



City of Wentzville
Kimberly Butts, Director of Procurement
310 West Pearce Boulevard
Wentzville, Missouri 63385
(636) 639-2005

Invitation for Bids

IFB #16-062

Public Works Transfer Switch Installation

Date Bid Issued: October 27, 2016

TABLE OF CONTENTS

INVITATION FOR BIDS

Bid Notice	1
Information for Bidders	2
Scope of Services Overview	5
Pricing Form	Exhibit A
Subcontractor Form	Exhibit B
Non-Collusive Affidavit	Exhibit C

CONTRACT DOCUMENTS AND SPECIFICATIONS

City-Contractor Agreement and Terms & Conditions	CCA-1 to CCA-14
General Conditions	GC-1 to GC-33
Job Special Provisions	JSP-1
Public Works Transfer Switch Installation Specifications	
Public Works Transfer Switch One Line Diagram and Details	
Wage Rate Order #23	



City of Wentzville
Kimberly Butts, Director of Procurement
310 West Pearce Boulevard
Wentzville, Missouri 63385
(636) 639-2005

BID NOTICE
IFB #16-062

October 27, 2016

The City of Wentzville (the "City") is requesting sealed bids from qualified contractors for:
Public Works Transfer Switch Installation

The Public Works Transfer Switch Installation ("Project") shall consist of installing and testing of new Transfer Switch and related electrical equipment for the Public Works complex.

PRE-BID MEETING:

A non-mandatory Pre-Bid Meeting will be held at Public Works main office, 200 E. 4th Street, Wentzville, MO 63385 at 10 a.m. on November 8, 2016.

Sealed bids will be accepted by the City of Wentzville Procurement Department, City Hall, 310 W. Pearce Blvd, Wentzville, MO 63385 until 2 p.m. (local time) on November 22, 2016. Bids will be opened and read aloud.

Bid documents and plans are available on the City's Bid Opportunities website http://www.wentzvillemo.org/departments/procurement/current_bidding_opportunities.php. You will be required to create a free log-in with Vendor Registry in order to download the bid documents and plans.

All questions regarding this project shall be submitted to Alice Winkelman, Senior Procurement Specialist at Alice.Winkelman@Wentzvillemo.org and be in writing by November 14, 2016 end of business day.

The City reserves the right to reject any or all bids, or portions thereof, to waive technicalities or deficiencies in any or all the bids. The City of Wentzville reserves the right to cancel this IFB in part or in its entirety. This IFB does not commit the City of Wentzville to award a contract or to pay any costs to bidders in preparation of their bid.

The successful bidder shall be required to comply in all respects with the State Statutory provisions concerning the payment of prevailing wages on Public Works, Section 290.262 RSMo and shall pay to all workmen performing the work under the Contract not less than the prevailing hourly rate of wages as determined by the Department of Labor and Industrial Relations of the State of Missouri.

The City of Wentzville hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this solicitation, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

City of Wentzville
Kimberly Butts, CPPO, CPSM
Director of Procurement

INFORMATION FOR BIDDERS

1. **Background and Funding:** The Public Works Transfer Switch Installation will include installing and testing of new Transfer Switch and related electrical equipment for the Public Works complex.

This project is fully funded through City of Wentzville funding.

2. **Questions and Addendums:** All questions must be submitted in writing via email to Alice Winkelman, Senior Procurement Specialist at Alice.Winkelman@Wentzvillemo.org with the project name in the subject line before time and date indicated. No verbal interpretation will be recognized; any and all such interpretations shall be confirmed in an addendum to the bid by the City.

Addendums will be posted on the City's website at:

http://www.wentzvillemo.org/departments/procurement/current_bidding_opportunities.php.

Bidders are responsible for checking the City's website for the issuance of any addendums. The Bidding Opportunities website shall be the official site for information as related to this IFB.

To ensure fair consideration for all bidders, the City prohibits communication to or with any City department(s), board member(s), or employee(s) during the submission process, except as provided above. Additionally, the City prohibits communications initiated by a bidder to the City official(s) or employee(s) evaluating or considering the bids prior to the time an award decision is made. Any communication between Bidder and the City will be initiated by the appropriate City official(s) or employee(s) in order to obtain information or clarification needed to develop a proper, accurate evaluation of the bid. Such communications initiated by a bidder may be grounds for disqualifying the offending bidder from consideration for award of the bid and/or any future bid(s).

3. **Sealed Bids Required:** No type of electronic submittal (fax, email, etc.) of bids will be accepted. The sealed envelope shall be clearly marked with the IFB number and title, and Bidder Name on the outside of envelope.

4. **Bidder Documentation:** All responses, inquiries, or correspondence relating to, or in reference to, this Invitation for Bid, and all reports, charts, displays, schedules, exhibits and other documentation by the Bidder shall become the property of the City when received. All bids submitted shall also become the property of the City. If any proprietary information is contained in the bid, it should be clearly identified. Marking the entire bid as proprietary will be neither accepted nor honored. If a request is made to view a Bidder's bid submission, the City will comply according to Missouri Sunshine Law.

5. **Bid Opening:** Bids will be publicly opened and read aloud on the date and time and at the location indicated. The Bidder is solely responsible for insuring its bid is received at the time, date, and location specified. The bid opening is public and anyone may attend.

6. **Examination of Bid/Contract Documents and Site of Work:** The Bidder is expected to carefully examine the site of proposed work, the specifications, and the Bid/Contract documents before submitting a bid. The submission of a bid shall be considered prima facie evidence that the Bidder has made such examination and is satisfied to the conditions to be

encountered in performing the work and as to the requirements of the Bid/Contract documents. Differing site conditions from the bid documents may not be used for justification of a change order.

7. Product Substitutions: Requests for product substitutions will not be considered during bidding. If Contractor's bid includes substitutions it shall be at the Contractor's risk and responsibility to demonstrate that the substitution is a "functional equivalent" product during submittal reviews. During the review process, if substituted products are determined not to be functionally equivalent, Contractor shall provide products as specified at no additional cost to the City.

8. Laws to be Observed: The Contractor shall at all times observe and comply with all Federal and State laws, all local laws, ordinances, and regulations existing at the time of or enacted subsequent to the execution of the contract which, if in any manner, affect the execution of the work.

9. Taxes: This project is exempt from all sales taxes for construction materials and supplies used directly in fulfilling contract requirements. Sales tax shall not be included into the price(s) for this project. The contractor shall follow the regulations as outlined in Section 144.062 RSMo Construction Materials Exemption Allowed.

10. Prevailing Wage: The successful Bidder shall be required to comply in all respects with State Wage Rates, including applicable statutory provisions concerning payment of prevailing wages on public works projects, Sections 290.210 through 290.340 RSMo as currently amended, and shall pay to all workