controls and instrumentation work.
  - Provide an input/output (I/O) list for expansion of the existing distributed control system (DCS) to control all process system not provided by equipment suppliers. Incorporate I/O requirements or list provided by system or equipment suppliers into the DCS I/O List.
  - Integrate controls requirements provided by equipment suppliers into the plant DCS.
  - Provide engineering to support the administration of the DCS. Review control system logic and graphic design.
  - Provide an instrument list of all balance of plant process instruments (excluding vendor provided instruments).
  - Provide instrument location drawings for all field mounted instruments.

- Provide typical installation details for field-mounted devices that are not provided by equipment suppliers.
- Provide instrument data sheets for each instrument or control device not furnished with vendor equipment to be provided by the installation contractor.

- **Electrical**
  - One-line diagrams indicating electrical interfaces to the new ACI and DSI systems.
  - The ACI and DSI systems will be specified such that one power source will be provided to each system and the vendor will distribute power to the systems as required.
  - Provide technical specifications for bidding and construction of the electrical interfaces to the new ACI and DSI systems. Modify existing drawings as required for proper interface with the existing plant.
  - Provide grounding plans for the new ACI and DSI systems and the interface to the existing ground grid.
  - Provide schematics or connection diagrams for field wiring designed by Burns & McDonnell. These drawings will be used as the source document for cable numbers.
  - Provide electrical installation details that are considered critical to providing a good installation. Standard construction practices will not be detailed.
  - Provide cable and raceway schedules for power, control and instrument circuits. All conduits will be field routed by the installation Contractor. Grounding is excluded from this requirement.
  - Lighting and convenience power will be specified to be provided and designed by the vendor in the DSI and ACI areas.
  - Plant paging system, in the ACI and DSI areas, will specified to be provided and designed by the vendor and interface with the existing plant paging system.

- **Mechanical**
  - Provide piping and instrument diagrams (P&IDs) for all modifications to existing piping systems (service water, compressed air, potable water, drains). P&IDs for the ACI and DSI systems shall be designed and supplied by the equipment suppliers.
  - Provide an equipment list, line list, specials list and a valve list.
  - Perform design for all pipes not designed by equipment suppliers including definition of process criteria and detailed routing of all pipe 2-1/2 inch diameter and larger. Piping 2 inches and smaller will be field routed by the Mechanical Construction contractor.
  - Provide technical specifications for the procurement and installation of piping systems, equipment, specials, and hangers.
  - Select appropriate piping materials based on Engineer's standard Pipe Specification and Valve Description Documents.
  - Standard, non-engineered pipe support details will be provided for installing contractor to use for piping erection.

- **Structural**
  - Perform structural design for foundations, including rebar. Anchor bolts will be sized by equipment suppliers.
  - Perform structural design for structural support steel, platforms, stairs, and ladders not provided by equipment suppliers.
  - Perform structural design for ductwork and expansion joints not provided by equipment suppliers.

- Provide technical specification for bidding and construction of the project foundations and structures.
- Provide construction drawings for bidding and construction of the project foundations and structures.
- Review the material list, anchor bolt lists, structural steel fabrication drawings, and concrete reinforcement drawings prepared by Contractors.
- For pre-engineered structures, the supplier will provide the detailed design. For these buildings the Engineer's structural engineering services will be limited to:
  - Provision of technical specifications.
  - General arrangement drawings.
  - Foundation design.
  - Ground floor slabs and equipment foundations for equipment at grade.
  - Layout and specification of interior partitions.
  - Review of shop drawings.

Development and Administration of Equipment Specifications

Burns & McDonnell will prepare one MATS mechanical equipment procurement bid document for Big Rivers' D.B. Wilson, Coleman, and Green Stations. The equipment bid document will be prepared and will be a performance based type specification which leaves the detailed design to the equipment contractor. The document will include general administrative requirements, evaluation criteria, warranty requirements, performance guarantees, liquidated damages and technical sections to define the equipment, material and labor requirements.

The technical section will include the following:

- Define what equipment is to be provided.
- Define a minimum level of quality for the equipment to be provided.
- Define the functional requirements of the equipment and systems to be provided.
- Describe the interface requirements of the new equipment with existing plant equipment and systems.
- Specify applicable design codes and standards for the equipment and its installation.
- Define equipment and material requirements for all items necessary for a complete installation including mechanical, electrical, architectural, civil/structural, arrangement, access and maintenance, metals, coatings, thermal protection, and other definitions to provide for the supply of the DSI and ACI equipment.
- Define requirements for physical modeling or CFD modeling.
- Define requirements for startup and testing protocol.
- Define performance test methods.
- Burns & McDonnell will provide draft documents to Big Rivers in electronic format to facilitate comment and review.
- Burns & McDonnell will prepare contract addenda as required to address bidder questions.
- Burns & McDonnell will perform a technical bid evaluation on the basis of capital costs and O&M cost, both fixed and variable, and will include these results in the recommendation of award.
- Evaluation of existing structural steel, ductwork, platforms, etc for new loads, design of new or modifications to existing structural steel, ductwork, platforms, etc. and design of modifications to existing foundations is not included in this proposal. Design of new foundations is not included, except where specifically indicated otherwise herein.

Burns & McDonnell will prepare a Distributed Controls System (DCS) Modification bid Specification to allow the MATS equipment Programmable Logic Controllers (PLCs) to communicate with the plants DCS. The

document will include general administrative requirements, evaluation criteria, warranty requirements, and technical sections to define the equipment, material and field service requirements.

For each of the specifications to be developed above, Burns & McDonnell will provide Big Rivers with the following:

- Provide Big Rivers with a list of recommended bidders for each contract. Final bid list will be prepared with input from Big Rivers.
- Provide technical support during the bid period.
- Evaluate bids received, attend evaluation / negotiation meetings, if required, and prepare written recommendation to Big Rivers.
- Conform contract documents and distribute documents to Big Rivers and Contractor for execution.
- Attend initial coordination conference teleconferences.
- Perform contract administrations as follows:
  - Review Contractor submittals for compliance with contract requirements and for coordination with information required for other contracts.
  - Maintain communications with Big Rivers concerning the work in the contract.
  - Review contractor schedules for conformance with contract requirements and coordination with other contract schedules. Provide Big Rivers with written review of Contractor progress and performance before release of payment by Big Rivers to Contractor.
  - Review OEM performance test procedures for compliance with specified performance testing methods.
  - Establish a monitoring and expediting program adequate for the engineering, manufacturing, and delivery of materials and equipment. Significant dates for each contract shall be recorded in the electronic Project database and continuously monitored.
  - Prepare requests for amendments, review Contractor proposals and make recommendations to Big Rivers.
  - Update contract drawings to conform to construction records and provide 1 full-size print, 1 half-size print and drawing files on disk. Final conforming to construction record changes to Engineer's construction contract drawings will be made from one final marked up set of contract drawings submitted by the Contractors. Marked up sets shall be provided within one month after the contract close out date.
  - Closeout contract in accordance with contract procedures specified in the various equipment contracts.

Development and Administration of Construction Specification

Burns & McDonnell will prepare a construction specification for installation of the MATS project related equipment and associated balance of plant equipment. As a basis of our proposal, Burns & McDonnell has assumed that one construction contract will be issued. Within this contract the construction contractor will be required to receive and install the equipment and materials purchased by equipment contracts in addition to the balance of plant scope of work. Contractor would furnish and install the miscellaneous equipment, piping, and instruments; provide demolition of equipment (if required); and make required modifications to existing equipment based on design drawings and specifications prepared by Burns & McDonnell.

The specification will include general administrative requirements, evaluation criteria and each of the technical sections to define the equipment, material and labor requirements.

In addition to the Project Management tasks described above Burns & McDonnell will perform the following contract administrative tasks in conjunction with the Construction Contract:

- **Contract Administration**
  Big Rivers will issue all purchase orders, contracts, and change orders. Burns &McDonnell will provide assistance to facilitate these activities and additional contract administration for each contract to include the following:
  - Set up a kickoff meeting to establish lines of communication, division of responsibilities, and other administrative procedures. Early technical issues are also covered at this meeting.
  - Review, evaluate, and make recommendations regarding equipment and material substitutions and/or change orders.
  - Assist Big Rivers with change order management as appropriate.
  - Review contractor submittals for compliance with the contract documents. Compile comments from Burns & McDonnell and Big Rivers on submittals to send to the contractor.
  - Review contractor's submittal and equipment delivery schedules for compliance with the contract and support of the overall project.
  - Conduct monthly progress meetings with the contractor and Big Rivers. Meetings will be conducted by phone conference when appropriate.

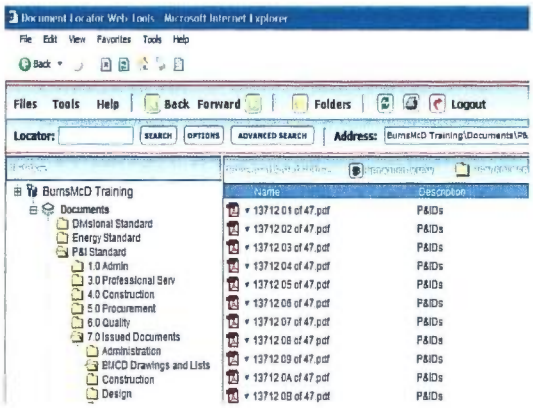
- **Project Document Management**
  General
  Burns & McDonnell will maintain and manage pertinent drawings and documents for the project, including engineering drawings, specifications, bid documents, and contractor submittals. We will manage all documents through Document Locator, our Document Management System. Drawings will be broken into Classes (P&ID, GA, & Construction Final Design) and Types (Working & Final Design). All drawings shall be developed in AutoCAD and submitted electronically in PDF format (except Final drawings will also be submitted in AutoCAD format). Our document management system will track and keep a running log of all submissions, comments, and returns, which will be submitted biweekly for Owner review. Copies of each Operation and Maintenance (O&M) Manual in CD-ROM and paper copies will be provided to Owner.

  Document Locator
  Burns & McDonnell embraces technology to improve how we do business and to expand the quality of service we offer clients. Our document management system is called Document Locator. By improving the way our project teams collaborate we increase efficiency and make our projects more successful. Strategies we use to bring substantial value to our projects include:

  - **Remote Access**: The project team will have secure Web access to information outside the firewall as project teams collaborate on tasks.
  - **Security**: You can maintain a historical record of information and actions and establish an audit trail for transactions and approvals.
  - **Document Workflow**: Automate your business processes among all project participants with integrated notifications and approvals.

Improved Collaboration and Productivity

Document Locator improves collaboration by allowing you to review and approve documents, designs and communications in real time. Team members can search, retrieve and edit documents as well as include them in approvals and workflow.



Integrated workflow brings the advanced document management required of complex or repeatable business operations. Improved collaboration strengthens accountability and helps maintain control over information by creating an audit trail of communication and documents that focuses and informs the team. Built-in automation capabilities help keep projects on schedule and support productivity gains. Document-centric workflows integrate project information, details, plans and critical steps across project participants.

With Document Locator, version control identifies the most current and approved document. Version history records previous iterations so changes are never lost. Everyone is kept informed through flexible and customizable event subscriptions and notifications.

Interoperability

Document Locator comes with an online 2D viewer and electronic markup tool called Brava. Brava opens over 60 different file formats to increase interoperability among all team members participating in the project.

With Brava the project team can quickly review and mark up project drawings. Each individual's markup is saved and stored as a layer while the original file is unchanged.

Anytime-Anywhere Access

Document Locator's WebTools provides secure remote access to information for the project team. With WebTools everyone on the team can collaborate and share from any Internet-accessible location. WebTools closely replicates the Windows interface in a Web browser. Self-service remote access to document management repositories eliminates the need to ask other team members to retrieve, modify or send files. Authorized users can search, view, save or print any file on demand.

Greater Security and Less Risk

Document Locator's robust and flexible security in a controlled document management system that drives information processes means that deadlines are met, information remains secure and an audit trail is recorded for every transaction and approval. Information is secure and accessible only to those who are authorized.

Field Services (Optional)

Burns & McDonnell will provide field services on an as requested basis. Based on our experience on previous similar projects, the scope of the field services could include the following:

- Assist Big Rivers in the resolution of interferences and discrepancies discovered during construction.
- Construction and startup oversight to ensure proper installation, testing, and checkout are completed.
- Review and comment on the contractors' performance testing for systems and equipment.

Burns & McDonnell will provide technical engineering support as request by Big Rivers; however, no field services have been included with this proposal.

Site Trips

- Burns & McDonnell has included one site trip for collection of reference documents, site specific information and other necessary support data for preparation of the bid documents. We have included costs for a single trip for four individuals for a total of two days.
- Burns & McDonnell has included a site trip to participate with key staff members in the onsite pre-bid meetings at a specified location with the prospective bidders. We have included costs for a four trips for three individuals for a total of two days.
- Burns & McDonnell has included in our proposal on site discussions with the low bidders (up to three) prior to recommendation of award. We have included costs for four trips for three individuals for a total of four days.
- One trip for one controls engineer has been included for each plant for the vendor PLC factory acceptance testing.
- One trip for one controls engineer has been included for each plant for the vendor design review meeting.

Deliverables

- Project Management Deliverables:
  - Meeting Minutes
  - Monthly Meeting Minutes
  - Monthly Progress Reports
  - Project Development Schedule
- Initial Coordination Conference Meeting Minutes
- Conceptual Design Drawings
  - General Arrangement Drawings
  - Process Flow Diagrams
  - One line Diagrams
- Development of Balance of Plant Detailed Design
- Design Basis Document
- Budgetary Cost Estimate (Capital)
- Schedule
  - Level 1 schedule which includes activities for preliminary engineering, permitting, engineering, procurement, and construction.
  - Describe project milestones
- Development and Administration of Equipment Bid Specifications (proposal assumes Big Rivers commercial front end documents will be used)
- Bid evaluation and recommendation for equipment bid with net present value evaluation
- Development and administration of Construction Specification
- Bid evaluation and recommendation for Construction Contract
- Contract administration

Project Execution Plan

The project execution plan critical path activities are presented below. Most of the activities will be performed to support development of the Equipment Bid Specifications.

SCHEDULE MILESTONES:

May 17, 2013	Notice to proceed (NTP)
May 24, 2013	Kick-off meeting / Site Visit
June 28, 2013	Design Basis and GA Issued to Big Rivers for review and approval
July 19, 2013	Design Basis and GA complete
August 16, 2013	Equipment Bid Specification to Big Rivers for review
September 13, 2013	Equipment Bid Specification Ready for Bid
October 22, 2013	MATS Equipment Bids Due
November 5, 2013	MATS Equipment Bid Negotiations
November 12, 2013	Bid Recommendation
November 22, 2013	MATS Equipment Contract Award
November 25, 2013	Begin Balance of Plant Design and Other Equipment Specifications
February 21, 2014	Construction Specification to Big Rivers for Review
March 7, 2014	Construction Specification Ready for Bid
April 25, 2014	Construction Specification Bids Due
May 5, 2014	Construction Contract Bid Negotiations
May 20, 2014	Bid Recommendation
May 26, 2014	Construction Contract Award
June 2014 – Dec 2014	Construction Contract Administration
Jan 2015 – March 2015	Start-Up and Commissioning

Responsibilities of Big Rivers

In support of the work to be performed under this Scope of Services, Big Rivers shall provide the following:

- Make available any existing geotechnical investigations, site surveys, and exploratory excavations as requested by Burns & McDonnell to support the investigative studies.
- Assist Burns & McDonnell by placing at their disposal all available information pertinent to the assignment. Burns & McDonnell shall rely on information made available by Big Rivers as accurate without independent verification, unless advised specifically by Big Rivers.
- Examine preliminary documents that will be presented by Burns & McDonnell and render decisions and comments pertaining thereto prior to preparation of the final documents.
- Designate a person to act as Big Rivers' representative with respect to the services to be performed under this Scope of services.
- Give prompt written notice to Burns & McDonnell whenever Big Rivers observes or otherwise becomes aware of any defect in the Work.
- Provide the applicable code requirements for each of the three projects sites to be included in the bid specifications.

2.0 PROJECT TEAM

Project Team

MATS Compliance Project Team

Big Rivers ELECTRIC CORPORATION

- **Client Manager** — Scott Strawn, P.E.
- **Project Manager** — Jeromy Jones, P.E.
- **Officer-In-Charge** — Rick Halil, P.E.
- **Engineering Manager / Process** — Sam Yoder
  - **Electrical** — David Bross
  - **Mechanical** — Drew Hofrichter, P.E.
  - **Structural** — Mike McMahon, P.E.
  - **I & C** — Ryan Baumgardner
  - **Process Consultant** — Carl Weilert, P.E.
  - **Civil** — Willie Goh, P.E.

Jeromy K. Jones, P.E.

Project Manager

Expertise

- Air Quality Control Systems
- Water / Wastewater Treatment

Education

- B.S. in Chemical Engineering, University of Missouri – Rolla, 2002

Registration

- Registered Professional Engineer – Missouri

Total Years of Experience

10 years

Years With Burns & McDonnell

10 years

Start Date

2002

Mr. Jones works on projects involving air pollution regulations and control technologies. His air quality experience includes projects that entail design, construction and start-up phases of major new and retrofit work at power plants. Mr. Jones' work also includes completing feasibility assessments and cost estimates for air pollution control technologies for the control of SO_2, NO_X, particulate, sulfuric acid mist, and mercury emissions. He has been involved in multi-pollutant control studies evaluating potential future regulatory scenarios, and the costs and feasibility of compliance with these scenarios.

St. Johns River Power Park, JEA

Jacksonville, FL, 2012 - present

Process troubleshooting and evaluation of existing double loop wet limestone FGD systems for two 640 MW coal-fired unit firing bituminous coal to determine modifications required for MATS compliance.

D.B. Wilson, Big Rivers

Centertown, KY, 2012 - present

Assistant Project Manager for the design and development of wet limestone FGD system specification for a 440 MW coal-fired unit firing a blend of bituminous coal and petcoke.

HMP&L Station Two, Big Rivers

Robards, KY, 2012 - present

Assistant Project Manager for the evaluation of potential upgrades to the booster fans and wet limestone FGD systems on two 200 MW coal-fired units firing a blend of bituminous coal and petcoke.

Boswell Energy Center, Minnesota Power

Cohasset, MN, 2011 - present

Process consultant for retrofit of circulating dry scrubber (CDS) and pulse-jet fabric filter (PJFF) to 525 MW unit firing PRB coal.

Lansing Unit 4, Alliant Energy

Lansing, IA, 2011- present

Project air pollution control consultant for retrofit of circulating dry scrubber (CDS) for PRB coal-fired 256 MW Unit.

Cooper Station Unit 2, East Kentucky Power Cooperative

Burnside, KY, 2008-2012

Mr. Jones was the Lead Mechanical Engineer and the Lead Process Engineer for the Cooper Unit 2 environmental project. The project involves the addition of an FGD, pulse jet baghouse, SCR, ash handling system, new air heater, new PA fans, new FD fans, and new ID fans to Cooper Station Unit 2, which is a 225 MW coal-fired unit. Mr. Jones was responsible for system design and equipment integration, preparing equipment specifications, preparing construction specifications, overseeing the mechanical construction contract, and managing of the mechanical and process engineering team.

Hugo Station Unit 1, Western Farmers Electric Cooperative

Hugo, OK, 2008-2009

Mr. Jones was the Project Manager for the Hugo Unit 1 mercury control project. The project entailed performing a technology assessment, writing specifications and

evaluating bids, and assisting in managing the construction and commissioning of the equipment.

Cholla Power Station Unit 3, Arizona Public Service
Joseph City, AZ, 2006-2009

Mr. Jones was the Engineering Manager for the Cholla Unit 3 scrubber and baghouse retrofit project for Arizona Public Service. The project involved the addition of a wet flue gas desulfurization (WFGD) system and the replacement of the existing hot side electrostatic precipitators (ESP) with a pulse jet baghouse for Cholla Power Station Unit 3. The Unit 4 ESP, which was abandoned on a Unit 4 project, was converted into the Unit 3 pulse jet baghouse and the ash system was modified accordingly. This project was performed on an Engineering, Procurement and Construction (EPC) contract basis. Mr. Jones was responsible for coordinating and directing the detailed engineering activities for this project as well as overseeing the baghouse and scrubber contracts.

Cholla Power Station Unit 4, Arizona Public Service
Joseph City, AZ, 2006-2009

Mr. Jones served as the Lead Process Engineer for the Cholla Unit 4 scrubber and baghouse retrofit project for Arizona Public Service. The project involved the addition of a wet flue gas desulfurization (WFGD) system and the replacement of the existing hot side electrostatic precipitators with a baghouse for Cholla Power Station Unit 4. The project also included providing a new ash handling system and additional capacity to the existing reagent preparation system that serves all four Units at the Cholla Power Station. This project was performed on an Engineering, Procurement and Construction (EPC) contract basis. Mr. Jones was responsible for the design of the reagent preparation system and was the contract engineer for the baghouse and the scrubber contracts.

Huntington Power Plant Unit 2 FGD Retrofit, Pacificorp
Huntington, UT, 2005-2007

Mr. Jones served as the Lead Process Engineer for a FGD retrofit and precipitator to a pulse jet baghouse conversion at an existing 475-MW coal-fired power plant. The project also included provisions for future mercury control in the design. Mr. Jones's duties included contract administration, controls implementation, start-up assistance, and assisted with project closeout. Mr. Jones spent several months onsite helping to coordinate equipment installation and oversight of equipment startup and commissioning activities.

Technical Feasibility Analysis, Confidential Client
2003-2004

Mr. Jones aided in the preparation of a technical feasibility analysis of five separate control technologies for the air pollution control retrofit of seven coal-fired units, approximately 2,300 MW. The study was performed in response to a USA EPA enforcement action on the electric utility. Mr. Jones was responsible for developing capital and operating costs for each technology including the layout of each system.

Multi-Pollutant Control Technology Study, EPRI
2004-2005

Mr. Jones evaluated the reliability of Powerspan's Electro-Catalytic Oxidation (ECO) technology and determined the system availability in order to identify the redundancy required to ensure the ECO technology reliability is similar to other proven systems.

Big Stone II, Otter Tail Power
Big Stone, SD, 2005
Mr. Jones performed a Best Available Control Technology (BACT) analysis for the preparation of a Prevention of Significant Deterioration (PSD) permit for the addition of a coal-fired boiler at Big Stone for Otter Tail in South Dakota. Mr. Jones also analyzed the additional cooling lake surface area required for the addition of a new 600 MW unit and for the supplementary surface area needed for the current unit at Big Stone. Mr. Jones utilized theoretical models of cooling lake performance to determine the lake surface area required as a function of the heat rejection to the lake and the required inlet temperature to the condenser.

Leland Olds Station Units 1 & 2, Basin Electric
Stanton, ND, 2004-2005
Mr. Jones prepared an evaluation of the Best Available Retrofit Technology (BART) evaluation for Leland Olds Station, Units 1 and 2. The purpose of the study was to perform a unit specific BART analyses at Leland Olds Station for compliance with the Regional Haze Rule.

Semi-Dry FGD Retrofit, Tractebel / Trigen
Syracuse, NY, 2004-2005
Mr. Jones was the Project Engineer for the addition of a semi-dry FGD system on an industrial cogeneration plant in Syracuse, New York consisting of five coal-fired boilers. The ductwork from all five boilers joined and was routed to a single absorber module. Mr. Jones' duties included writing specifications, bid evaluations, and managing the contract after award.

Mt. Storm Lake, Dominion Energy
Mt. Storm, WV, 2003-2004
Mr. Jones performed an analysis to determine the thermal response of Mt. Storm Lake utilizing various technologies in an effort to reduce the discharge temperature from Mt. Storm Lake into Stony River, which is a cooling reservoir for the 1590-MW coal fired Mt. Storm Power Station. Mr. Jones performed this study to aid Dominion Energy in the renewal of their discharge permit with the West Virginia Department of Environmental Quality.

Coal-Fired Power Plant Retrofit Project, Taiwan Power Co/E&C Energy
Hsinta Station Units 1 and 2, Taiwan, 2003
Mr. Jones was a Process Engineer for a coal-fired power plant retrofit at the Hsinta Station Units 1 and 2, both 500 MW units. The project consisted of FGD modifications, new SCR's, new air heaters, particulate control system modifications, new ID fans and ductwork modifications. Mr. Jones' work included performing as the Owner's Engineer in the design and specification of the FGD modifications.

Water Treatment Evaluation, MidAmerican Energy
Sioux City, IA, 2004
Mr. Jones performed studies for upgrades, improvements, or replacement of the existing demineralizer equipment at the Neal North and Neal South Generating Stations. Evaluation included various technologies included ion exchange and membrane based technologies. Life cycle cost estimates and drawings prepared with report summarizing findings of study.

Demineralizer Study, Northern Indiana Public Service Company
Chesterton, IN, 2003-2004

Mr. Jones performed a study to evaluate existing demineralizer system and propose new system or system upgrades at the Bailly Generating Station. Required new system to produce 260 gpm of demineralized water to support new selective catalytic reduction system and plume abatement controls. Water treatment equipment includes new micro-media filtration, two pass reverse osmosis, followed by off-site regenerated mixed bed vessels. Life cycle cost estimates prepared for replacement equipment or installation of new equipment technologies. Prepared report and drawings summarizing findings of study.

Multi-Pollutant Air Pollution Control Study, Roquette of America
Keokuk, IA, 2003-2004

Mr. Jones performed a study to install air pollution control equipment for Boilers 10 and 12 at this facility. The study involved selecting equipment and developing costs for the regulatory compliance equipment. The project lead into preparing design specifications to install two scrubbers and replace the existing baghouses for Boilers 10 and 12 at this facility.

Fire Protection Study, MidAmerican Energy
Sioux City, IA, 2003

Mr. Jones performed a study for separation of fire protection water from service water at the Neal North and Neal South Generating Stations. Changes to existing drawing identified. Hydraulic analysis for Neal South fire protection piping to determine source of water hammer. Prepared report and drawings summarizing findings of study.

Potable Water Study, MidAmerican Energy
Sioux City, IA, 2003

Mr. Jones performed a study for separation of existing potable water and service water systems. Study conducted for the Neal North Generating Station. Equipment replacement cost estimates prepared for several options. Prepared report and drawings summarizing findings of study.

Water Treatment Study, Ameren UE
St. Louis, MO, 2002-2003

Mr. Jones performed a study to review existing pretreatment and demineralizer facilities for three separate power plants – Meramec, Rush Island, and Sioux. Life cycle cost estimates prepared for replacement equipment or installation of new equipment technologies. Prepared report and drawings summarizing findings of study.

Marshall Station FGD Evaluation Study, Duke
Charlotte, NC, 2003

Mr. Jones performed a cost verification analysis of Duke Energy's Marshall Station Flue Gas Desulfurization EPC proposals. This project involved providing a +/-10% costs estimate for the proposed FGD retrofit project for Marshall Station's Unit 1-4. His duties included providing costs for the major FGD equipment along with estimating the cost for miscellaneous balance of plant items to provide a cost estimate sufficient to verify EPC prices received from qualified bidders.

Publications & Presentations

"Multi-Pollutant Control Project at Huntington Unit 2", published paper and presentation at the Power Plant Air Pollutant Control MEGA Symposium, August 2006.

"Huntington Unit 2 Multi-Pollutant Control Project", presented at the Electric Utility Environmental Conference (EUEC), January 2007.

"Multi-Pollutant Control Project at Cholla Unit 4", published paper and presentation at the Power Plant Air Pollutant Control MEGA Symposium, August 2008.

"Consent Decree Compiance at Cooper Station: Factors Affecting Air Pollution Control Technology Selection", published papar and presentation at the Power-Gen International Conference, December 2009.

"Cooper Unit 2 Multi-Pollutant Control Project", presented at the Association of Rural Electric Generating Cooperatives (AREGC) Coonference, June 2010.

"Recent Wet-Stack Conversions "Push the Envelope"", published paper at the Coal-Gen Conference, August 2010.

"Polishing Dry Scrubber Allows Reagent Optimization for CFB Boilers", published papar and presentation at the Power-Gen Asia Conference, September 2011.

"Comparision of Two Semi-Dry FGD Technologies: Spray Dryer Absorber (SDA) vs. Circulating Dry Scrubber (CDS)", published papar and presentation at the Power-Gen International Conference, December 2011.

"Innovations and Conversions of Electrostatic Precipitators to Fabric Filters", published papar at the Power-Gen International Conference, December 2011.

"Initial Start-Up and Commissioning of Circulating Dry Scrubber at Cooper Unit 2", published paper at the Power Plant Air Pollutant Control MEGA Symposium, August 2012.

Samuel E. Yoder

Engineering Manager / Process Engineer

Expertise
- Air Quality Control Systems

Education
- B.S. in Chemical Engineering, University of Missouri - Columbia, 2007
- B.S. in Mathematics, University of Missouri - Columbia, 2007

Registration
- Engineer in Training – Missouri

Total Years of Experience
5 years

Years With Burns & McDonnell
5 years

Start Date
June 2007

Mr. Yoder works on projects involving air pollution regulations and control technologies. His air quality experience includes projects that entail design, construction and start-up phases of major new and retrofit work at power plants. Mr. Yoder's work also includes development of cost estimates for air pollution control technologies for the control of SO_2, NO_X, particulate, sulfuric acid mist, and mercury emissions. Mr. Yoder is also involved in permitting projects for new coal-fired applications. Mr. Yoder supports the preparation of permit applications for new air pollution sources under state and federal New Source Review and PSD permit programs. Mr. Yoder has assisted on matters requiring regulatory analysis and interpretation. In this capacity, he is involved in preparation of Best Available Control Technology (BACT) and Maximum Achievable Control Technology (MACT) analyses.

CCR and NELG Compliance Review Study, Confidential Client
2013

Mr. Yoder served as a process engineer for a study with a confidential Client that reviewed the potential compliance options related to the upcoming coal combustion residuals (CCR) and the National Effluent Limitation Guidelines (NELG) for the Client's flagship plant. Mr. Yoder was responsible for taking physical measurements at the plant site and updating the water balance in support of reviewing the potential compliance options.

Mercury Control Technology Study, Confidential Client
2012-2013

Mr. Yoder was the process engineer responsible for a mercury control technologies study for a confidential Client. The study identified mercury control technologies that could be applied at several units within the Client's fleet to comply with the EPA's Mercury and Air Toxics Standards (MATS). The study included an assessment of each of the potential mercury control technologies and a review of the capital and O&M costs for implementing each technology.

Cooper Station Unit 2, East Kentucky Power Cooperative
Burnside, KY, 2009-2013

Mr. Yoder was the process engineer for the Cooper Unit 2 environmental project. The project involves the addition of a dry flue gas desulfurization (FGD), baghouse, and selective catalytic reduction (SCR) systems to Cooper Station Unit 2, which is 225 MW.

Mr. Yoder was the field mechanical engineer for the Cooper Unit 2 environmental project. In this role, Mr. Yoder answered both technical and contractual questions from the installing contractors, assisted in coordinating the onsite work activities between multiple installation contractors, and coordinated and managed the equipment manufacturer's field representative services.

Mr. Yoder was the process commissioning engineer for the Cooper Unit 2 environmental project. In this role, Mr. Yoder assisted in commissioning the SCR, the circulating dry scrubbing FGD, primary air fan, forced draft fan, induced draft fan, and air heater. In addition, Mr. Yoder assisted in commissioning the balance of plant equipment for the Cooper Unit 2 environmental project.

Hugo Station Unit 1, Western Farmers Electric Cooperative
Hugo, OK, 2008-2008

Mr. Yoder was the process engineer for the Hugo Unit 1 mercury control project. The project entailed performing a technology assessment.

BACT Analysis, Old Dominion Electric Cooperative
Glen Allen, VA, 2008-2009
Performing BACT and MACT analysis for the preparation of PSD permit application and state permit applications for two 750-MW coal fired units. The analyses included determining BACT and MACT emission rates for a PC boiler firing bituminous coal and blending renewable resource fuels.

Cholla Power Station Unit 3, Arizona Public Service
Joseph City, AZ, 2007-2009
Mr. Yoder was the process engineer for the Cholla Unit 3 scrubber and baghouse retrofit project for Arizona Public Service. The project involved the addition of a wet FGD system and the replacement of the existing hot side electrostatic precipitators (ESP) with a baghouse. The Unit 4 ESP, which was abandoned on a previous project, is being converted into the Unit 3 baghouse. This project was performed on an Engineering, Procurement and Construction (EPC) contract basis.

BACT Analysis, NextGen Project, Basin Electric Power Cooperative
Bismarck, ND 2007-2008
Performed BACT analysis for the preparation of PSD permit application and state permit applications for one 700-MW coal fired unit. The BACT analysis included determining BACT emission rates for a PC boiler firing PRB coal.

Seminole Generating Stations Units 1 & 2, Seminole Electric
Palatka, FL, 2007-2008
Detailed engineering and design for modifications existing air pollution control equipment and installation of new air pollution control equipment for the existing Units 1 and 2. Work includes new SCRs, urea injection, sorbent injection testing, sorbent injection equipment for SO_3 control, and FGD modifications including new mist eliminator wash, installation of perforated trays, and new gypsum dewatering equipment.

Merom Station, Hoosier Energy Rural Electric Cooperative, Inc.
Sullivan, IN, 2007
Development of specifications and drawings for procurement of sulfuric acid mist (SAM) control system. System was designed for reagent injection upstream of the existing particulate collection device. Assisted with issuing specifications for bid and responding to bidder questions.

Carl V. Weilert, P.E.

Principal Air Pollution Control Process Consultant

Expertise
- Air Quality Control Systems

Education
- B.S. in Engineering Science, Rockhurst University, 1974

Registration
- Professional Engineer – Missouri

Years Experience
37

Years With Burns & McDonnell
37

Start Date
1974

Mr. Weilert currently serves as Principal Air Pollution Control Process Consultant in Burns & McDonnell's Energy Division. Mr. Weilert is a nationally renowned authority in the field of air pollution control, including flue gas desulfurization (FGD) systems, multi-pollutant legislation and regulations, and mercury control technologies. He has over 30 years' experience in the field of air pollution control for coal-fired power plants, and has authored more than 40 articles and papers on various aspects of this topic.

Mr. Weilert has been involved in evaluation, design, upgrade, and optimization of FGD systems for more than 30 years. During this time he has gained first-hand knowledge of the commonly used FGD processes including those for wet scrubbing and for dry FGD. His project experience includes work with conventional lime and limestone systems, dual alkali systems, amine scrubbing, ammonia scrubbing, lime spray drying and fluidized bed dry scrubbing. He has also reviewed designs of systems for CO_2 capture.

Mr. Weilert also serves as project manager on individual air pollution control projects. He leads project teams in efforts that range from evaluation studies to detailed designs. Recently, he has managed several studies related to evaluation of alternatives for air pollution control at existing utility boilers as a result of the best available retrofit technology (BART) requirements of the regional haze rule, the maximum achievable control technology (MACT) rule, and the Cross State Air Pollution Rule (CSAPR).

Mr. Weilert's recent project experience includes studies, conceptual design development and equipment specifications related to air pollution control equipment retrofits at large coal-fired utility power stations. For recent projects involving development of new coal-fired power stations, he has performed consultation and review during the development of the best available control technology (BACT) and MACT analyses.

PROJECT EXPERIENCE:

Boswell Energy Center, Minnesota Power
Cohasset, MN, 2011 - present
Process consultant for retrofit of circulating dry scrubber (CDS) and pulse-jet fabric filter (PJFF) to 525 MW unit firing PRB coal.

Longview Power Plant, GenPower
Maidsville, WV, 2011 - present
Process troubleshooting for wet limestone FGD system at new 695 MW supercritical coal-fired unit firing bituminous coal.

Expert Testimony, Minnkota Power
Bismarck, ND, 2011
Preparation and presentation of expert testimony at public hearing on the U.S. EPA's proposed imposition of a Federal Implementation Plan (FIP) for regional haze related to NO_x control requirements for Units 1 and 2 at the Milton R. Young Station.

Lansing Unit 4, Alliant Energy
Lansing, IA, 2011- present
Project air pollution control consultant for retrofit of circulating dry scrubber (CDS) for PRB coal-fired 256 MW Unit.

Harrington and Tolk Stations, Xcel Energy
Amarillo, TX, 2011
Project air pollution control consultant for study of emissions control retrofits required

for five PRB coal-fired units at two plants for compliance with MACT, BART and CSAPR regulations.

CO_2 Capture Process Review, Peabody Energy
St. Louis, MO, 2011
Lead air pollution control consultant for review of emissions control process based on enzyme-catalyzed absorption of CO_2 from power plant flue gas.

Ottumwa Unit 1, Alliant Energy
Ottumwa, IA, 2011- present
Project air pollution control consultant for retrofit of spray dryer absorber (SDA), pulse jet fabric filter (PJFF) and activated carbon injection (ACI) for SO_2 and mercury control for 715 MW PRB coal-fired unit.

Fleetwide Emission Control Evaluation, Confidential Client
Texas, 2010 - 2011
Lead air pollution control consultant for review of emissions control retrofits and upgrades required for nine coal-fired units at four plants for compliance with current and future environmental regulations.

Tenaska Trailblazer Energy Center, Tenaska, Inc.
Sweetwater, TX, 2010 - 2011
Project air pollution control consultant for owner's engineer review of design documentation for CO_2 capture system on 765 MW coal-fired unit.

EGU MACT Evaluation, Cleco Corporation
Pineville, LA, 2010
Assessment of the effects of the upcoming coal-fired Electric Generating Unit MACT rule on Cleco's three coal-fired EGUs.

Edgewater Unit 4, Alliant Energy
Sheboygan, WI, 2010
Feasibility assessment of SO_2 control using dry sorbent injection (DSI) on this 321 MW unit firing PRB coal.

BACT Study for Coal-Fired Plants, Taft Stettinius & Hollister LLP
Wisconsin, 2010
Lead air pollution control consultant for review of feasibility and cost of BACT-compliant emissions control retrofits to three coal-fired units at two plants.

Antelope Valley Station Unit 1, Basin Electric Power Cooperative
Beulah, ND, 2010
Project air pollution control consultant for owner's engineer review of FEED study documentation for CO_2 capture system on 120 MW slipstream from lignite-fired unit.

Blast Furnace Gas Cogeneration Project, Air Products & Chemicals, Inc.
Middletown, OH, 2010
Project air pollution control process consultant for specification and procurement of wet ESP for cleanup of blast furnace gas in preparation for firing in a combustion turbine.

2000 MW Supercritical CFB Coal Fired Power Plant, KOSPO/KOPEC
Korea, 2010 – Present
Project air pollution control process consultant for two 1000 MW supercritical units each consisting of two (2) CFB boilers feeding to one (1) turbine located in Kwangwon-Do, Korea. The project consists of technical advisory services for major design decisions and review of technical design reports.

Big Stone 1, Otter Tail Power
Big Stone, SD, 2009
Process consultant for preparation of best available retrofit technology (BART) evaluation for 475 MW coal-fired unit.

Mercury Emission Control Alternatives Study, E•ON US
Louisville, KY, 2009
Process consultant for evaluation of mercury emission control technologies for 18 coal-fired units at six plants in Kentucky.

Cooper Unit 2, East Kentucky Power Cooperative
Burnside, KY, 2008 - present
Lead process consultant for circulating dry scrubber (CDS) and selective catalytic reduction (SCR) retrofit to 225 MW coal-fired unit for compliance with Consent Decree.

Emission Evaluation, Electric Power Research Institute
Palo Alto, CA, 2008-2009
Project manager for investigation and report on "Assessment of SO_2 Emissions Control Achieved in Practice During Startup and Shutdown" [EPRI 1015764]

Walter Scott, Jr. Energy Center, MidAmerican Energy
Council Bluffs, IA, 2008
Lead investigator for optimization studies for control of SO_2, NO_x and mercury emissions from 790 MW Unit 4 in compliance with permit requirements.

R. M. Schahfer Generating Station, Northern Indiana Public Service Co.
Wheatfield, IN, 2007-2008
Project manager for investigation of causes for and evaluation of solutions to excessive solids discharge from FGD systems to waste disposal pond.

Development of Coal-Fired Plant, Old Dominion Electric Cooperative
Glen Allen, VA, 2007- 2010
Process consultant for development of new 2 x 750 MW coal-fired steam electric station, including consultation for and review of the BACT and MACT analyses.

NextGen Project, Basin Electric Power Cooperative
Bismarck, ND 2007- 2009
Process consultant for development of new 700 MW coal-fired steam electric generating station, including review of air pollution control technologies and consultation during development of BACT and MACT analyses.

Milton R. Young Station, Minnkota Power
Center, ND, 2006-2011
Lead process consultant for FGD retrofit and FGD modifications for SO_2 emission

control and project manager for preparation of BACT analyses for NOx emission reductions for compliance with Consent Decree at Milton R. Young Station.

BACT Compilation and Analysis, Electric Power Research Institute
Palo Alto, CA, 2006
Project manager for investigation and report on "Status and Performance of Recently Permitted BACT/LAER Plants" [EPRI 1013346]

Big Stone II, Otter Tail Power
Big Stone, SD, 2006
Lead process consultant for evaluation of FGD system bid proposals for Big Stone II power plant project.

Milton R. Young Station, Minnkota Power
Center, ND, 2005-2007
Project manager for preparation of best available retrofit technology (BART) evaluation for two lignite-fired units at Milton R. Young Station.

Fayette Power Project, Lower Colorado River Authority
La Grange, TX, 2005-2007
Lead process consultant for conceptual design and specification of FGD retrofit to two 600 MW units at Fayette Power Project.

Multi-Pollutant Control Technology Evaluation, Electric Power Research Institute
Palo Alto, CA, 2004-2005
Process consultant for evaluation of reliability of Powerspan Electro-Catalytic Oxidation (ECO) multi-pollutant control technology.

Leland Olds Station Units 1 & 2, Basin Electric
Stanton, ND, 2004-2005
Project manager for preparation of Best Available Retrofit Technology (BART) evaluation for Leland Olds Station, Units 1 and 2.

BACT Evaluation, Electric Power Research Institute
Palo Alto, CA, 2004-2005
Project manager for investigation and report on "Status and Performance of Best Available Control Technologies" [EPRI 1008114]

Air Pollution Regulations Study, Oklahoma Gas & Electric
Oklahoma City, OK, 2004
Project manager for study of the effect of future air pollution control regulations for NO_x, SO_2 and mercury on the coal-fired boilers in the OG&E system.

Craig Station, Tri-State Generation & Transmission Association
Craig, CO, 2000-2004
Lead process consultant for air pollution control system retrofits to two 450MW coal-fired boilers in Craig, Colorado, including feasibility studies, procurement specifications, and bid evaluation.

Air Pollution Regulations Study, Vectren Corporation
Evansville, IN, 2004
Project manager for study of the effect of future air pollution control regulations for NO_x, SO_2 and mercury on the coal-fired boilers at three generating stations in the Vectren system.

MACT Assessment, Tractebel / Trigen
Syracuse, NY, 2004
Project manager for assessment of the effect of the Industrial Boiler MACT and other regulations on an industrial cogeneration plant in Syracuse, New York consisting of five coal-fired boilers.

Mercury Evaluation, Peabody Energy
St. Louis, MO, 2004
Evaluation of the effect of the EPA's proposed mercury rule on two proposed coal-fired electric generating plants.

Merrimack Units 1 & 2, Public Service New Hampshire
Concord, NH, 2004
Evaluation of the feasibility and cost of mercury control alternatives for Merrimack Units 1 and 2.

Technical Feasibility Analysis, Confidential Client
2003-2004
Preparation of technical feasibility analysis of FGD retrofits to seven coal-fired units in response to EPA NSR enforcement action.

Air Pollution Regulations Study, Constellation Energy
Baltimore, MD, 2003
High-level evaluation of requirements for compliance with current and future air pollution control regulations for SO_2, NO_x and mercury emissions from all coal- and oil-fired boilers in the Constellation Energy system.

Air Pollution Regulations Study, CLECO
Pineville, LA, 2002-2003
Project manager for study of the effect of future air pollution control regulations for NO_x, SO_2 and mercury on the coal-fired boilers in the CLECO system.

Leland Olds Station, Basin Electric
Stanton, ND, 2002
Project manager for evaluation of costs and BOP impacts for air pollution control equipment retrofit options for compliance with future regulatory requirements for reduction in emissions of SO_2 and mercury at Leland Olds Station.

Air Pollution Regulations Study, Associated Electric Cooperative, Inc.
Springfield, MO, 2002
Process engineer for study of the effect of future air pollution control regulations for NO_x, SO_2 and mercury on six coal-fired boilers.

Additional experience available upon request.

Michael J. McMahon, P.E.

Senior Associate Structural Engineer

Expertise

- Structural Design of Industrial Facilities
- Construction Contract Management

Education

- B.S. in Civil Engineering, University of Kansas, 1980.
- M.S. in Civil Engineering, University of Kansas, 1989.

Organizations

- American Society of Civil Engineers

Registration

- Professional Engineer – Arizona, Georgia, Iowa, Kansas, Missouri, Nebraska, Oklahoma, Virginia

Total Years of Experience

32

Mr. McMahon has 30 years experience in the construction and design field. In addition to his design experience he has considerable experience in the areas of cost estimates, project definition, permitting, field inspection, testing, and quality control.

As lead Civil Structural (C/S) Engineer, he is responsible for all civil and structural work which includes development of design criteria, project definition reports, estimates, technical specifications, design, detailing, and development of required construction packages.
Representative projects include the following:

Combined Cycle Project Definition Reports, Confidential Clients

Lead Structural Engineer for combined cycle project definition reports at multiple sites in the United States. Mr. McMahon was responsible for development of structural design criteria and cost estimate quantities for foundations, buildings, structural steel, cranes, and elevators. He developed bid specifications and obtained budgetary quotes for materials for large procurement packages.

Indian River, NRG Energy

Dagsboro, DE

Lead Foundations Engineer for air quality upgrade project on Units 3 and 4 of the Indian River Generation Facility. The project included new ID fans, two SCRs, service transformers, ductwork, and new fabric filter modules. Foundations utilized micro-piles, displacement piles, and low overhead grouted piles. Mr. McMahon was responsible for procurement packages and structural design of all piling, foundations, pipe racks, and temporary structures.

Cholla 3 & 4, Arizona Public Service

Joseph City, AZ

As lead structural engineer for air quality upgrade projects on Units 3 and 4 of the APS Cholla Generation Facility. Both projects included new ID fans, ductwork, flue gas desulfurization equipment, and new fabric filter modules. Mr. McMahon was responsible for procurement packages and structural design of all ductwork, duct supports, pipe racks, pre-engineered buildings, and foundations.

Cambridge Energy Center, Great River Energy

Cambridge, MN

Lead Structural Engineer for the new generation facility consisting of a single Siemens Westinghouse V84.3A gas turbine. Mr. McMahon was responsible for design of all foundations and procurement specifications for buildings on the project.

Roquette America

Keokuk, IA

Lead Structural Engineer for combined cycle cogeneration project. Mr. McMahon was responsible for design of foundations for the gas turbine, steam turbine, HRSG, pipe racks, and buildings. He designed the steel pipe rack from the steam turbine building to the tie-in at the existing plant.

Zeeland, Southern Company

Zeeland, MI

Lead Structural Engineer for the new generation facility consisting of two GE 7FA simple cycle units and a two on one GE 7FA with GE D11 Steam Turbine combined cycle plant. Mr. McMahon was responsible for design of all foundations, pipe racks and buildings on the project, in addition to design and procurement of steam piping supports. Major foundations required for the project included a steam turbine generator

and four gas turbine generators. The project included a pipe rack consisting of over 200 tons of structural steel, equipment access platforms, and a steam turbine building with a bridge crane.

Ardmore Refinery, Valero
Ardmore, OK
Lead Structural Engineer for the Steam Generating Project at the Ardmore Refinery. The design work include foundations for the steam turbine, steam piping supports, structural steel equipment platforms and removable canopy, pipe racks, and a cooling tower basin. Mr. McMahon was responsible for procurement packages and structural design of all drilled shafts, foundations, pipe racks, and steel access structures.

Sheboygan Energy Center, Alliant Energy
Sheboygan, WI
Lead Structural Engineer for economizer modification project which included economizer hoppers, air heater inlet duct, and fly ash conveying. Mr. McMahon designed structural modifications to the economizer section of the coal fired forced draft cyclone boiler. New ash hoppers were added with associated ash conveyance piping and equipment. Mr. McMahon coordinated air flow model testing and turning vane addition to the air heater inlet ductwork to improve ash collection and relieve air heater blockage.

R.M. Schahfer, Northern Indiana Public Service Company
Wheatfield, IN
Project Manager for coal chute upgrade projects. Mr. McMahon was responsible for construction packages to upgrade head chutes, diverter gates, and loading tables on existing coal conveyor systems.

Michigan City, Northern Indiana Public Service Company
Michigan City, IN
Lead Structural Engineer for auxiliary boiler installation project. Mr. McMahon was responsible for boiler building steel and foundation design and equipment foundations.

Pinckneyville, Ameren
Pinckneyville, IL
Mr. McMahon was the lead civil engineer for Phase 1 of the new generation facility consisting of four GE LM6000 simple cycle units. Mr. McMahon was responsible for the design of site grading, storm sewers, and a two-mile water supply line.

Dayton Power and Light Company
Miamisburg, OH
As lead structural engineer for a new cooling tower installation on the plant discharge system, Mr. McMahon was responsible for design of sheet piling, the cooling tower foundation, and pipe supports.

NutraSweet Kelco Company
San Diego, CA
Lead C/S engineer for the plant upgrade project. Mr. McMahon was responsible for structural design of pipe supports, equipment platforms, cooling tower foundations, and fire safety upgrades of structures. Major structures included a five-story platform designed to meet seismic zone 4 requirements.

PQ Corporation
Kansas City, KS

Mr. McMahon was the lead C/S engineer, for the Molecular Sieve project and construction permit coordinator for the PP4 and Molecular Sieve projects. He was in charge of site work design, including the storm-water management. His structural design responsibilities included pre-engineered building specifications, modifications of existing structures, equipment supports, guyed stack design, access platforms, lateral load analysis, and a vibration study. Mr. McMahon coordinated all building finish bid documents including painting, locker rooms, control rooms, and offices. All design was accomplished under a fast-track schedule.

Danisco Ingredients
St. Joseph, MO

Mr. McMahon was the Project Engineer and lead C/S Engineer for the design/build new plant construction and equipment relocation. His responsibilities included coordination of the multi-discipline design effort, construction permits, and C/S design. The project consisted of site development, relocation of process equipment to a new concrete frame process tower, and new precast concrete office and warehouse.

Ralston Purina
Atlanta, GA and Davenport, FL

Served as lead C/S Engineer for plant upgrades. Work included structural steel, masonry, foundations, and analysis of existing concrete frame structures. The retrofit projects included new process structures, a frozen ingredients warehouse, electrical utility rooms, conveyor supports, and roof modifications.

St Paul Park Refinery, Northern Tier Energy
St Paul, MN

Lead Foundations Engineer for Wastewater Cooler and FCC Heater Replacement Projects. The project included site grading and roadway improvements, a cooling tower, a new FCC Heater, an independent support structure for a new stack addition on an existing heater, and pipe rack structures. Foundations utilized hydro excavation for piers, footings, and mat foundations. Mr. McMahon was responsible for site work and structural design of all foundations and miscellaneous pipe racks.

Allco Chemical Corporation
Galena, KS

Served as lead C/S Engineer on the new production line addition. Scope included basic design, cost estimate, and detailed design. The plant expansion consisted of a new process tower within an existing structure, pipe racks, and foundations for process vessels.

Crosfield Catalysts
Chicago, IL

Mr. McMahon served as lead C/S Engineer from basic design through construction. The design included access platforms, pipe racks, and process towers constructed within an existing facility. In addition, Mr. McMahon coordinated construction permit activities.

Aqualon
Hopewell, VA

Mike was the lead Civil/Structural Engineer for Aqualon Company's new CMC dry product handling building in Hopewell, Virginia. The new, 7-story steel frame structure was designed with Good Manufacturing Practices (GMP) as an important criterion. Mr.

McMahon was responsible for the building features as well as the foundations, utilities, structural frame, and explosion venting.

Previous Experience:

Prior to joining Burns & McDonnell, he was a Project Engineer with Raytheon Service Company. He designed fire safety improvements for the various air traffic control towers. He was the Project Engineer for 28 underground storage tank removal and site assessment projects at remote facilities operated by the Federal Aviation Administration. During his two years with Raytheon Service Co., Mr. McMahon was responsible for cost estimates and budget control during the design and construction phases.

At Kansas City Testing Laboratory, he was Project Manager for the new General Motors plant in Kansas City, KS. During his seven years at KCTL, Mr. McMahon was responsible for construction quality control on a wide range of projects and developed construction quality control programs.

William E. Goh, P.E.

Associate Civil Engineer

Expertise

- Hydrology / Hydraulics
- General Civil Engineering Design, Procurement, and Construction
- Project and Contract Management

Education

- Bachelor of Science in Civil Engineering, Kansas State University, 1987, Honors; Cum Laude

Registration

- Professional Engineer – Kansas
- Professional Engineer – Commonwealth of Virginia
- Professional Engineer – Florida

Total Years of Experience

24

Years With Burns & McDonnell

14

Start Date

1998

Mr. Goh is a civil engineer with a strong emphasis in hydrology and hydraulics. He started his engineering career in the power industry. He has been responsible to design and support most of the civil related power plant projects. Other responsibilities included site development, plant site arrangement, site grading and drainage plans, site underground utilities/yard piping, material handling, runoff and settling ponds, road paving, railroads, preparing contract specifications, establish the scope of work, cost estimating, construction related issues, project management, preparing bid proposals, and marketing for new project or expanded scope. He has also been involved with work related to air quality control system for coal fired power plants and the new EPA 316(b) cooling water intake impingement and entrainment feasibility studies. He is also experienced in conducting the warm water discharge issues pertaining to the EPA 316(a) regulation for power plants. Some of his other work included studies to segregate process effluent from stormwater system, and develop the civil work specifications for the new flue gas desulphurization area and baghouse.

Mr. Goh is also a lead hydraulic engineer who has worked on major projects for utility companies' worldwide. His expertise is in solving challenging hydraulic issues related to power plant circulation cooling water systems. His technical expertise enables him to resolve issues such as hydraulic calculations for pipes, intake screens, pipe fitting, pumphouse and discharge structures. He has designed sealwells for coal plants, and pipes to handle flows over 2000 cubic feet per second capacity for seawater once through cooling system. He has also been involved with the construction of the offshore intake structures and large diameter circulating water-piping systems.

Mr. Goh is also experienced with hydroelectric generation plants. He conducted energy estimates for feasibility studies taking into account the river's flow duration data from USGS. Other hydraulic structures Mr. Goh designed include penstock sizing, spillway design, intake screen sizing, intake pump structures, discharge canal, and outlets. He has also managed six Francis type hydroelectric turbine rehabilitation work in Oklahoma totaling 129MW capacity.

Mr. Goh has performed numerous hydrologic studies involving the use of computer modeling to simulate rainfall hydrographs for a given event, and DAMBRK model for FERC relicensing application. He is also responsible to provide alternatives and conclusions to the hydraulic model.

Crystal River Air Quality Control, Progress Energy

Florida, 2012-Present

Project manager and lead civil engineer for the FGD Reclaimed Water project at the Crystal River Units 4 & 5 coal plant. The scope included underground piping, fiber optic cabling, control valves, and retro fitting new piping to existing service water and filtrate tanks. Prepare project schedule, construction cost estimating, progress report and managing resources to support the project.

Warren County Combined Cycle, Dominion Virginia Power

Virginia, 2011-2012

EPC scope for a combined cycle 3x1 power plant with air cooled condenser. Involved with the Bid Proposal development and cost estimates and project scheduling. Preparing the overall site arrangement for the basis of the proposal. Developed the underground utilities, excavation plan, civil drawings and specifications for the bid to estimate construction cost. Provide technical support to the project team to coordinate the site work, Owner interface, and underground utilities.

Bowersock Hydroelectric
Kansas, 2010
Owner's engineer responsible for reviewing the proposed conceptual design for installation of a new hydroelectric plant on an existing dam. The scope included review of the cost estimate and drawings.

Cleco – Lock & Dam Mississippi River
Mississippi, 2010
Owner's engineer responsible for reviewing and independent check of the proposed conceptual design for the existing lock and dams. The scope also included energy yield estimates based on the flow duration and proposed equipment.

Moselle Repowering, SMEPA
Mississippi, 2010
Lead civil engineer responsible for the site preparation contract. Responsible for issuing the drawings and specifications for site development work for installing two combustion turbines and HRSGs. Work included site grading, construction laydown and site finishing work. Relocation and demolition of existing underground utilities were included.

Crystal River Air Quality Control, Progress Energy
Florida, 2007-2010
Lead civil engineer for the air quality and coal yard upgrade work at Crystal River Units 4 & 5 coal plant. Also involved with the Bid Proposal development and cost estimates. The civil scope for the FGD upgrade included design for new lined coal pile runoff ponds, FGD blowdown settling ponds, coal yard lining, railroad for urea unloading facility, and a 5 mile long well potable water supply pipeline. Additional responsibilities included construction and design coordination, and permitting support effort. The ponds were designed with Geosynthetic Clay Liner system with discharge pump structures.

316(b) Studies, MidAmerican Energy
Iowa, 2010
Project manager responsible for the EPA Section 316(b) feasibility studies at the Neal South Energy Center. The study includes modifications to the existing intake structure traveling screens to reduce impingement mortality. The evaluation also included modification to the existing fish return trough and adding new fish baskets.

Merom Generating Station, Hoosier Energy
Indiana, 2009
Project manager and lead engineer for performing alternatives to resolve cooling lake high temperatures with regards to environmental issues and plant performance. Options included replacement cooling towers and supplemental helper cooling towers. Other alternatives being evaluated were lake channelization, aeration, and lake spray coolers. Cost estimates and performance benefits were also evaluated and incorporated into the life cycle analysis of the investment.

Lowman Generating Station, Alabama Electric Cooperative, Inc.
Alabama, 2006
Project manager responsible for developing the cooling water pipe modification contract. The work award was a result of a study previously performed in 2003. The contract was based on RUS terms and conditions. Scope of work include over 1000 feet

of 84-inch diameter steel pipe, piling, foundation, large butterfly valves, existing pipe tie-in modifications, coating, and cathodic protection.

Alaoji, NEPA, Nigeria
Aba, Nigeria, 2005-2006
Lead civil engineer responsible for developing the contracts for site survey, grading, detention pond, and infrastructure layout for the new two blocks of 2x1 combined cycle plant at the Alaoji site in Aba, Nigeria.

Huntington Unit 2, PacifiCorp
Huntington, UT, 2005
Lead civil engineer responsible for coordinating the site survey, grading, and infrastructure layout for the new FGD and bag house upgrade project at the existing Huntington Station Unit 2 in Utah.

316(b) Studies, Alliant Energy
Wisconsin, 2005
Project manager responsible for the EPA Section 316(b) feasibility and Proposal for Information Collection studies at the following power plants; Fox Lake, Edgewater, Lansing, Nelson Dewey, Prairie Creek, Sixth Street, Rock River, Black Hawk, Dubuque, ML Kapp, and Burlington. The study includes review of the existing plant intake hydraulics to determine the available options. The study also includes estimated cost for the options presented along with the pros and cons, schedule for implementation, and recommendations.

316(b) Studies, Wisconsin Power and Light
Wisconsin, 2005
Project manager responsible for the EPA Section 316(b) feasibility and Proposal for Information Collection studies at the following power plants; Weston, Pulliam, Beaver Falls, Stoneman, and Kewaunee. The study includes review of the existing plant intake hydraulics to determine the available options. The study also includes estimated cost for the options presented along with the pros and cons, schedule for implementation, and recommendations.

316(b) Studies, Garland Power and Light
Garland, Texas, 2005
Project manager responsible for the EPA Section 316(b) feasibility and Proposal for Information Collection study at the Ray Olinger Power Plant. The study includes review of the existing plant intake hydraulics to determine the available options. Review the historical lake elevation data for engineering options. The study also includes estimated cost for the options presented along with the pros and cons, schedule for implementation, and recommendations.

316(b) Studies, CWLP
Springfield, Illinois, 2005
Responsible for the EPA Section 316(b) feasibility and Proposal for Information Collection study on the Dallman and Lakeside Power Stations. The study includes review of the existing plant intake hydraulics to determine the available options. The study also includes estimated cost for the options presented along with the pros and cons, schedule for implementation, and recommendations.

Oklahoma City Tank Farm, ConocoPhilips
Oklahoma City, OK, 2005
Project manager and lead engineer responsible for the complete SPCC FEL-3 secondary containment upgrade study with cost estimates, sketches with plan and section, and recommendations to modify the existing oil tank containment. The study included evaluation of the least cost alternative and implementation schedule. Fuel oil unloading area is also included in the scope.

Deely Station, City Public Service
San Antonio, TX, 2004
Lead civil engineer for the development of the civil construction specifications for an EPC contract to modify and add bag houses for the existing two units for CPS. Coordination with other disciplines for equipment interface issues.

Cushing Tank Farm, ConocoPhilips
Cushing, Oklahoma, 2004
Lead engineer responsible for the complete SPCC FEL-3 secondary containment upgrade study with cost estimates, sketches with plan and section, and recommendations to modify the existing oil tank containment. The study included evaluation of the least cost alternative and implementation schedule.

Ponca City Tank Farm, ConocoPhilips
Ponca City, Oklahoma, 2004
Lead engineer responsible for the complete SPCC FEL-3 secondary containment upgrade study with cost estimates, sketches with plan and section, and recommendations to modify the existing oil tank containment. The study included evaluation of the least cost alternative and implementation schedule.

Coal-Fired Study, Alabama Electric Cooperative
Alabama, 2003
Project manager responsible for a complete study with cost estimates, and recommendation to modify the existing cooling water pipes. The existing circulating water pipes each share a common cold and warm water pipe to the cooling towers. The purpose is to develop methods to isolate the pipes into independent systems and minimize plant outage time.

Simple Cycle Cogeneration Plant, Roquette America, Inc.
Iowa, 2003
Lead civil engineer for the development of the project site. Responsible for the site civil construction specifications and drawings. Coordination with other disciplines for equipment interface issues.

Bonne Carre Power Plant, Sempra
Baton Rouge, Louisiana, 2002
Lead civil engineer for developing the conceptual layout of the project site. Responsible for review of the EPC design documents.

Mesquite Power Plant, Sempra
Phoenix, Arizona, 2002
Lead civil engineer for evaporation pond design and Owner's engineer. Responsible for reviewing the EPC design documents and the design of two 60 acres zero discharge evaporation ponds for the plant. The ponds were designed with composite HDPE liner

system with leak detection and pumpback sump. The effort also included coordination with the Arizona permitting agencies for the ponds.

Aries II Power Plant, Aquila
Cass, Missouri, 2002
Lead civil engineer for project site development for three Siemens-Westinghouse 501D5A. Task included site development and design for asphalt concrete road paving, site drainage, permitting support, erosion control, and constructability.

Combustion Turbine Plants, SMEPA
Mississippi, 2001
Owners' engineer and lead civil engineer responsible for the site preparation contract. Responsible for issuing the EPC specifications for site development work for installing a total of eight GE combustion turbines at two sites. Work included site grading and road paving for construction access.

D.B. Wilson Station, Western Kentucky Electric
Island, Kentucky, 2001
Project manager and lead engineer responsible for a complete study and recommendation to modify the existing plant drainage to prevent plant process waters from entering the storm water runoff system. The D.B. Wilson Station KPDES permit requires that the storm water run-off system and the plant sumps and drains systems be segregated. However, on occasion the plant scrubber drains and effluent from sumps have overflowed into the stormwater system. Result from the study was later implemented by WKE.

Clarksdale Combustion Turbine Plant, Clarksdale Public Utilities
Clarksdale, Mississippi, 2001
Lead civil engineer responsible for site development for four GE 7EA units. Task included site development for drainage, permitting support, erosion control, and constructibility.

Columbia Combustion Turbine Plant, Ameren
Columbia, Missouri, 2000
Lead civil engineer responsible for site development for four GE 6B combustion turbine units. Task included site development and design for bituminous seal road paving, site drainage, permitting support, erosion control, and constructibility with easement for future CT addition.

Harris Power Plant, ANP
Texas, 2000
Responsible for the conceptual implementation, and final design of a 5 mile raw water supply line to the on-site water treatment plant, and cooling towers. The initial study evaluated 2 water supply options and pipe route to the plant based on reliability, construction cost, and construction schedule. Work include design of an intake pumphouse, pipe alignment, storage pond, diversion weir, and pipe bridges.

Additional experience available upon request.

Ryan D. Baumgardner

I&C Engineer

Expertise

- Field Instrumentation
- Distributed Control Systems
- Communication Link Programming and Commissioning
- Power Plant Logic generation and implementation
- Startup and Commissioning
- I&C Equipment and Field Installation Contract Administration and Construction oversight

Education

- B.S in Electrical Engineering, University of Missouri, 2007

Total Years of Experience

5

Years With Burns & McDonnell

5

Start Date

2007

Mr. Baumgardner is currently assigned to the Electrical and Controls Department in the Energy Division as an Instrumentation & Controls (I&C) Engineer. He is responsible for Distributed Control System (DCS) design including procurement specifications, database management, analog and digital control logics, graphics development and communication link configuration. He has worked on an SNCR water treatment addition, cogeneration upgrade project, coal plant DCS upgrade study, new Lignite coal mine addition, and coal plant AQCS additions.

Crystal River Units 4 & 5 FGD/SCR Project, Progress Energy Florida

Crystal River, Florida, 2007-2011

Mr. Baumgardner worked as the I&C design engineer on the Crystal River, Units 4 & 5 FGD/SCR project for Progress Energy Florida, Inc. He was responsible for design and commissioning of control instrumentation with Foundation Fieldbus and DeviceNet communication. In addition, he also designed, programmed, and commissioned serial communication links between the DCS, electrical equipment, and PLCs. Mr. Baumgardner acted as the sole responsible engineer for programming and commissioning of the DCS logic, graphics, and database for a new FGD soft water system. In addition to the soft water system, he redesigned the FGD blowdown system and pump flush sequences. This included programming logics and graphics, commissioning, and starting up all systems involved. For the duration of the project, he managed the I/O database and pressure gauge contract.

Chevron McKittrick Cogeneration Upgrade Project

McKittrick, California, 2010-2011

Mr. Baumgardner was responsible for creating control wiring diagrams, cable schedules, and field device location plans for the Electrical Construction package.

Milton R. Young Common SNCR Project, Minnkota Power Cooperative

Center, North Dakota, 2011

Mr. Baumgardner worked as the sole I&C engineer on the addition of the SNCR Water Treatment equipment for the Milton R. Young SNCR Project. He was responsible for partitioning I/O, designing the DCS cabinet layout, and managing the I/O database. In addition, Mr. Baumgardner designed the project graphics and logics. During the DCS Factory Acceptance Test, Mr. Baumgardner managed and performed functional checkouts, and corrected logic and graphic discrepancies.

Warrick Control System Study, ALCOA Inc.

Newburgh, Indiana, 2011

Mr. Baumgardner designed a new PCS room layout drawing/plan and a control system architecture drawing for inclusion into a control system upgrade feasibility report.

Luminant Tatum Mine Relocation & Liberty Mine Construction Project

Tatum, Texas, 2011-Present

Mr. Baumgardner is the lead I&C engineer on the Luminant Tatum and Liberty mine project. Mr. Baumgardner wrote the I&C bid specifications for Luminant, which included control narratives, hardwired logics, a system architecture drawing, I/O & Instrument lists, and instrument installation details. In addition, he also designed the instrument location plans and network fiber wiring diagrams for both sites.

Neal 3 & 4 AQCS Addition Projects, MidAmerican Energy Company
Sergeant Bluff & Salix, Iowa, 2011-Present
Mr. Baumgardner is responsible for creating control wiring diagrams, cable schedules, and field device location plans for the Electrical Construction packages. In addition, Mr. Baumgardner reviewed vendor submittals and manages the Instrumentation contract.

Drew Hofrichter, P.E.

Mechanical Engineer

Expertise

- Contract Administration
- Mechanical Systems Design
- Air Quality Control Systems

Education

- B.S. in Mechanical Engineering, Kansas State University, 2007

Registration

- Professional Engineer – Kansas

Total Years of Experience

5

Years With Burns & McDonnell

5

Start Date

June 4, 2007

Mr. Hofrichter is a Staff Mechanical Engineer in Burns & McDonnell's Energy Division. His duties include the design of mechanical systems, development of equipment specifications, and preparation of construction contracts. His responsibilities also involve compliance submittal review and contract administration. Mr. Hofrichter has been involved in evaluation, design, and retrofit of air pollution control systems for coal-fired power plants.

Mr. Hofrichter's experience includes the following:

Neal Energy Center Units 3 and 4, MidAmerican Energy

Salix, IA, 2011 - Present

Mr. Hofrichter is involved as a mechanical engineer on the Neal Energy Center Units 3 and 4 scrubber and baghouse project in Salix, Iowa. The project consists of installing Spray Dryer-Absorbers (SDA), Fabric Filters, and balance of plant equipment for units 3 & 4. His responsibilities included well water and plant sump system design, as well as contract administration for ash handling, lime unloading, steel silos, horizontal pumps, submersible pumps, and below grade construction.

Confidential Site and Client

2010 - 2011

Mr. Hofrichter served as a mechanical engineer on a front-end engineering and design (FEED) study involving the addition of an air quality control system at an existing power plant. His responsibilities included a review of the existing site and facilities, layout of new equipment and piping, and development of equipment procurement and construction packages.

Crystal River Units 4 & 5, Progress Energy

Crystal River, Fl, 2007 - 2010

Mr. Hofrichter served as a mechanical engineer on the Crystal River Units 4 & 5 flue gas desulfurization (FGD) and selective catalytic reduction (SCR) Project in Crystal River, Florida. The project consists of installing an FGD system, SCR System, and all other associated equipment for units 4 & 5. Responsibilities included balance of plant system design, review of the existing site and facilities, layout of new equipment and piping, and development of equipment procurement and construction packages.

Mr. Hofrichter also served as a mechanical site engineer on the Crystal River project. His primary responsibility during his tenure on-site included providing mechanical construction field support.

David W. Bross

Staff Electrical Engineer

Expertise

- Development of technical specifications and deliverables for equipment procurement and electrical construction.

Education

- B.S. in Electrical Engineering, University of Missouri-Rolla, 2008

Organizations

- Institute of Electrical and Electronics Engineers (IEEE)

Total Years of Experience

4

Years With Burns & McDonnell

4

Start Date

2008

Mr. Bross is presently assigned to the Electrical Group of the Energy Division. His responsibilities include managing electrical engineers/designers, developing electrical specifications, reviewing contract submittals, and developing electrical construction deliverables, such as electrical plans, lists, and schematics.

Mr. Bross' past projects include the following:

Ottumwa Generating Station AQCS Project – Unit 1, Alliant Energy

Ottumwa, IA 2012-Present

This project includes adding a dry flue gas desulfurization (DFGD) system, pulse-jet fabric filter (PJFF) system, and by-product handling system to a 715MW coal-fired unit. Primary responsibilities include: managing electrical engineers/designers, reviewing vendor submittal documents, designing cable, and developing electrical schematics and lists.

Cooper Retrofit Air Pollution Project – Unit 2, East Kentucky Power Cooperative

Somerset, KY 2009-2012

This project included adding a selective catalytic reduction (SCR) system, dry flue gas desulfurization (DFGD) system, pulse-jet fabric filter (PJFF) system, and fly ash handling system to a 230MW coal-fired unit. Primary responsibilities included: writing electrical specifications, reviewing vendor submittal documents, designing the electrical ground grid, developing cable tray routes, designing duct bank, developing electrical plan drawings, designing and routing cables, and developing electrical schematics and lists. Mr. Bross also served as the field electrical engineer during construction (2011-2012).

Fayette Power Project Scrubber Project – Units 1 & 2, Lower Colorado River Authority

La Grange, TX 2008-2009

This project included adding a wet flue gas desulfurization (FGD) system to two 600MW coal-fired units. Primary responsibilities included: reviewing vendor submittal documents, designing duct bank, developing electrical plan drawings, designing and routing cables, and developing electrical schematics and lists.

3.0 EXPERIENCE

Multi-Pollutant Control Study Experience List

Client and Plants	Unit Size	Pollutants Considered	Technologies Evaluated[1]
Great Plains Energy Hawthorn Montrose Iatan Sibley Lake Road LaCygne	550 MW 3 x 170 MW 750 MW 500 MW 100 MW 2 x 700 MW	NO_x SO_2 and HCl Hg PM	SCR Wet FGD, Dry FGD, DSI AC Injection ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF
Confidential client	44 MW 60 MW 105 MW 203 MW 306 MW	NO_x SO_2 and HCl Hg PM	SCR Wet FGD, Dry FGD, DSI AC Injection ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF
Luminant	2 x 593 MW 3 x 793 MW 2 x 593 MW 793 MW 591 MW	NO_x SO_2 and HCl Hg PM	SCR Wet FGD, Dry FGD, DSI AC Injection ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF
Westar Tecumseh Lawrence Energy Center	82 MW 150 MW 49 MW 114 MW 403 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD, Dry FGD, DSI AC Injection ESP Upgrades, New PJFF
Confidential Client	400 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD upgrades AC Injection, sorbent injection
Jamestown NY Carlson	2 X 24 MW 25 MW 29 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR AC Injection ESP upgrades
Midwest Confidential	300 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD, Dry FGD, DSI AC Injection, ChemMod
Central Iowa Fair Station	25 MW 38 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD, Dry FGD, DSI AC Injection ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF
Southeast Confidential	3000 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD, Dry FGD, DSI AC Injection, Sorbent Hg ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF
Midwest Confidential	2000 MW	NO_x SO_2	SCR, SNCR Wet FGD, Dry FGD
Xcel Tolk Harrington	2 X 568 MW 3 X 360 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD, Dry FGD, DSI AC Injection ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF
South Miss. Coop. Morrow	2 x 200 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Wet FGD upgrade AC Injection ESP Upgrades, New PJFF, Conversion of ESP to PJFF, polishing PJFF

Multi-Pollutant Control Study Experience List

Client and Plants	Unit Size	Pollutants Considered	Technologies Evaluated[1]
Lafayette Utilities System Rodemacher	490 MW	NO_x SO_2 and HCl Hg PM	SCR, SNCR Dry FGD AC Injection PJFF
Hoosier Energy Ratts	2 x 130 MW	NO_x SO_2 Hg PM H_2SO_4	SCR, SNCR Wet FGD, Dry FGD, DSI AC Injection PJFF, new supplemental ESP, new replacement ESP WESP, DSI
Confidential Client Southeastern U.S.	2 x 200 MW	NO_x SO_2 Hg	SCR, IFGR Wet FGD Co-benefits of SCR and wet FGD
City Utilities James River Station Southwest Station	44 MW 56 MW 105 MW 195 MW	NO_x SO_2 Hg	SCR, SNCR, OFA, LNB Wet FGD, Dry FGD AC Injection,
Western Farmers Hugo Mooreland Anadarko	475 MW 45 MW 125 MW 135 MW 2 x 15 MW 44 MW 3 x 100 MW 2 x 45 MW	NO_x SO_2 Hg	SCR, LNB Wet FGD, Dry FGD AC Injection, PJFF
Hoosier Energy Merom Ratts	2 x 540 MW 2 x 130 MW	NO_x SO_2 Hg PM	SCR, SNCR, OFA, LNB Wet FGD, Dry FGD AC Injection, PJFF Bipolar Agglomerator
OG&E Muskogee Sooner	531 MW 562 MW 547 MW 530 MW 539 MW	NO_x SO_2 Hg	SCR, SNCR, OFA, LNB Wet FGD, Dry FGD AC Injection
Confidential Client Southeastern U.S.	86 MW 2 x 258 MW	NO_x SO_2 Hg	SCR Wet FGD Modifications AC Injection, PJFF
Confidential Client Northern U.S.	2 x 75 MW 355 MW 585 MW 2 x 60 MW 3 x 79 MW	NO_x SO_2 Hg	SCR, SNCR, OFA, LNB Wet FGD, Dry FGD, Boiler Lime Injection AC Injection, PJFF
Confidential Client	490 MW 520 MW	NO_x SO_2 Hg	OFA, LNB Wet FGD, Dry FGD AC Injection
Northern Indiana Public Service Company Bailly Mitchell Michigan City Schahfer	194 MW 422 MW 3 x 138 MW 115 MW 540 MW 540 & 556 MW 2 x 424 MW	NO_x SO_2 Hg	SCR, OFA Wet FGD, Dry FGD, Boiler Lime Injection AC Injection, COHPAC, PJFF
Constellation Energy Brandon Shores C.P. Crane H.A. Wagner	2 x 685 MW 2 x 200 MW 133 MW 136 MW 359 MW 415 MW	NO_x SO_2 Hg	SCR, OFA Wet FGD, Dry FGD AC Injection, COHPAC

Multi-Pollutant Control Study Experience List

Client and Plants	Unit Size	Pollutants Considered	Technologies Evaluated[1]
San Miguel Electric San Miguel	410 MW	NO_x SO_2 Hg	SNCR, SCR FGD Upgrade, Fuel Switch Sorbent Injection, COHPAC
Otter Tail Power Big Stone Coyote Hoot Lake	450 MW 450 MW 75 MW 50 MW	NO_x SO_2	SCR, SNCR Wet FGD, Dry FGD
KCP&L Montrose	550 MW	NO_x SO_2 PM Hg	SCR Wet FGD, Dry FGD PJFF, COHPAC Sorbent Injection
City Utilities of Springfield, MO James River Southwest	44 & 60 MW 105 MW 194 MW	NO_x SO_2 Hg	SCR Wet FGD, Dry FGD AC Injection, COHPAC
Empire District Electric Company Asbury	221.5 MW	NO_x SO_2 Hg	SCR, OFA Wet FGD, Dry FGD AC Injection, COHPAC, PJFF
Empire District Electric Company Riverton	38 MW 54 MW	NO_x SO_2 Hg	SCR Wet FGD, Dry FGD AC Injection, COHPAC, PJFF
CLECO Power Dolet Hills Rodemacher Teche	650 MW 440 MW 523 MW 23 MW 48 MW 359 MW	NO_x SO_2 Hg	SCR, OFA, LNB Wet FGD, Dry FGD AC Injection, COHPAC, PJFF
Wisconsin Public Service Pulliam Weston Columbia Edgewater	2 x 30 MW 50 & 60 MW 75 & 125 MW 60 & 75 MW 125 MW 2 x 511 MW 330 MW	NO_x SO_2 Hg	SCR, OFA, LNB Wet FGD, Dry FGD AC Injection, COHPAC
Associated Electric Thomas Hill	1 x 175 MW 1 x 275 MW 1 x 670 MW	NO_x SO_2 Hg	SCR Wet FGD, Dry FGD Sorbent injection, COHPAC
Associated Electric New Madrid	2 x 600 MW	SO_2 Hg	Dry FGD Sorbent injection , COHPAC
Associated Electric Chamois	52 MW	NO_x Hg	OFA Sorbent Injection, COHPAC
TMPA Gibbons Creek	440 MW	SO_2 Hg	Wet FGD, Dry FGD AC Injection, Spray Cooling, COHPAC
Minnkota Power Milton R. Young	250 MW 450 MW	NO_x SO_2 Hg	SCR, OFA Wet FGD, Dry FGD AC Injection, Spray Cooling, COHPAC, PJFF
KCP&L LaCygne	2 x 750 MW	NO_x SO_2 PM Hg	SCR, OFA Wet FGD, Dry FGD PJFF, WESP AC Injection, SCR / FGD
City of San Antonio Deely	2 x 450 MW	SO_2 PM	Wet FGD, Dry FGD COHPAC, RGFF, PJFF
Basin Electric Leland Olds	440 MW 216 MW	NO_x SO_2 PM Hg	SCR Wet FGD, Dry FGD, Fuel Switch PJFF AC Injection

Multi-Pollutant Control Study Experience List

Client and Plants	Unit Size	Pollutants Considered	Technologies Evaluated[1]
Gainesville, Florida Deerhaven	235 MW	NO_x SO_2 PM Hg CO_2	SCR, SNCR Wet FGD, Dry FGD PJFF AC Injection, COHPAC Capture/Sequestration

[1] Acronyms used in this table include
AC = Activated Carbon Injection
COHPAC = Compact Hybrid Particulate Collector (a high air-to cloth ratio pulse jet fabric filter)
DSI = Dry Sorbent Injection
ESP = Electrostatic Precipitator
FGD = Flue Gas Desulfurization
IFGR = Induced Flue Gas Recirculation
LNB = Low NO_x Burners
OFA = Overfire Air
PJFF = Pulse Jet Fabric Filter
RGFF = Reverse Gas Fabric Filter
SCR = Selective Catalytic Reduction
SNCR = Selective Non-Catalytic Reduction
WESP = Wet Electrostatic Precipitator

Unit Name	Project Type	Project Development	Project Definition	Specification Preparat	Technical Assessmer	Feasibility Study	Environmental Study	Detailed Design	Construction Manage	Construction/Field Se	Startup/Testing	EPC Specifications
Decatur Cogen Unit 1	New Unit Baghouse			X								
Decatur Cogen Unit 2	New Unit Baghouse			X								
Warrick Power Plant, Units 1, 2, & 3	SNCR			X				X		X		
Nelson Dewey Units 1 & 2	OFA Air Evaluation	X	X	X								
Edgewater Unit 4	OFA Air Evaluation	X	X	X				X		X	X	
Venice Plant Boilers 7 & 8	NOx Reduction							X			X	
Gorsuch Generating Units 1 -4	NO_x reduction, Boiler and Mill Testing, Low NO_x burner specification, bid evaluation and consulting services	X	X	X	X	X					X	
Apache Station Unit 2	New Unit Precipitator			X				X		X		
Apache Station Unit 3	New Unit Precipitator			X				X		X		
Cholla 4	New Baghouse to Existing Unit; Replacement w Baghouse; Retire Existing Precipitaor			X				X		X		
Cholla 3	New Baghouse to Existing Unit; Replacement w Baghouse; Retire Existing Precipitaor			X				X		X		
New Madrid Units 1 & 2	OFA	X	X	X	X	X		X	X	X	X	
New Madrid Units 1 & 2	Fuel conversion, combustion improvements, inspections, testing										X	
Thomas Hill Units 1, 2, & 3	Overfire air design and installation, burner inspection, combustion optimization							X			X	
Thomas Hill Unit 2	NOx Reduction	X	X	X	X	X		X	X	X	X	
Thomas Hill Unit 3	New Unit Precipitator			X				X		X		
Laramie River Station Unit 1	New Unit Precipitator			X				X		X		
Laramie River Station Unit 2	New Unit Precipitator			X				X		X		
Laramie River Station Unit 3	New Unit Precipitator			X				X		X		
Leland Olds, Unit 1 & 2	SNCR	X	X	X	X	X	X	X		X	X	
Laramie River Station Unit 1	CFD modeling, air flow modeling, existing burner evaluation	X	X	X	X			X	X	X	X	
Station 2 Units 1 & 2	Combustion improvement program, testing and mill evaluation.				X						X	
HMP&L Units 1 & 2	NOx Reduction					X					X	
R.W. Miller Units 1, 2, & 3	SNCR	X			X							
North Texas Unit 3	SNCR	X			X							
R.W. Miller Units 1, 2, & 3	NO_x reduction evaluation, evaluation of burner technologies, overfire air, IFGR, SCR, SNCR, hybrid, reburn	X	X	X	X	X						
Unit 7 & 8	Burner evaluation, CFD Modeling, specification development, bid evaluation for LNB and OFA systems	X				X						
Spruce Unit 1	New Unit Baghouse			X				X		X		
Spruce Unit 2	New Unit Baghouse			X				X		X		
	New Baghouse to Existing Unit; Replacement w Baghouse;											

	Unit Name	Project Type	Project Development	Project Definition	Specification Preparat	Technical Assessmer	Feasibility Study	Environmental Study	Detailed Design	Construction Manage	Construction/Field Se	Startup/Testing	EPC Specifications
	Deely Unit 2	New Baghouse to Existing Unit; Replacement w Baghouse; Retire Existing Precipitaor			X				X		X		
	Sikeston Power Station Unit 2	New Unit Precipitator			X				X		X		
ipal Utilities	Sikeston Power Station Unit 1	NOx reduction strategy evaluation.	X				X						
	Southwest Power Station Unit 1	New Unit Precipitator			X				X		X		
	Dallman Units 31, 32, & 33	OFA Air Evaluation				X	X						
	Lakeside Boilers 7 & 8	OFA Air Evaluation	X	X	X	X	X						
ıgfield	Dallman Unit 33	New Unit Precipitator			X				X		X		
	Martin Drake Station Units 5, 6, & 7	NOx Reduction			X			X	X			X	
	Martin Drake Units 5, 6, & 7	PC/Gas Fired, NO_x reduction, Low NO_x burners, combustion improvements, startup and training	X	X	X	X				X	X	X	
	Edison's Powerton Boiler 6	NOx Reduction	X	X	X	X	X		X	X	X	X	
	Earl Wisdom Station Unit 1	Low NO_x Burner consulting and troubleshooting				X						X	
	Bonanza Unit 1	New Unit Baghouse			X				X		X		
	Cooper Unit 2	New Baghouse to Existing Unit; Replacement w Baghouse; Retire Existing Precipitaor			X				X		X		
	Riverton Power Plant Units 39 & 40	NO_x reduction evaluation, testing, overfire air installation.	X	X	X	X				X	X	X	
	Asbury Power Plant Units 1 & 2	NO_x reduction evaluation, testing, overfire air installation.	X	X	X	X				X	X	X	
	Asbury Power Plant	NOx Reduction	X	X	X	X			X	X	X	X	
	Monroe Station 10, 11, & 12	NO_x reduction evaluation, evaluation of burner technologies, Low NO_x burner specifications, IFGR, BACT analysis	X	X	X	X	X						
	Louisiana 2 Units 10, 11, & 12	NO_x reduction evaluation, evaluation of burner technologies, IFGR, Low NO_x burner specifications, BACT analysis	X	X	X	X	X						
	Deerhaven Unit 2	New Unit Precipitator			X				X		X		
	Deerhaven Unit 2	Overfire air, combustion tuning, startup assistance. Air pollution control evaluation looking at NO_x, SO_2, mercury and particulate emission reduction				X	X		X			X	
	Olinger Station Unit 2	LNB conversion, OFA addition				X	X						
	Merom Unit 1	New Unit Precipitator; Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X				X		X		
	Merom Unit 2	New Unit Precipitator; Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X						X		
	Frank E. Ratts Unit 1	Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X								

	Unit Name	Project Type	Project Development	Project Definition	Specification Preparat	Technical Assessmer	Feasibility Study	Environmental Study	Detailed Design	Construction Manage	Construction/Field Se	Startup/Testing	EPC Specifications
	Frank E. Ratts Unit 1	Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X								
	Frank Ratts Station Units 1 & 2	NOx Reduction			X	X	X		X				
	Unit 1	New Unit Baghouse			X				X		X		
	Unit 2	New Unit Baghouse			X				X		X		
	Nearman Creak Station Unit 1	NOx Reduction	X	X	X	X	X					X	
ies	Quindaro 1	Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X				X		X		
	Hawthorn Unit 5	New Unit Baghouse			X				X		X		
	Iatan Unit 2	New Unit Baghouse			X				X		X		
	LaCygne Unit 1	NOx Reduction	X	X	X	X			X			X	
	Iatan Generating Station Unit 1	Replacement burner specification, support for LNB retrofit with overfire air, CFD Modeling support, economizer surface additions, burner row relocation evaluation, construction monitoring	X	X	X	X	X				X	X	
	La Cygne Unit 1	overfire air and combustion improvement program,	X	X	X	X	X		X			X	
	Hawthorn Unit 5	performance testing, NO_x reduction options evaluation				X	X					X	
	Lake Road Unit 4	SNCR	X			X							
	Montrose, Unit 1, 2, & 3	SNCR	X			X							
	Iatan Unit 1	New Baghouse to Existing Unit			X				X		X		
	Martin Lake Power Plant Unit 1	SNCR							X				
	Martin Lake Power Plant Unit 2	SNCR							X				
	Martin Lake Power Plant Unit 3	SNCR							X				
	Oak Grove Unit 1	New Unit Baghouse									X		
	Oak Grove Unit 2	New Unit Baghouse			X				X				
	Louisa Unit 1	Conversion to Baghouse; Replacement w Baghouse; Retire Existing Precipitator; New Baghouse to Existing Unit			X				X		X		
	Walter Scott Jr. Energy Center Unit 4	New Unit Baghouse			X				X		X		
	Walter Scott Jr. Energy Center Unit 3	Conversion to Baghouse; Replacement w Baghouse; Retire Existing Precipitator; New Baghouse to Existing Unit			X						X		
	Neal North Unit 2	Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X						X		
	Neal North Unit 3	Precipitator Rebuild or Refurbish; Structural Inspection/Evaluation			X						X		
	Neal South Unit 4	Hot to Cold Side Precipitaor Conversion; Structural Inspection / Evaluation			X						X		

Unit Name	Project Type	Project Development	Project Definition	Specification Preparat	Technical Assessmer	Feasibility Study	Environmental Study	Detailed Design	Construction Manage	Construction/Field Se	Startup/Testing	EPC Specifications
Walter Scott Jr. Energy Center Unit 3	Hot to Cold Side Precipitaor Conversion; Structural Inspection / Evaluation			X				X		X		
Neal Station Units 2 & 3	NOx Reduction											X
Boswell 3	New Baghouse to Existing Unit			X				X		X		
Laskin Units 1 & 2	technical spec, bid evaluation, combustion system replacement, NOx reduction, SOFA addition, startup, tuning and commissioning consultation	X	X	X	X	X			X	X	X	
Boswell Energy Centers Units 3 & 4	technical spec, bid evaluation, combustion system replacement, NOx reduction, SOFA addition	X	X	X	X	X			X	X	X	
Milton R. Young Units 1 & 2	OFA	X	X	X	X	X			X	X	X	
Milton R. Young, Unit 1	SNCR			X				X		X	X	
Milton R. Young, Unit 1 & 2	SNCR	X	X	X	X	X	X	X		X	X	
Milton R. Young, Unit 1 & 2	SNCR	X	X	X	X	X	X	X		X	X	
Gerald Gentleman Unit 1	Burner Evaluation, Burner Design Replacement	X	X	X	X			X		X	X	
Sheldon Station Units 1 & 2	Combustion assessment, OFA design and installation support, primary air improvements	X	X	X	X			X	X	X	X	
Schahfer Unit 15	Nox Reduction evaluation, LNB & OFA Retrofit, CFB Modeling	X	X	X	X			X		X	X	
Michigan City 12	NOx reduction evaluation and overfire air systems	X	X	X	X	X		X		X	X	
Schahfer Unit 14	NOx reduction evaluation and overfire air systems				X	X						
Bailey 8	NOx reduction evaluation and overfire air systems				X	X						
Indian River Unit 3	Replacement w Baghouse; Retire Existing Precipitator; New Baghouse to Existing Unit			X				X		X		
Indian River Unit 4	Replacement w Baghouse; Retire Existing Precipitator; New Baghouse to Existing Unit			X				X		X		
Clover Power Station Unit 1	New Unit Baghouse			X				X		X		
Clover Power Station Unit 2	New Unit Baghouse											
Waste to Energy Facility Unit 1	New Baghouse to Existing Unit											
Waste to Energy Facility Unit 2	New Baghouse to Existing Unit			X				X		X		
Hoot Lake Generating Station Unit 3	Burner evaluation, burner design and replacement, Overfire air design and installation	X	X	X	X			X	X	X	X	
Huntington Unit 1	New Unit Precipitator			X						X		
Huntington 2	Structural Inspection/ Evaluation; Conversion to Baghouse			X				X				
Prairie State Unit 1	New Unit Precipitator											
Prairie State Unit 2	New Unit Precipitator			X								
Escalante Unit 1	New Unit Baghouse			X				X				
	NO_x reduction evaluation including combustion modifications											

	Unit Name	Project Type	Project Development	Project Definition	Specification Preparat	Technical Assessmer	Feasibility Study	Environmental Study	Detailed Design	Construction Manage	Construction/Field Se	Startup/Testing	EPC Specifications
	Colstrip Unis 1 & 2	SNCR	X			X							
	Crystal River Unit 4	New Unit Precipitator; Precipitator Rebuild or Refurbish			X				X		X		
	Crystal River Unit 5	New Unit Precipitator; Precipitator Rebuild or Refurbish			X				X		X		
	Gibson Unit 1 and 2	Precipitator Rebuild or Refurbish; Structural Inspection/ Evaluation			X				X				
	Gibson Generating Station Units 1 - 4	Testing, combustion improvement program, Pulverizer improvements, Low NO_x burners, overfire air, tuning and startup	X	X	X	X	X					X	
	P500 Unit 1	New Unit Baghouse			X				X		X		
	P500 Unit 2	New Unit Baghouse											
	P500 Unit 3	New Unit Baghouse			X				X		X		
	Seward Boiler #1	New Baghouse to Existing Unit			X								
	Seward Boiler #2	New Baghouse to Existing Unit			X								
	Silver Lake Plant Unit 4	NOx Reduction			X				X			X	
	Unit 1	CFD Modeling, OFA automation retrofit, boiler tuning, new air flow, Neural network implementation, primary air flow and OFA air flow instrumentation, operator training for isokinetic sampling	X	X	X	X			X	X	X	X	
	Unit 1	NO_x reduction evaluation, SCR evaluation, Low NO_x burners and overfire air evaluation	X			X	X						
	San Miguel, Unit 1	SNCR			X				X		X		
	Cogen Plant Unit 1	New Baghouse to Existing Unit			X								
tion	RD Morrow Unit 1 and 2	New Unit Precipitator			X				X		X		
	Marion Unit 4	New Unit Precipitator			X				X		X		
	Milton R. Young, Unit 2	SNCR	X	X	X	X	X	X	X		X	X	
	Coronado Station Unit 2	Windbox modifications, Installation, Inspection, tuning, startup assistance				X			X			X	
	Coronado Station Unit 2	NOx Reduction							X				
	Gibbobs Creek Unit 1	Performance improvement, fuel switching evaluation, combustion improvement, NO_x Reduction	X			X	X						
	Gibbon Creek Unit 1	NOx Reduction	X	X		X	X					X	
	Red Hills Boiler #1	New Baghouse to Existing Unit			X								
	Red Hills Boiler #2	New Baghouse to Existing Unit			X				X		X		
	Craig Station Unit 1	Replacement w Baghouse; Retire Existing Precipitator			X				X		X		

	Unit Name	Project Type	Project Development	Project Definition	Specification Preparat	Technical Assessmer	Feasibility Study	Environmental Study	Detailed Design	Construction Manage	Construction/Field Se	Startup/Testing	EPC Specifications
ıp.	Craig Station Unit 3	EPC complete LNB & OFA Replacement, CFD Modeling	X	X	X	X			X		X	X	
ıp.	Craig Station Units 1 & 2	Burner evaluation, specification, support for LNB retrofit with overfire air	X	X	X	X	X			X	X	X	
ıp.	Craig Station Unit 3	SNCR	X	X	X				X		X	X	
	Meramec Unit 4	Low NO_x Burner Specifications, installation engineering, furnace inspections and combustion improvements			X	X						X	
	Unit 10	New Baghouse to Existing Unit			X				X				
	Units 7,8,9	New Baghouse to Existing Unit			X								
	Lawrence Energy Center 1 & 2				X				X		X		
	Hugo Unit 1	New Unit Precipitator											
	Hugo Unit 1	Replacement burner specification, support for LNB retrofit with overfire air, convection pass replacement, burner row relocation evaluation, furnace slagging evaluation	X	X	X	X	X			X	X	X	

Burns McDonnell Electrostatic Precipitator and Baghouse Experience

Client	Unit Name	ACFM	MW	Project In Service Date	New Unit Precipitator	Hot to Cold Side Precipitator Conversion	Precipitator Rebuild or Refurbish	Structural Inspection/Evaluation	Conversion to Baghouse	Replacement w Baghouse; Use Precip as Ash Collector	Replacement w Baghouse; Retire Existing Precipitator	New Unit Baghouse	New Baghouse to Existing Unit	Detailed Design	Specification Preparation	Owner's Engineer	Construction/Field Services	
AE Staley Manufacturing Co.	Decatur Cogen Unit 1	188,000	45	1989								X		X	X		X	Environmental Elements
AE Staley Manufacturing Co.	Decatur Cogen Unit 2	188,000	45	1989								X		X	X		X	Environmental Elements
Arizona Electric Power Cooperative, Inc.	Apache Station Unit 2	743,000	194	1978	X									X	X		X	UOP - Air Correction - Weighted Wire
Arizona Electric Power Cooperative, Inc.	Apache Station Unit 3	743,000	194	1979	X									X	X		X	UOP - Air Correction - Weighted Wire
Arizona Public Service Company	Cholla 4	2,300,000	380	2009							X		X	X	X		X	Hamon Research-Cottrell
Arizona Public Service Company	Cholla 3	1,850,000	315	2008							X		X	X	X		X	
Associated Electric Cooperative, Inc.	Thomas Hill Unit 3	3,110,000	670	1983	X									X	X	X	X	Peabody Rigid Frame
Basin Electric Power Cooperative	Laramie River Station Unit 1	3,211,000	570	1980	X									X	X		X	Babcock & Wilcox Rigid Frame
Basin Electric Power Cooperative	Laramie River Station Unit 2	3,211,000	570	1981	X									X	X		X	Babcock & Wilcox Rigid Frame
Basin Electric Power Cooperative	Laramie River Station Unit 3	3,211,000	580	1982	X									X	X		X	Babcock & Wilcox Rigid Frame
City of Sikeston	Sikeston Power Station Unit 2	918,000	235	1981	X									X	X		X	Babcock & Wilcox Rigid Frame
City of Public Service San Antonio	Deely Unit 1	1,800,000	446	2007							X		X		X	X	X	Wheelabrator
City of Public Service San Antonio	Deely Unit 2	1,800,000	446	2007							X		X		X	X	X	Wheelabrator
City of Public Service San Antonio	Spruce Unit 1	2,600,000	750	2009								X				X		Alstom
City of Public Service San Antonio	Spruce Unit 2	2,600,000	750	2009								X			X	X		Alstom
City Utilities of Springfield	Southwest Power Station Unit 1	864,000	195	1976	X									X	X		X	UOP - Air Correction - Weighted Wire
City Water, Light and Power, City of Springfield	Dallman Unit 33	890,000	192	1978	X									X	X		X	UOP - Air Correction Weighted Wire
Deseret	Bonanza Unit 1	1,850,000	400	1986								X		X	X		X	Ecolaire
East Kentucky Power Cooperative	Cooper Unit 2	754,000	230	2012							X		X	X	X		X	
Gainesville Regional Utilities	Deerhaven Unit 2	917,000	233	1987	X													Research Cottrell Weighted Wire
Hoosier Energy	Frank E. Ratts Unit 1	490,000	117	2012			X	X							X	X		
Hoosier Energy	Frank E. Ratts Unit 1	490,000	117	2012			X	X							X	X		
Hoosier Energy	Merom Unit 1	1,850,000	540	2011	X		X	X						X	X	X	X	
Hoosier Energy	Merom Unit 2	1,850,000	540	2011	X		X	X						X	X	X	X	
Iowa State University Physical Plant	Unit 1	84,000	18	1988								X		X	X		X	Brandt Environmental
Iowa State University Physical Plant	Unit 2	84,000	18	1988								X		X	X		X	Brandt Environmental
Kansas City Kansas Board of Public Utilities	Quindaro 1	545,000	82	1999			X	X						X	X		X	
Kansas City Power & Light	Hawthorn Unit 5	1,778,000	560	2001								X		X	X		X	Babcock & Wilcox
Kansas City Power & Light	Iatan Unit 2		850	2010								X		X	X		X	Alstom
KCPL	Iatan Unit 1	2,500,000	730	2010									X	X	X		X	Alstom
Luminant (formerly TXU Power)	Oak Grove Unit 1		860	2010								X			X	X		
Luminant (formerly TXU Power)	Oak Grove Unit 2		860	2011								X			X	X		
MidAmerican Energy	Louisa Unit 1	3,176,000	700	2008				X		X			X	X	X		X	Alstom
MidAmerican Energy	Neal North Unit 2	1,086,000	350	1995			X	X						X	X		X	
MidAmerican Energy	Neal North Unit 3	1,800,000	550	1995			X	X						X	X		X	
MidAmerican Energy	Neal South Unit 4	2,084,000	650	1996		X		X						X	X		X	
MidAmerican Energy	Walter Scott Jr. Energy Center Unit 3	3,176,000	700	2009				X		X			X	X	X		X	Alstom
MidAmerican Energy	Walter Scott Jr. Energy Center Unit 3	3,176,000	700	1996		X		X						X	X		X	
MidAmerican Energy	Walter Scott Jr. Energy Center Unit 4	3,100,000	790	2006								X				X	X	Babcock & Wilcox
Minnesota Power	Boswell 3	1,396,000	350	2009									X	X	X	X		Hamon Research-Cottrell
NRG Energy	Indian River Unit 3	525,000	177	2011							X		X	X	X		X	
NRG Energy	Indian River Unit 4	1,956,700	442	2011							X		X	X	X		X	
Old Dominion Electric Cooperative	Clover Power Station Unit 1	795,000	424	1995								X			X	X	X	Combustion Engineering
Old Dominion Electric Cooperative	Clover Power Station Unit 2	795,000	424	1996								X			X	X	X	Combustion Engineering
Olmstead County	Waste to Energy Facility Unit 1	23,000	100 TPD	2002									X		X	X	X	Hamon Research-Cottrell
Olmstead County	Waste to Energy Facility Unit 2	23,000	100 TPD	2002									X		X	X	X	Hamon Research-Cottrell
PacifiCorp	Huntington 2	2,200,000	475	2007				X	X					X	X		X	Hamon Research-Cottrell
PacifiCorp	Huntington Unit 1	1,742,000	500	1977	X									X	X		X	

Burns McDonnell Electrostatic Precipitator and Baghouse Experience

Client	Unit Name	ACFM	MW	Project In Service Date	New Unit Precipitator	Hot to Cold Side Precipitator Conversion	Precipitator Rebuild or Refurbish	Structural Inspection/Evaluation	Conversion to Baghouse	Replacement w Baghouse; Use Precip as Ash Collector	Replacement w Baghouse; Retire Existing Precipitator	New Unit Baghouse	New Baghouse to Existing Unit	Detailed Design	Specification Preparation	Owner's Engineer	Construction/Field Services	
Peabody Energy	Prairie State Unit 1		800	2011	X									X	X		X	
Peabody Energy	Prairie State Unit 2		800	2012	X									X	X		X	
Plains Electric G&T	Escalante Unit 1	1,362,000	233	1985								X		X	X		X	GE
Progress Energy	Crystal River Unit 4	2,348,000	740	2010	X		X									X		
Progress Energy	Crystal River Unit 5	2,348,000	740	2010	X		X									X		
PSI Energy (Now Duke Energy)	Gibson Unit 1 and 2	4,560,000	1340	1990/1991			X	X						X	X		X	
Puget Sound Naval Shipyard	P500 Unit 1	57,000	15									X		X	X			GE
Puget Sound Naval Shipyard	P500 Unit 2	57,000	15									X		X	X			GE
Puget Sound Naval Shipyard	P500 Unit 3	57,000	15									X		X	X			GE
South Mississippi Electric Power Association	RD Morrow Unit 1 and 2	1,664,000	406	1978	X									X	X		X	Buell-Envirotech Weighted Wire
Southern Illinois Power Cooperative	Marion Unit 4	625,000	173	1978	X													Babcock & Wilcox Rigid Frame
Schuylkill Energy Resources	Cogen Plant Unit 1	438,500	100	1982								X		X	X		X	CE Air Preheater
Tractebel	Red Hills Boiler #1	859,000	260	2002								X			X	X		Brandt Environmental
Tractebel	Red Hills Boiler #2	859,000	260	2002								X			X	X		Brandt Environmental
Reliant Energy	Seward Boiler #1	868,560	260	2004								X			X	X		Alstom
Reliant Energy	Seward Boiler #2	868,560	260	2004								X			X	X		Alstom
Tri-State	Craig Station Unit 1	2,033,000	450	2004							X			X	X	X	X	Hamon Research-Cottrell
Tri-State	Craig Station Unit 2	2,033,000	450	2004							X			X	X	X	X	Hamon Research-Cottrell
University of Missouri-Columbia	Unit 10	156,000	21									X		X	X			Carborundum
University of Missouri-Columbia	Units 7,8,9	125,000	30									X		X	X			Carborundum
Westar Energy	Lawrence Energy Center1 & 2		566												X			
Western Farmers Electric Cooperative	Hugo Unit 1	2,000,000	400	1982	X									X	X	X	X	Babcock & Wilcox Rigid Frame

Station Two Units 1 & 2

Henderson, KY

AQCS Owner's Engineer

Client

Henderson Municipal Power & Light Company
100 Fifth Street
PO Box 8
Henderson KY 42419-0008
(270) 826-2726

Owner's Engineer
Selective Catalytic Reduction (SCR) Project
Addition of Selective Catalytic Reduction (SCR) systems on Station Two Unit 1 (165 MW) & Unit 2 (172 MW)

Completion Date

May 2004

Cost

$40 Million

Project Manager

Dave Pattison

Services Provided

- Project management
- Owner's engineer
- Resident engineering services during construction and startup
- Project estimating and scheduling
- Financing assistance
- Contract administration

Project Summary

Burns & McDonnell provided engineering services to assist Henderson Municipal Power & Light (HMP&L) in its efforts to add Selective Catalytic Reduction (SCR) systems for control of nitrogen oxide (NO_x) emissions at Station Two, Units 1 and 2. Station Two is a coal-fired, steam electric generating station. Unit 1 is rated at 165 MW (gross) and Unit 2 is rated at 172 MW (gross). Burns & McDonnell's scope included project management, performance specifications for the SCR systems, detailed design of the SCR foundations, and bid evaluation. Burns & McDonnell also acted as the Owner's Engineer.

Project Features/Results

- Two SCR reactors (one for each boiler)
- Anhydrous ammonia injection and storage system
- Air heater modifications

Project Background and Description

The U.S. EPA published a final rule, the NO_x SIP call, which required 22 states and the District of Columbia to submit state implementation plans (SIPs) to address the regional transport of ground-level ozone. The NO_x SIP call required the reduction of NO_x during the "ozone season" (May 1 through September 30) each year. Compliance with the rule was required starting in May 2004. Various multi-pollutant control bills proposed in Congress called for the year-round reduction of NO_x emissions.

The NO_x SIP call required HMP&L to reduce NO_x emissions at Station Two to a level that could not be achieved without a Selective Catalytic Reduction (SCR) system. The Unit 1 SCR system was completed in November 2003 and the Unit 2 SCR system was completed in May 2004.

Station Two Units 1 & 2

Henderson, KY

Detailed Design Air Quality Control Systems Project

Client

Henderson Municipal Power & Light Company
100 Fifth Street
PO Box 8
Henderson KY 42419-0008
(270) 826-2726

Station Two
FGD Retrofit Project
Addition of Magnesium Enhanced Lime Flue Gas Desulfurization (FGD) systems on Station Two Unit 1 (165 MW) and Unit 2 (172 MW)

Completion Date

September 1995

Cost

Approximately $45 million

Project Manager

Fred Campbell

Services Provided

- A minimum SO_2 removal efficiency of 95 percent
- Single stainless steel FGD module per unit (tray tower design)
- A new chimney with two brick flues for wet flue gas
- FGD bypass is through the existing chimney

Project Summary

Burns & McDonnell provided engineering services to Henderson Municipal Power & Light Company (HMPL) for this FGD retrofit project. Burns & McDonnell's scope included project management, specifications for the FGD system, detailed design of the foundations, bid evaluations, contract administration, and field services.

Project Features

- A minimum SO_2 removal efficiency of 95 percent
- Single stainless steel FGD module per unit (tray tower design)
- A new chimney with two brick flues for wet flue gas
- FGD bypass is through the existing chimney

Project Background and Description

Station Two is a coal-fired steam electric generating station, installed in 1973, owned by HMPL, and operated by Big Rivers Electric Corporation (BREC). The site is shared by six generating units, Station Two – 2 units, Reid Station – 1 unit, Green Station – 2 units, and one gas turbine. The Green Station was equipped with magnesium enhanced lime FGD systems. The FGD retrofit project for Station Two began in the fall of 1992 as part of HMPL/BREC's compliance plan to meet the Phase I SO_2 requirements of Title IV of the Clean Air Act Amendments of 1990.

The project required that a single stainless steel absorber module be added for each unit. The existing units were forced draft, and booster fans were installed to overcome the pressure drop added by the FGD system. A single dual flue chimney was provided to exhaust the wet flue gas from the FGD systems. The capacity of the existing lime handling and preparation system for the Green Station was expanded to include the Station Two units. The capacity of the sludge dewatering system for Green Station was also expanded.

Due to the large scope of work the FGD retrofit project was divided into six individual contracts that generally included:

- Wet lime FGD system
- Site preparation
- Chimney piling
- Foundations
- Miscellaneous construction
- Site cleanup and grading

4.0 COMMERCIAL

Commerical

Within this section, we have provided commercial information that frames an agreement between Burns & McDonnell and Big Rivers and will provide additional commercial-related information for your evaluation such as Safety Statistics and Financial Information. We have conformed, to the best of our ability, to the request and correspondence with Big Rivers during the proposal development process.

Safety

Burns & McDonnell is committed to safety up to and including our CEO, Greg Graves. We take this commitment very seriously, starting each Burns & McDonnell meeting with a brief safety discussion … and our safety record substantiates this commitment. Burns & McDonnell believes this to be THE most important aspect to any project. It is imperative that all project participants go home to their loved ones at the end of the work day, functioning the same as they began.

Although not specifically requested, we have provided safety information within for Burns & McDonnell and the personnel and subcontractors we manage onsite. We are confident you will find we are in the top of the class on safety, and in many cases beat the stringent CII (Construction Industry Institute) averages. Should you need additional information related to safety, please contact Scott Strawn at 816-823-7153.

Financial Strength

As it has not been requested, Burns & McDonnell has not included financials. However, Burns & McDonnell is rock-solid financially, with bonding capacity in excess of **$1 Billion** Aggregate and **ZERO DEBT**. Although not as important on this type of project, it would make me feel comfortable as an owner to know that I was working with a financially stable, self-sufficient company on this important assignment. Most of our competitors cannot boast that statement. The financial strength that we enjoy is indicative of a well-run organization that repeatedly delivers projects on time, on budget, and within performance criteria.

Terms and Conditions & Price

Burns & McDonnell proposes to perform the engineering services described within this proposal on the MATS Compliance Proposal in accordance with our existing general services agreement with Big Rivers dated April 26, 2010 for a not to exceed fee of $675,000 under the existing pricing schedule agreement. We have estimated approximately 5,000 manhours to complete this effort.

Exceptions and Clarifications

Please see the attached exceptions and clarifications spreadsheet as a basis of our proposal.

ASSUMPTIONS, CLARIFICATIONS AND EXCEPTIONS

Project Name.: Big Rivers MATS Compliance Project

Contract:

Bidder : Burns & McDonnell Engineering

Current Date: 5/13/2013

Item No.	Clarifications & Exceptions
1	Burns & McDonnell assumes commercial negotiations will be led by Big Rivers for the MATS Compliance Project.
2	Burns & McDonnell has assumed that spare breakers are available in the existing auxiliary electrical systems to power the new loads associated with the DSI and ACI systems. We have not included a load flow or short circuit study.
3	Burns & McDonnell will develop the vendor specifications for the DSI / ACI system such that the vendor provides a stand alone electrical system with one power source to each system provided by Others.
4	Burns & McDonnell's modifications to the existing control systems will include making modifications to implement the communication interfaces to the new vendor provided PLC systems. These modifications will be made consistent with the existing system, but do not involve an update or upgrade to the overall existing system to meet current codes or practices. We have not included a comprehensive review or upgrade of the existing control systems to make them conform as a whole to current applicable codes or recommended practices.
5	As performed on previous Big Rivers projects, Burns & McDonnell will develop a Level 1 Project milestone-based schedule and utilize the detailed information provided by the equipment supplier and construction contractor to incorporate into the Level 1 schedule.
6	Burns & McDonnell has not included any underground site investigations or geotechnical scope within this proposal. Burns & McDonnell assumes that any geotechnical investigations and reports required for the project will be provided by Big Rivers.
7	Burns & McDonnell has assumed the existing plant ground grids are adequate and will provide acceptable step and touch potential voltages.
8	Burns & McDonnell has assumed the vendor provided systems will have standalone PLC control systems. Each Units DCS will have a communication interface to the PLC for limited supervisory monitoring.
9	Burns & McDonnell has not included any design or specifications of any new buildings and/or additions.
10	Burns & McDonnell assumes that fire protection systems and / or studies, if required, will be performed by Others.
11	Additions and modifications to the existing DCS are assumed to be minor and therefore DCS factory testing is not included. Hours for a design review meeting with Owner have been included.

Big Rivers Electric Corporation
PROFESSIONAL SERVICES AGREEMENT

This Professional Services Agreement (this "Professional Services Agreement") is made this 29th day of June, 2010 by and between Big Rivers Electric Corporation ("Company") and Burns & McDonnell Engineering Co. ("Contractor"), a Missouri Corporation

WHEREAS, Contractor desires the opportunity to provide professional engineering services to Big Rivers Electric Corporation from time to time, and Big Rivers Electric Corporation desire the opportunity to engage Contractor to provide such goods and/or services; and

WHEREAS, the parties intend that this Professional Services Agreement sets forth the exclusive set of terms and conditions which shall govern the performance of the "Work" (as defined below) by Contractor for the Company should the Company engage Contractor to provide Work.

NOW THEREFORE, in consideration of the premises, the mutual covenants contained herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties do agree as follows:

ARTICLE 1 DEFINITIONS

1.01 **Agreement:** "Agreement" shall mean this Professional Services Agreement, along with any "Specifications, (as defined below) and/or Purchase Order (as defined below) issued by Company and/or ", etc any other documentation as may be executed by the parties in accordance with Article 2, and/or other agreed collateral document pursuant to which the Work is to be performed.

1.02 **Applicable Laws:** "Applicable Laws" shall mean any and all applicable federal, state, or local laws, regulations, codes, ordinances, administrative rules, court orders, permits or executive orders.

1.03 **Contract Price:** "Contract Price" shall mean the aggregate of the particular consideration set forth in one or more Purchase Orders or other Statements of Work or as otherwise agreed upon. Unless otherwise agreed in writing, the Contract Price includes all applicable taxes, duties, fees, and assessments of any nature, including without limitation all sales and use taxes, due to any governmental authority with respect to the Work.

1.04 **Contractor:** "Contractor" shall mean the entity designated as the "Contractor" in the opening paragraph of this Agreement.

1.05 **Company:** "Company" shall mean Big Rivers Electric Corporation

1.06 **Purchase Order:** Company may, at its discretion, issue its own "Purchase Order Standard Terms and Conditions" (collectively referred to as a "Purchase Order") that may supplement, but in no way or manner ever supersede, this Agreement with respect to any conflicting terms and conditions.

1.07 **Specifications:** "Specifications" shall mean any specifications, instructions, drawings, schedules, a Purchase Order, contracts, scopes of work, and/or statements of work.

1.08 **Work:** "Work" shall include those services and/or goods set forth in this Agreement.

1.09 **Tools and Equipment:** "Tools and Equipment" shall mean any tools, equipment, rigging and other general supplies on the Company's premises where the Work is being performed that is either owned and/or leased by Company or by any of its Affiliates.

ARTICLE 2 SCOPE; BINDING EFFECT

Unless otherwise agreed in a writing executed by each of the parties which evidences a clear intention to supersede this Agreement, the parties intend that this Agreement apply to all transactions which may occur between the Company on one hand and Contractor on the other hand during the term of this Agreement and

which are related to the provision of goods and/or services by Contractor for the benefit of the Company. Neither the Company makes any commitment to Contractor as to the exclusiveness of this relationship or as to the volume, if any, of business the Company will do with Contractor. The parties do, however, anticipate that the parties will agree from time to time for the performance of Work by Contractor. Such agreement for the provision of Work shall be reflected by (a) each of the parties executing a mutually acceptable Statement of Work under this Agreement or (b) Company providing a Purchase Order or other Statement of Work to Contractor and Contractor accepting such Purchase Order or other Statement of Work (including by commencing performance pursuant to such Purchase Order or other Statement of Work). In addition, in no event shall the terms and conditions of any proposal, Purchase Order or other Statement of Work, acknowledgement, invoice, or other document unilaterally issued by Contractor be binding upon Company without Company's explicit written acceptance thereof. Any Work performed by Contractor without Company's binding commitment for such Work either via a duly executed or accepted Purchase Order or other Statement of Work under this Agreement shall be at Contractor's sole risk and expense, and Company shall have no obligation to pay for any such Work.

ARTICLE 3 CONDITIONS AND RISKS OF WORK; LABOR HARMONY

Unless the applicable Statement of Work expressly provides otherwise, Contractor agrees that before beginning any Work Contractor shall carefully examine all conditions relevant to such Work and its surroundings, and, unless Contractor notifies Company in writing that it will not perform the Work under such conditions, Contractor shall assume the risk of such conditions and shall, regardless of such conditions, the expense, or difficulty of performing the Work, fully complete the Work for the stated Contract Price applicable to such Work without further recourse to Company. Without limiting the foregoing, Contractor specifically recognizes that Company and other parties may be working concurrently at the site. Information on the site of the Work and local conditions at such site furnished by Company in specifications, drawings, or otherwise is made without representation or warranty of any nature by Company, is not guaranteed by Company, and is furnished solely for the convenience of Contractor. All drawings and other documents, if any, required to be submitted to Company for review shall be submitted in accordance with the mutually agreed to schedule, and, if no schedule applies, such drawings or other documents shall be submitted by Contractor without unreasonable delay. No Work affected by such drawings and other documents shall be started until Contractor is authorized to do so by Company. Contractor agrees that all labor employed by Contractor, its agents, or subcontractors for Work on the premises of Company shall be in harmony with all other labor being used by Company or other contractors working on Company's premises. Contractor agrees to give Company immediate notice of any threatened or actual labor dispute and will provide assistance as determined necessary by Company to resolve any such dispute. Contractor, its agents, or subcontractors shall remove from Company's premises any person objected to by Company in association with the Work.

ARTICLE 4 COMPANY CHANGES IN WORK

The scope of and conditions applicable to the Work shall be subject to changes by Company from time to time. Such changes shall only be enforceable if documented in a writing executed by Company and as accepted by Contractor. Except as otherwise specifically set forth in this Agreement, changes in the scope of or conditions applicable to the Work may result in adjustments in the Contract Price and/or the Work schedule in accordance with this Article 4. If Contractor believes that adjustment of the Contract Price or the Work schedule is justified, whether as a result of a change made pursuant to this Article or as a result of any other circumstance, then Contractor shall (a) give Company written notice of its claim within five (5) business days after receipt of notice of such change or the occurrence of such circumstances and (b) shall supply a written statement supporting Contractor's claim within ten (10) business days after receipt of notice of such change or occurrence of such circumstances, which statement shall include Contractor's detailed estimate of the effect on the Contract Price and/or the Work schedule. Contractor agrees to continue performance of the Work during the time any claim hereunder is pending. Company shall not be bound to any adjustments in the Contract Price or the Work schedule unless expressly agreed to by Company in writing. Company will not be liable for, and Contractor waives, any claims of Contractor that

Contractor knew or should have known and that were not reported by Contractor in accordance with the provisions of this Article.

ARTICLE 5 FORCE MAJEURE

Neither party shall be liable to the other for any damages for any failure to perform or for any delays or interruptions beyond that party's reasonable control in performing any of its obligations under this Agreement due to acts of God, fires, floods, earthquakes, riots, war, acts of terrorism, civil insurrection, acts of the public enemy, or acts or failures to act of civil or military authority, unless the time to perform is expressly guaranteed. Contractor shall advise Company immediately of any anticipated and actual failure, delay, or interruption and the cause and estimated duration of such event. Any such failure, delay, or interruption, even though existing on the date of this Agreement or on the date of the start of the Work, shall require Contractor to within five (5) days submit a recovery plan detailing the manner in which the failure, delay, or interruption shall be remedied and the revised schedule. Contractor shall diligently proceed with the Work notwithstanding the occurrence thereof. This Article shall apply only to the part of the Work directly affected by the particular failure, delay, or interruption, and shall not apply to the Work as a whole or any other unaffected part thereof.

ARTICLE 6 CONTRACTOR DELAYS

Time is an important and material consideration in the performance of this Agreement by Contractor. Contractor agrees to cooperate with Company in scheduling the Work so that the project and other activities at Company's site will progress with a minimum of delays. Company shall not be responsible for compensating Contractor for any costs of overtime or other premium time work unless Company has provided separate prior written authorization for additional compensation to Contractor, and, if Company provides such written authorization, such additional compensation shall be limited to Contractor's actual cost of the premium portion of wages, craft fringe benefits, and payroll burdens. Contractor shall be liable for all failures, delays, and interruptions in performing any of its obligations under this Agreement which are not (a) caused by Company and reported in accordance with Article 4, (b) excused by Article 5, or (c) directed by Company pursuant to Article 7. Contractor shall, without adjustment to completion date or Contract Price, be obligated to make up time lost by such failures, delays, or interruptions. Company may suspend payments under this Agreement during the period of any such failure, delay, or interruption.

ARTICLE 7 COMPANY EXTENSIONS

Company shall have the right to extend schedules or suspend the Work, in whole or in part, at any time upon written notice to Contractor (except that in an emergency or in the event that Company identifies any safety concerns, Company may require an immediate suspension upon oral or written notice to Contractor). Contractor shall, upon receipt of such notice, immediately suspend or delay the Work. Contractor shall resume any suspended Work when directed by Company. If Contractor follows the requirements of Article 4, a mutually agreed equitable adjustment to the Contract Price or to the schedules for payments and performance of the remaining Work may be made to reflect Company's extension of schedules or suspension of the Work. Contractor shall provide Company all information Company shall request in connection with determining the amount of such equitable adjustment.

ARTICLE 8 INSPECTING, TESTING, AUDITING, AND USE OF TOOLS AND EQUIPMENT;

8.01 Right of Inspecting and Testing: Company reserves the right, but shall not be obligated, to appoint representatives to follow the progress of the Work with authority to suspend any Work not in compliance with this Agreement. The appointment or absence of an appointment, of such representatives by Company shall not have any effect on warranties. Acceptance or approval by Company's representative shall not be deemed to constitute final acceptance by Company, nor shall Company's inspection relieve Contractor of responsibility for proper performance of the Work. Inspection by Company's representative shall not be deemed to be supervision or direction by Company of Contractor, its agents, servants, or employees, but shall be only for the purpose of attempting to ensure that the Work complies with this Agreement. In the event Contractor fails to provide Company with reasonable facilities and access for inspection when

advised, and if in the opinion of Company it becomes necessary to dismantle the Work for such inspection, then Contractor shall bear the expenses of such dismantling and reassembly.

8.02 Right of Auditing: Contractor shall maintain complete records relating to any cost-based (i.e., Work not covered by firm prices) components of the Work billed under this Agreement or relating to the quantity of units billed under any unit price provisions of this Agreement (all the foregoing hereinafter referred to as "Records") for a minimum of five years following the latest of performance of, delivery to Company of, or payment by Company for, such Work or units. All such Records shall be open to inspection and subject to audit and reproduction during normal working hours, by Company or its authorized representatives to the extent necessary to adequately permit evaluation and verification of any invoices, payments, time sheets, or claims based on Contractor's actual costs incurred in the performance or delivery of Work under this Agreement. For the purpose of evaluating or verifying such actual or claimed costs, Company or its authorized representative shall have access to said Records at any time, including any time after final payment by Company to Contractor pursuant to this Agreement. All non-public information obtained in the course of such audits shall be held in confidence except pursuant to judicial and administrative order. Company or its authorized representative shall have access, during normal working hours, to all necessary Contractor facilities and shall be provided adequate and appropriate work space to conduct audits in compliance with the provisions of this Article. Company shall give Contractor reasonable notice of intended audits. The rights of Company set forth in this paragraph shall survive the termination or expiration of this Agreement.

8.03 Use of Tools and Equipment: Company, in its sole discretion, may allow Contractor to use Company's Tools and Equipment for the Work and related activities at designated Company locations. Contractor shall indemnify and hold harmless Company and its Affiliates, including their respective officers, directors, shareholders, agents, members and employees (each an "Indemnified Party"), from and against any and all claims, damages, losses or liabilities arising out of, relating to, or in connection with, the use of Company's Tools and Equipment by Contractor, its agents, servants, employees or subcontractors, and will reimburse each Indemnified Party for all expenses (including attorney's fees and expenses) as they are incurred in connection with investigating, preparing or pursuing or defending any action, claim, suit or investigation or proceeding related to, arising out of, or in connection with, the use of Company's Tools and Equipment by Contractor, its agents, servants, employees or subcontractors, whether or not threatened or pending and whether or not any Indemnified Party is a party. Contractor, on behalf of itself or its agents, affiliates, officers and directors, and all of their predecessors, successors, assigns, heirs, executors and administrators, hereby irrevocably release, discharge, waive, relinquish and covenant not to sue, directly, derivatively or otherwise, Company and/or its Affiliates and each of their respective directors, officers, shareholders, members, partners (general or limited), employees and agents (including, without limitation, its financial advisors, counsel, proxy solicitors, information agents, depositories, consultants and public relations representatives) and all of their predecessors, successors, assigns, heirs, executors or administrators, and all persons acting in concert with any such person , with respect to any and all matters, actions causes of action (whether actually asserted or not), suits, damages, claims, or liabilities whatsoever, at law, equity or otherwise, arising out of, relating to, or in connection with the use of Company's Tools and Equipment by Contractor, its agents, servants, employees or subcontractors. Company shall in no event be liable for any claim whatsoever by or through Contractor, its employees, agents and/or subcontractors or by any third party, for any inoperability or failure of the Tools and Equipment to perform as designed or intended, whether such claim is based in warranty, contract, tort (including negligence), strict liability or otherwise and whether for direct, incidental, consequential, special, exemplary or other damages. Contractor shall ensure that its employees, agents, subcontractors or servants shall inspect, exercise the appropriate level of care in the use, maintenance and repair of the Tools and Equipment, so as to minimize the incidence of casualties and injuries occurring in connection therewith.

ARTICLE 9 COMPLIANCE WITH APPLICABLE LAWS; SAFETY; DRUG AND ALCOHOL TESTING

9.01 Applicable Laws and Safety: Contractor agrees to protect its own and its subcontractors' employees and be responsible for their Work until Company's acceptance of the entire project and to protect Company's facilities, property, employees, and third parties from damage or injury. Contractor shall at all times be solely responsible for complying with all Applicable Laws and facility rules, including without limitation those relating to health and safety, in connection with the Work and for obtaining (but only as approved by Company) all permits and approvals necessary to perform the Work. Without limiting the foregoing, Contractor agrees to strictly abide by and observe all standards of the Occupational Safety & Health Administration (OSHA) which are applicable to the Work being performed now or in the future, as well as Company's Contractor Code of Business Conduct and Company's Contractor/Subcontractor Safety Policy which are both hereby incorporated by reference (Contractor hereby acknowledges receipt of a copy of such Company's Contractor Code of Business Conduct and Company's Contractor/Subcontractor Safety Policy) and any other rules and regulations of the Company, all of which are incorporated herein by reference. Contractor also agrees to be bound to any amendments and/or modifications that may be issued in the future by Company from time to time, with respect to Company's Contractor Code of Business Conduct and/or any of its related policies which are the subject of this Article 9. Contractor shall maintain the Work site in a safe and orderly condition at all times. Company shall have the right but not the obligation to review Contractor's compliance with safety and cleanup measures. In the event Contractor fails to keep the work area clean, Company shall have the right to perform such cleanup on behalf of, at the risk of and at the expense of Contractor. In the event Contractor subcontracts any of the Work, Contractor shall notify Company in writing of the identity of the subcontractor before utilizing the subcontractor. Contractor shall require all of its subcontractors to complete the safety and health questionnaire and checklists provided by Company and shall provide a copy of such documents to Company upon request. Contractor shall conduct, and require its subcontractors to conduct, safety audits and job briefings during performance of the Work. In the event a subcontractor has no procedure for conducting safety audits and job briefings, Contractor shall include the subcontractor in its safety audits and job briefings. All safety audits shall be documented in writing by the Contractor and its subcontractors. Contractor shall provide documentation of any and all audits identifying safety deficiencies and concerns and corrective action taken as a result of such audits to Company semi-monthly.

9.02 Hazards and Training: Contractor shall furnish adequate numbers of trained, qualified, and experienced personnel and appropriate safety and other equipment in first-class condition, suitable for performance of the Work. Such personnel shall be skilled and properly trained to perform the Work and recognize all hazards associated with the Work. Without limiting the foregoing, Contractor shall participate in any safety orientation or other of Company's familiarization initiatives related to safety and shall strictly comply with any monitoring initiatives as determined by Company. Contractor shall accept all equipment, structures, and property of Company as found and acknowledges it has inspected the property, has determined the hazards incident to working thereon or thereabouts, and has adopted suitable precautions and methods for the protection and safety of its employees and the property.

9.03 Drug and Alcohol: No person will perform any of the Work while under the influence of drugs or alcohol. No alcohol may be consumed within four (4) hours of the start of any person's performance of the Work or anytime during the workday. A person will be deemed under the influence of alcohol if a level of .02 percent blood alcohol or greater is found. In addition to the requirements of the drug testing program, as set forth in Company's rules and regulations, all persons who will perform any of the Work will be subject to drug and alcohol testing under either of the following circumstances: (i) where the person's performance either contributed to an accident or cannot be completely discounted as a contributing factor to an accident which involves off-site medical treatment of any person; and (ii) where Company determines in its sole discretion that there is reasonable cause to believe such person is using drugs or alcohol or may otherwise be unfit for duty. Such persons will not be permitted to perform any Work until the test results are established. Contractor shall be solely responsible for administering and conducting drug and alcohol testing, as set forth herein, at Contractor's sole expense. As applicable and in addition to any other requirements under this Agreement, Contractor shall develop and strictly comply with any and all drug testing requirements as required by Applicable Laws.

9.04 Office of Compliance: The Company has an Office of Compliance. Should Contractor have actual knowledge of violations of any of the herein stated policies of conduct in this Article 9, or have a

reasonable basis to believe that such violations will occur in the future, whether by its own employees, agents, representatives or subcontractors, or by another vendor and/or supplier of the Company and its employees, agents, representatives or subcontractors, or by any employee, agent and/or representative of Company, Contractor has an affirmative obligation to immediately report any such known, perceived and/or anticipated violations to the Company's Office.

ARTICLE 10 STATUS OF CONTRACTOR

Company does not reserve any right to control the methods or manner of performance of the Work by Contractor. Contractor, in performing the Work, shall not act as an agent or employee of Company, but shall be and act as an independent contractor and shall be free to perform the Work by such methods and in such manner as Contractor may choose, doing everything necessary to perform such Work properly and safely and having supervision over and responsibility for the safety and actions of its employees and the suitability of its equipment. Contractor's employees and subcontractors shall not be deemed to be employees of Company. Contractor agrees that if any portion of Contractor's Work is subcontracted, all such subcontractors shall be bound by and observe the conditions of this Agreement to the same extent as required of Contractor. In such event, Company strongly encourages the use of Minority Business Enterprises, Women Business Enterprises, and Disadvantaged Business Enterprises, as defined under federal law and as certified by a certifying agency that Company recognizes as proper.

ARTICLE 11 EQUAL EMPLOYMENT OPPORTUNITY

To the extent applicable, Contractor shall comply with all of the following provisions, which are incorporated herein by reference: (i) Equal Opportunity regulations set forth in 41 CFR § 60-1.4(a) and (c), prohibiting employment discrimination against any employee or applicant because of race, color, religion, sex, or national origin; (ii) Vietnam Era Veterans Readjustment Assistance Act regulations set forth in 41 CFR § 60-250.4 relating to the employment and advancement of disabled veterans and Vietnam era veterans; (iii) Rehabilitation Act regulations set forth in 41 CFR § 60-741.4 relating to the employment and advancement of qualified disabled employees and applicants for employment; (iv) the clause known as "Utilization of Small Business Concerns and Small Business Concerns Owned and Controlled by Socially and Economically Disadvantaged Individuals" set forth in 15 USC § 637(d)(3); and (v) the subcontracting plan requirement set forth in 15 USC § 637(d).

ARTICLE 12 INDEMNITY BY CONTRACTOR

12.01 Indemnity: Contractor shall be responsible for and shall indemnify, and save harmless Big Rivers Electric Corporation from any and all damage, loss, suit, liability, fine, penalty, or forfeiture including, but not limited to, costs and expenses, and payment of any settlement or judgment therefore, but only to the extent actually caused by the negligence of Contractor:

(1) injuries or deaths to persons,
(2) damages to or destruction of real, personal, or intangible properties,
(3) violations of any other rights asserted against Big Rivers Electric Corporation, including patents, trademarks, trade names, copyrights, contract rights, and easements, or
(4) violations of governmental laws, regulations or orders whether suffered directly by Big Rivers Electric Corporation itself, or indirectly by reason of suits against it, but only to the extent directly resulting from negligent acts or omissions of Contractor, its employees, agents, business invitees, or other representatives or from their presence on the premises of Big Rivers Electric Corporation, either solely or in occurrence with any alleged joint negligence of Big Rivers Electric Corporation.

Big Rivers Electric Corporation shall be liable for its sole negligence and to the extent of its concurrent negligence. Indemnification of Big Rivers Electric Corporation includes its officers, employees, and agents.

ARTICLE 13 ENVIRONMENTAL

13.01 Control: As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200) and certain other Applicable Laws, Contractor or its subcontractors shall provide Material Safety Data Sheets

("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Agreement. Contractor and its subcontractors shall provide Company with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any Applicable Laws in effect at the worksite. **No asbestos or lead containing materials shall be incorporated into any Work performed by Contractor or otherwise left on the Work site without the prior written approval of Company.** Contractor and its subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Agreement is subject to any Applicable Laws.

13.02 Labeling: Contractor and its subcontractors shall label hazardous substances and materials and train their employees in the safe usage and handling of such substances and materials as required under any Applicable Laws.

13.03 Releases: Contractor and its subcontractors shall be solely responsible for the management of any petroleum or hazardous substances and materials brought onto the Work site and shall make reasonable efforts to prevent the release of petroleum or hazardous substances and materials into the environment. All petroleum or hazardous substances and materials shall be handled and stored according to Contractor's written Spill Prevention Control and Countermeasures Plan or Best Management Practices Plan as defined under the provisions of the Clean Water Act, as amended, if either such Plan must be maintained pursuant to Applicable Laws. Contractor shall provide secondary containment for the storage of petroleum or hazardous substances and materials. The prompt and proper clean-up of any spills, leaks, or other releases of petroleum or hazardous substances and materials resulting from the performance of the Work under this Agreement and the proper disposal of any residues shall be Contractor's sole responsibility, but Contractor shall give Company immediate notice of any such spills, leaks, or other releases. Contractor shall be solely responsible for the storage, removal, and disposal of any excess or unused quantities of chemicals and materials which Contractor causes to be brought to the Work site.

13.04 Generated Wastes: Unless Company and Contractor expressly agree otherwise in writing, Contractor and its subcontractors shall be solely responsible for any wastes generated in the course of the Work, and Contractor shall handle, store, and dispose of such wastes in accordance with any Applicable Laws.

13.05 Survival: The obligations set forth in this Article shall survive termination or expiration of this Agreement.

ARTICLE 14 INSURANCE

14.01 Contractor's Insurance Obligation: Contractor shall provide and maintain, and shall require any subcontractor to provide and maintain the following insurance (and, except with regard to Workers' Compensation, employees' liability and professional liability), naming Company as additional insured and waiving rights of subrogation against Company and Company's insurance carrier(s)), and shall submit evidence of such coverage to Company prior to the start of the Work. Seller's liability shall not be limited to its insurance coverage.

14.02 Insurance: Seller shall furnish certificates of insurance, in the name of the Big Rivers Electric Corporation, evidencing insurance coverage of the following types of minimum amounts:

a. Workman's compensation and employers liability insurance covering all employees who perform any of the obligations under the contract or Purchase Order, in the amounts required by law. If any employer or employee is not subject to the workers compensation laws of the governing state, then insurance shall be obtained voluntarily to provide coverage to the same extent as though the employer or employee were subject to such laws.

b. Commercial general liability insurance covering all operation under the contract or Purchase Order: bodily injury; property damage, $1,000,000 each accident. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable. Coverage should include contractual liability, broad form property damage liability, owner's and contractor's protective (independent

contractor's) liability, products and completed operations hazard, explosion, collapse, and underground property damage hazard.

c. Automobile liability insurance on all motor vehicles used in conjunction with the contract or Purchase Order, whether owned, nonowned, or hired; bodily injury - $1,000,000 each person and $1,000,000 each occurrence; property damage $1,000,000 each occurrence. A combined single limit of $1,000,000 for bodily injury and property damage liability is acceptable. The insurance may be in a policy or policies of insurance. A primary policy and an excess policy including the umbrella or catastrophe form is acceptable.

Certificates evidencing the insurance coverage's must be furnished before the commencement of work. If any work to be performed under this contract or Purchase Order is sublet, the contractor will be required to furnish proof of insurance from all subcontractors evidencing equal to or better coverage.

14.03 Quality of Insurance Coverage: The above policies to be provided by Contractor shall be written by insurance companies which are both licensed to do business in the state where the Work will be performed and either satisfactory to Company or having a Best Rating of not less than A-. These policies shall not be canceled except with thirty (30) days written notice to Company from Contractor and the insurance carrier. Evidence of coverage, notification of cancellation or other changes shall be mailed to: Attn: Manager, Supply Chain, Big Rivers Electric Corp., P.O. Box 24, Henderson, KY 42419.

14.04 Implication of Insurance: Company reserves the right to request and receive a summary of coverage of any of the above policies or relevant endorsements; however, Company shall not be obligated to review any of Contractor's certificates of insurance, insurance policies, or endorsements, or to advise Contractor of any deficiencies in such documents. Any receipt of such documents or their review by Company shall not relieve Contractor from or be deemed a waiver of Company's rights to insist on strict fulfillment of Contractor's obligations under this Agreement.

14.05 Other Notices: Contractor shall provide notice of any accidents or claims at the Work site to Company's Manager, Risk Management at Big Rivers Electric Corporation., P.O. Box 24, Henderson, KY 42419 and Company's site authorized representative.

14.06: Construction contractors shall be required to provide (or Company may provide) the Company's Protective Liability Insurance naming the Company as a Named Insured and the Contractor as an additional insured, or, to endorse Company and Contractor as additional insureds on construction contractor's liability insurance policies covering claims for personal injuries and property damage. Construction contractors shall be required to provide certificates evidencing such insurance to the Company and Contractor.

14.07: Company and Contractor waive all rights against each other and their officers, directors, agents, or employees for damage covered by property insurance during and after the completion of Contractor's services. If the services result in a Construction Phase, a provision similar to this shall be incorporated into all Construction Contracts entered into by Company, and all construction contractors shall be required to provide waivers of subrogation in favor of Company and Contractor for damage or liability covered by any construction contractor's policy of insurance.

ARTICLE 15 WARRANTIES

Contractor warrants that:

(a) Contractor will provide its services in a manner consistent with that level of care and skill ordinarily exercised by other members of Contractor's profession currently providing the same or similar services in the same locale.

(b) the Work is not and shall not be subject to any encumbrance, lien, security interest, patent, copyright or trademark claims, infringements, or other defects in title; and

(c) any labor or services performed pursuant to this Agreement shall be performed in a competent, diligent, and timely manner in accordance with professionally accepted standards.

Contractor shall respond in writing to any warranty claim by Company within five (5) business days of the delivery of notice of such claim to Contractor.

15.01: Professional Responsibility: If the Contractor fails to meet the foregoing standard, Contractor will perform at its own cost, and without reimbursement from Company, the professional engineering services necessary to correct errors and omissions which are caused by Contractor's failure to comply with above

standard, and which are reported to Contractor within one year from the completion of Contractor's services for the Project. The obligations and representations contained in this Article are Contractor's sole obligation and Company's exclusive remedy with respect to the quality of services. Company's failure to properly operate and maintain the Facility or allow Contractor to perform such remedial services as Contractor may deem appropriate shall relieve Contractor of its obligation relative to such improper operation or maintenance.

ARTICLE 16 OWNERSHIP OF INTELLECTUAL PROPERTY; PATENTS

16.01 Ownership: All inventions, discoveries, processes, methods, designs, drawings, blueprints, information, software, works of authorship and know-how, or the like, whether or not patentable or copyrightable (collectively, "Intellectual Property"), which Contractor conceives, develops, or begins to develop, either alone or in conjunction with Company or others, in connection with the Work, shall be "work made for hire" and the sole and exclusive property of Company. Upon request, Contractor shall promptly execute all applications, assignments, and other documents that Company shall deem necessary to apply for and obtain letters patent of the United States and/or copyright registration for the Intellectual Property and in order to evidence Company's sole ownership thereof. Company agrees to utilize said Property, Work and Documents for this project only and only for their intended purpose. Any unauthorized, unintended or inappropriate use, reuse or modification, without the express written authorization of Contractor, will be at Company's sole and exclusive risk with no legal liability or exposure of any type to Contractor.

16.02 Royalties and License Fees: Contractor shall pay all royalties and license fees which may be payable on account of the Work or any part thereof. In case any part of the Work is held in any suit to constitute infringement and its use is enjoined, Contractor within a reasonable time shall, at the election of Company and in addition to Contractor's obligations under Article 12, either (a) secure for Company the perpetual right to continue the use of such part of the Work by procuring for Company a royalty-free license or such other permission as will enable Contractor to secure the suspension of any injunction, or (b) replace at Contractor's own expense such part of the Work with a non-infringing part or modify it so that it becomes non-infringing (in either case with changes in functionality that are acceptable to Company).

ARTICLE 17 RELEASE OF LIENS

Contractor hereby releases for itself and its successors in interest, and for all subcontractors and their successors in interest, any and all claim or right of mechanics or any other type lien upon Company's or any other party's property, the Work, or any part thereof as a result of performing the Work. As long as Company is not unreasonably or without due cause, withholding payment from Contractor, Contractor shall execute and deliver to Company such documents as may be required by Applicable Laws to make this release effective and shall give all required notices to subcontractors with respect to ensuring the effectiveness of the foregoing release against those parties. Contractor shall secure the removal of any lien that Contractor has agreed to release in this Article within five (5) working days of receipt of written notice from Company to remove such lien. If not timely removed, Company may remove the lien and charge all costs and expenses to Contractor, including without limitation costs of bonding off such lien.

ARTICLE 18 ASSIGNMENT OF AGREEMENT; SUBCONTRACTING

Upon prior written notice given to Company, Contractor shall not, by operation of law or otherwise, assign and/or subcontract any part of the Work or this Agreement without Company's prior written approval. Such approval, if given by Company, shall not relieve Contractor from full responsibility for the fulfillment of any and all obligations under this Agreement. Under any and all circumstances, any permitted assignee of Contractor, whether or not such assignee shall be a division, subsidiary and/or affiliate entity of Contractor, shall also be fully bound by the terms of this Agreement and, furthermore, upon request by Company, each of Contractor and its permitted assignee shall provide sufficient financial information, as determined by Company in its sole discretion, necessary to validate such assignee's credit worthiness and ability to perform under this Agreement.

ARTICLE 19 INVOICES AND EFFECT OF PAYMENTS

19.01 Invoices: Within a reasonable period of time following the end of each calendar month or other agreed period, Contractor shall submit an invoice to Company that complies with this Article. Payments shall be made within thirty (30) days of Company's receipt of Contractor's proper invoice, and, in the event that Company's payment is overdue, Contractor shall promptly provide Company with a notice that such payment is overdue. Contractor's invoices shall designate the Company location which is the responsible party. Such invoices shall reference the contract / Purchase Order number and shall also show labor, material, taxes paid (including without limitation sales and use taxes, duties, fees, and other assessments imposed by governmental authorities), freight, and all other charges (including without limitation equipment rental) as separate items. All invoices shall be submitted with supporting documentation and in acceptable form and quality to Company's authorized representative. Should Company dispute any invoice for any reason, payment on such invoice shall be made within thirty (30) days of the dispute resolution. Payment of the invoice shall not release Contractor from any of its obligations hereunder, including but not limited to its warranty and indemnity obligations. Invoices shall not be delivered with goods, unless expressly authorized by the Company, but all correspondence and packages related to this Agreement shall reference the Purchase Order / contract number assigned by Company.

19.02 Surcharges: All charges must be pre-approved and referenced within the purchase order or contract. Unapproved charges will not be accepted and will cause the invoice to be rejected and returned. This includes, but is not limited to, surcharges, packing charges, core charges, deposits, and/or any other added costs.

19.03 Taxes (Projects): If Company provides Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, then Contractor shall not withhold or pay Kentucky sales or use taxes to the extent such exemption certificate applies to the Work (such exemption does not and shall not apply to any materials consumed by Contractor in performing the Work). **Contractor agrees that it shall not rely upon Company's direct pay authorization in not withholding or paying Kentucky sales or use taxes.** If Company does not provide Contractor with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, Contractor shall be solely responsible for paying all appropriate sales, use, and other taxes and duties (including without limitation sales or use tax with respect to materials purchased and consumed in connection with the Work) to, as well as filing appropriate returns with, the appropriate authorities. To the extent specifically included in the Contract Price, Contractor shall bill Company for and Company shall pay Contractor all such taxes and duties, but Company shall in no event be obligated for taxes and duties not specifically included in the Contract Price or for interest or penalties arising out of Contractor's failure to comply with its obligations under this Section.

Taxes (Goods): Do not bill Kentucky Sales Tax: Blanket Direct Pay Authorization maintained under 103 KAR 31:030, Permit # 108814.

19.04 Billing of Additional Work: All claims for payments of additions to the Purchase Order / Contract Price shall be shown on separate Contractor's invoices and must refer to the specific change order or written authorization issued by Company as a condition to being considered for payment.

19.05 Effect of Payments/Offset: No payments shall be considered as evidence of the performance of or acceptance of the Work, either in whole or in part, and all payments are subject to deduction for loss, damage, costs, or expenses for which Contractor may be liable under any Purchase Order or set-off hereunder. Company, without waiver or limitation of any rights or remedies of Company, shall be entitled from time to time to deduct from any and all amounts owing by Company to Contractor in connection with this Agreement or any other contract with Company any and all amounts owed by Contractor to Company in connection with this Agreement or any other contract with Company.

19.06 Evidence of Payment to Subcontractors: Contractor shall, if requested by Company, furnish Company with a certificate showing names of Contractor's suppliers and subcontractors hereunder, and certifying to Company that said suppliers and subcontractors have been paid in full.

19.07 Task Authorization Compensation:

a. Lump Sum Contracts: Monthly statements will be submitted by Contractor to Company. Statements will be based on Consultant's estimated percent of services completed at the end of the preceding month. For additional, reduced, or changed scope of services, amount of payment for personnel time shall be adjusted on a mutually agreeable lump-sum basis or in

accordance with the attached Contractor's "Schedule of Hourly Professional Service Billing Rates."

b. Time and Material Contract Hourly Rate Structure: For services performed, the Company shall pay the Contractor in accordance with the attached Contractor's "Schedule of Hourly Professional Service Billing Rates." The schedule is effective to January 1, 2011, and will be revised annually.

ARTICLE 20 ROUTING OF SHIPMENTS

Company shall have the option of specifying the routing of shipments. If freight is included in the Contract Price, and such specified routing increases Contractor's shipping costs, Contractor shall immediately so notify Company, and should Company still specify the more expensive routing, then Company shall reimburse Contractor for the increase actually incurred thereby.

ARTICLE 21 TERM AND TERMINATION

21.01 Term: This Agreement shall commence on the date set forth above and shall survive in full force and effect until terminated as set forth below. A termination under this Article 21 based on certain Work shall only apply to the Statement of Work that covers such Work. Any Statements of Work that do not relate to such Work shall not be affected by such a termination.

21.02 Termination for Contractor's Breach: If the Work to be done under this Agreement shall be abandoned by Contractor, if this Agreement or any portion thereof shall be assigned by operation of law or otherwise, if the Work or any portion thereof is sublet by Contractor without the permission of Company, if Contractor is placed in bankruptcy, or if a receiver be appointed for its properties, if Contractor shall make an assignment for the benefit of creditors, if at any time the necessary progress of Work is not being maintained, or if Contractor is violating any of the conditions or agreements of this Agreement, or has executed this Agreement in bad faith, Company may, without prejudice to any other rights or remedies it may have as a result thereof, notify Contractor to discontinue any or all of the Work and terminate this Agreement in whole or part. In the event that Section 365(a) of the Bankruptcy Code or some successor law gives Contractor as debtor-in-possession the right to either accept or reject this Agreement, then Contractor agrees to file an appropriate motion with the Bankruptcy Court to either accept or reject this Agreement within twenty (20) days of the entry of the Order for Relief in the bankruptcy proceeding. Contractor and Company acknowledge and agree that said twenty (20) day period is reasonable under the circumstances. Contractor and Company also agree that if Company has not received notice that Contractor has filed a motion with the Bankruptcy Court to accept or reject this Agreement within said twenty (20) day period, then Company may file a motion with the Bankruptcy Court asking that this Agreement be accepted or rejected, and Contractor shall not oppose such motion.

21.03 Effect of Termination for Contractor's Breach: From the effective date of such termination notice, Contractor shall vacate the site, whereupon Company shall have the right but not the obligation to take possession of the Work wherever located, and Contractor shall cooperate with Company and cause Contractor's subcontractors to cooperate with Company so that Company can effect such possession. In obtaining replacement services, Company shall not be required to request multiple bids or obtain the lowest figures for completing the Work and may make such expenditures as shall best accomplish such completion and are reasonable given the circumstances. The expenses of completing the Work in excess of the unpaid portion of the Contract Price, together with any damages suffered by Company, shall be paid by Contractor, and Company shall have the right to set off such amounts from amounts due to Contractor.

21.04 Termination for Company's Convenience: Company may terminate this Agreement or one or more Statements of Work in whole or in part for its own convenience by thirty (30) days' written notice at any time. In such event, Company shall pay Contractor all direct labor and material costs incurred on the Work that is subject to such Termination prior to such notice, plus any reasonable unavoidable cancellation costs which Contractor may incur as a result of such termination, plus indirect costs or overhead on the portion of the Work completed, computed in accordance with generally accepted accounting principles less salvage value. As an alternative to salvage value reduction, Company shall have the right in its sole discretion to take possession of all or part of the Work.

ARTICLE 22 PUBLICITY

Contractor shall not issue news releases, publicize or issue advertising pertaining to the Work or this Agreement without first obtaining the written approval of Company.

ARTICLE 23 CONFIDENTIAL INFORMATION

All information relating to the Work or the business of Company, including, but not limited to, drawings and specifications relating to the Work, and customer information, shall be held in confidence by Contractor and shall not be used by Contractor for any purpose other than for the performance of the Work or as authorized in writing by Company except to the extent required by court order, subpoena, governmental directive or other valid legal process. In the event that the Contractor assigns the work to one or more subcontractors, a signed confidentiality agreement between the Contractor and each subcontractor(s) will be provided to the Company prior to the provision of any information described in the immediately preceding sentence or the performance of any Work by the subcontractor. All drawings, specifications, or documents furnished by Company to Contractor or developed in connection with the Work shall either be destroyed or returned to Company (including any copies thereof) upon request at any time except that one copy must be retained by Contractor as part of Contractor's records retention policy.

ARTICLE 24 MISCELLANEOUS

24.01 Waiver: No waiver by Company of any provision herein or of a breach of any provision shall constitute a waiver of any other breach or of any other provision.

24.02 Headings: The headings of Articles, Sections, paragraphs, and other parts of this Agreement are for convenience only and do not define, limit, or construe the contents thereof.

24.03 Severability: If any provision of this Agreement shall be held invalid under law, such invalidity shall not affect any other provision or provisions hereof which are otherwise valid.

24.04 State Law Governing Agreement: This Agreement shall be governed by, and construed in accordance with, the laws of the Commonwealth of Kentucky, without regard to its principles of conflicts of laws.

24.05 Enforcement of Rights:

If a dispute arises, the prevailing party shall have the right to recover from the other party all expenses, including, but not limited to fees for and expenses of inside or outside counsel arising out of said dispute, breach or any other action necessary to enforce or defend its rights hereunder.

24.06 No Third Party Beneficiaries: Except for Contractor and Company, there are no intended third party beneficiaries of this Agreement and none may rely on this Agreement in making a claim against Company.

24.07 Notices: All notices and communications respecting this Agreement shall be in writing, shall be identified by the contract number, and shall be addressed as follows (which address either party may change upon five (5) days prior notice to the other party).

24.08 Construction Phase: As Company's consultant, Contractor shall not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions or programs, or for Contractor's failure to perform construction work in accordance with the Contract Documents.

24.09 Computer Models: Contractor may use or modify Contractor's proprietary computer models in service of Company under this Agreement, or Contractor may develop computer models during Contractor's service to Company under this Agreement. Such use, modification, or development by Contractor does not constitute a license to Company to use or modify Contractor's computer models. Said proprietary computer models shall remain the sole property of the Contractor. Company and Contractor will enter into a separate license agreement if Company wishes to use Contractor's computer models.

24.10 Electronic Media: Any electronic media (computer disks, tapes, and similar items) furnished with respect to Contractor's services are for Company's information and convenience only. Such media are not to be considered part of Contractor's instruments of service. (Due to the potential that information contained in electronic media can be modified by Company or others, Contractor, at its option, may remove all indicia of Contractor's ownership and involvement from each electronic display.)

Contractor shall not be liable for loss or damage directly or indirectly, arising out of use of electronic media including, but not limited to, any loss of business or incidental or consequential damage. Company shall

assume all risk and release, indemnify, and hold harmless Contractor, its officers, directors, employees, servants, agents, successors, and assigns, from and against each and every claim or cause of action that Company or others may have or which may arise in the future respecting use of the electronic media.

If there is a discrepancy between the electronic media files and the signed and sealed hard copies, the hard copies shall govern.

ARTICLE 25 MUTUAL WAIVER OF CONSEQUENTIAL DAMAGES

Both parties agree that neither shall be liable to the other, or anyone claiming on their behalf, for any special, indirect or consequential damages of any type, whether arising in tort (including negligence), contract, warranty (express or implied), strict liability, statutory liability or any other cause of action, including but not limited to loss of profit, loss of use, loss of business, reputation or financing.

ARTICLE 26 LIMITATION OF LIABILITY

To the fullest extent permitted by law, Contractor's total liability pursuant or related to this Agreement, whether for breach of contract or by reason of any tort (including negligence), statute, warranty, or otherwise shall not exceed the total contract price of the purchase order/contract giving rise to the claim. However, Company and Contractor agree that the exclusion and limitation set forth in this Article shall not apply to the recovery of damages by Company to the extent covered by insurance proceeds from policies of insurance that Contractor is required to maintain pursuant to Article 14.02 herein.

ARTICLE 27 COST OPINIONS AND PROJECTIONS: Cost opinions and projections prepared by relating to construction costs and schedules, operation and maintenance costs, equipment characteristics and performance, and operating results are based on experience, qualifications, and judgment as a design professional. Since has no control over weather, cost and availability of labor, material and equipment, labor productivity, construction Contractors' procedures and methods, unavoidable delays, construction Contractors' methods of determining prices, economic conditions, competitive bidding or market conditions, and other factors affecting such cost opinions or projections, does not guarantee that actual rates, costs, performance, schedules, and related items will not vary from cost opinions and projections prepared by .

ARTICLE 28 RESPONSIBILITIES OF COMPANY

Company shall, within a reasonable time, so as not to delay the services of Contractor:

28.01: Provide full information as to Company's requirements for the Project.

28.02: Assist Contractor by placing at Contractor's disposal all available information pertinent to the assignment including previous reports and any other data relative thereto.

28.03: Furnish Contractor services or data such as core borings, probings and subsurface explorations, hydrographic surveys, laboratory tests and inspections of samples, materials, and equipment; appropriate professional interpretations of all of the foregoing; property, boundary, easement, right-of-way, topographic, and utility surveys; zoning and deed restrictions; and other special data or consultations, all of which Contractor may rely upon in performing his services under this Agreement.

28.04: Guarantee access to and make all provisions for Contractor to enter upon public and private property as required for Contractor to perform his services under this Agreement.

28.05: Examine all studies, reports, sketches, cost opinions, Bid Documents, Drawings, proposals, and other documents presented by Contractor and render in writing decisions pertaining thereto.

28.06: Provide such professional legal, accounting, financial, and insurance counseling services as may be required for the Project.

28.07: Designate in writing a person to act as Company's representative with respect to the services to be performed under this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define Company's policies and decisions with respect to materials, equipment, elements and systems to be used in the Project, and other matters pertinent to the services covered by this Agreement.

28.08: Give prompt written notice to Contractor whenever Company observes or otherwise becomes aware of any defect in the Project.
28.09: Furnish approvals and permits from all governmental authorities having jurisdiction over the Project and such approvals and consents from others as may be necessary for completion of the Project.

To Company:
Big Rivers Electric Corp.
Attn: Robert Toerne
P.O. Box 24
Henderson, Kentucky 42419

To Contractor:
Burns & McDonnell
Attn: Scott Strawn
9400 Ward Parkway
Kansas City, MO 64114

IN WITNESS WHEREOF, the parties have entered into this Agreement on the date set forth in the introductory paragraph of this Agreement.

COMPANY:

Big Rivers Electric Corp.

Signature

Robert F Toerne

Robert F. Toerne

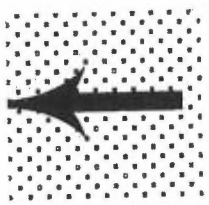
Director Supply Chain

Date

CONTRACTOR:

Burns & McDonnell Engineering Co.

Signature



Richard T. Halil, JR

Vice President

Date

7/6/10

Schedule of Hourly Professional Service Billing Rates

Position Classification	Classification Level	Hourly Billing Rate
General Office *	5	$56.00
Technician *	6	65.00
Assistant *	7	78.00
	8	106.00
	9	119.00
Staff *	10	130.00
	11	145.00
Senior	12	156.00
	13	168.00
Associate	14	179.00
	15	188.00
	16	193.00
	17	199.00

NOTES:

1. Position classifications listed above refer to the firm's internal classification system for employee compensation. For example, "Associate", "Senior", etc., refer to such positions as "Associate Engineer", "Senior Architect", etc.

2. For any nonexempt personnel in positions marked with an asterisk (*), overtime will be billed at 1.5 times the hourly labor billing rates shown.

3. Project time spent by corporate officers will be billed at the Level 17 rate plus 25 percent.

4. For outside expenses incurred by Burns & McDonnell, such as authorized travel and subsistence, and for services rendered by others such as subcontractors, the client shall pay the cost to Burns & McDonnell plus 10%.

5. A technology charge of $9.95 per labor hour will be billed for normal computer usage, computer aided drafting (CAD) long distance telephone, fax, photocopy and mail services. Specialty items (such as web and video conferencing) are not included in the technology charge.

6. Monthly invoices will be submitted for payment covering services and expenses during the preceding month. Invoices are due upon receipt. A late payment charge of 1.5% per month will be added to all amounts not paid within 30 days of the invoice date.

7. The services of contract/agency personnel shall be billed to Owner according to the rate sheet as if such contract/agency personnel is a direct employee of Burns & McDonnell.

8. The rates shown above are effective for services through December 31, 2013, and are subject to revision thereafter.

Burns & McDonnell
SINCE 1898

9400 Ward Parkway
Kansas City, MO 64114

www.burnsmcd.com

Atlanta
Chattanooga, Tenn.
Chicago
Dallas-Fort Worth
Denver
Houston
Kansas City, Mo.
Miami
Minneapolis-St. Paul
New England
New York
O'Fallon, Ill.
Omaha, Neb.
Phoenix
San Diego
San Francisco
St. Louis
Washington, D.C.
Wichita, Kan.

"Every service provided by Burns & McDonnell is backed by the integrity and commitment of all our employee owners. That's my promise to you."

Greg Graves, Chairman & CEO

Burns & McDonnell, making our clients successful for more than 100 years.

April 10, 2014

Mr. Rob Toerne
Director, Supply Chain
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Big Rivers Electric Corporation
MATS Compliance Project
Purchase Order: 218840
Change Order 01 - DCS Control / Reduction from Three Sites to One Site Proposal

Dear Mr. Toerne:

Burns & McDonnell is pleased to provide engineering services related to DCS control of the MATS equipment. In addition, this proposal will reduce the original scope of civil, structural, and mechanical design from the three plants (Wilson, Coleman, and Green) to Green station only.

Project

Big Rivers is performing upgrades to Green station to meet the upcoming MATS rule. The original design basis included PLC control for all of the MATS equipment as the OEM was to include, mount, prewire, and test their PLC prior to shipment. The change to eliminate the PLC control and go to a hard wired DCS design results in new balance of plant interconnecting wiring and control system modifications.

In addition, Coleman and Wilson have been removed from the project scope at this time. The change to eliminate these projects from the scope of work results in a deduction in the amount of civil, structural and mechanical balance of plant design original planned for Coleman and Wilson.

Services

The scope of work that is described below is based off of conversations and direction provided by Big Rivers and includes the following items:

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

DCS Control and Electrical Modifications
Green Only

- Create/manage cable schedule and cable routing through the plant to the electronics room.
- Prepare a DCS contract that incorporates the hardwired design and a conversion of the I/O points, tag database, logic, and graphics from the PLC language to the ABB control system.
- Incorporate a PCM building into the scope of work and participate in the FAT testing.
- Design cables, wiring diagrams, and raceway between the PCM and the silo's/equipment. The number of cables scheduled will increase by about a factor of 10 and will result in an increased number of schemes/wiring diagrams to be developed.

Coleman and Wilson Equipment Installation
The original design basis included modifications at Green, Coleman, and Wilson in order to add a DSI system and a PAC system for each Unit at these facilities. After Burns & McDonnell prepared and submitted the technical specifications for the DSI and PAC systems for Big Rivers review, Big Rivers requested that we remove the upgrades at Coleman and Wilson from the scope of services. This modification resulted in the following changes:

- Revise the technical specifications to only include Green.
- Remove the remaining mechanical balance of plant design for Coleman and Wilson.
- The structural, I&C, and electrical design for each of the plants were based on a common design between the plants. Therefore, this did not impact detailed engineering.
- Eliminate structural, mechanical, and civil detail drawings that were to be specific to the Coleman and Wilson sites.
- Remove the civil design required to incorporate Coleman and Wilson into the installation specifications.

Fee Proposal & Schedule

B&McD proposes to perform the engineering scope of work included herein for an estimated net increase including expenses of $70,000. This would increase the original Contract amount from $675,000 to $745,000. This net increase incorporates a reduction of ($89,000) for reducing the scope at Coleman and Wilson.

B&McD is prepared to commence work on this additional scope for Big Rivers upon acceptance of this Change Order. The DCS technical guidelines have already been made available to Big Rivers.

We appreciate the opportunity to serve Big Rivers on this effort. If you have any questions regarding this proposal, please contact me at 816-822-3544, Jeromy Jones at 816-822-3172 or Scott Strawn at 816-823-7153.

Sincerely,

Rick Halil

Rick Halil, P.E.
Senior Vice President, Energy Division

Jeromy Jones, P.E.
Project Manager

Big Rivers
ELECTRIC CORPORATION

Your Touchstone Energy® Cooperative

BLANKET PURCHASE ORDER

PURCHASE ORDER NO	REVISION	PAGE
218840	1	1

VENDOR: **BURNS AND MC DONNELL ENGINEERING CO INC**
9400 WARD PARKWAY
KANSAS CITY, MO 64114-3319

SHIP TO:
201 Third Street
Henderson,KY 42420

BILL TO:
201 Third Street
Henderson,KY 42420

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION

VENDOR NO	DELIVER TO	DATE OF ORDER/BUYER	REVISED DATE/BUYER
11363		22-MAY-13 Frederick, Dana Leigh	06-MAY-14 Frederick, Dana Leigh
PAYMENT TERMS 30 NET DAYS		BUYER TELEPHONE/FAX 270-844-6139 888-514-3178	F.O.B DESTINATION
FREIGHT TERMS ALLOWED/INCLUDED		SHIP VIA	VENDOR CONTACT/TELEPHONE (816) 333-9400

Special Instructions: This Purchase Order No. must appear on all invoices, packing lists, cartons and correspondences related to this order

QUESTIONS / REPLIES CONCERNING THIS DOCUMENT SHOULD BE DIRECTED TO:
DANA FREDERICK - HEADQUARTERS PHONE (270) 844-6139
FAX (888) 514-3178
EMAIL: DANA.FREDERICK@BIGRIVERS.COM

REV 1: NET INCREASE OF $70,000 TO PO INCLUDES DEDUCT FOR REDUCED SCOPE TO COLEMAN/WILSON AND INCREASE FOR DCS ENGINEERING.

A signed copy of the General Services Agreement (GSA) is on file at Big Rivers Electric Corporation and is hereby incorporated by reference.

ITEM	PART NUMBER/DESCRIPTION	DELIVERY DT	QTY	UNIT	UNIT PRICE	EXTENSION
1.0	ENGINEERING SERVICES FOR MATS COMPLIANCE PROJECT AS PER THE BURNS AND MCDONNELL PROPOSAL DATED 5/13/13, INCLUSIVE OF THE BIG RIVERS RFQ ISSUED ON 5/8/13 & 5/9/13 ISSUED VIA EMAIL			EACH	$ 1.00	$
2.0	ENGINEERING SERVICES FOR INCREASE FOR DCS ENGINEERING AND REDUCTION FOR LESSENED COLEMAN/WILSON SCOPE FOR A NET INCREASE OF $70,000			EACH	$ 1.00	$

TOTAL $ 745,000.00

Dana R Frederick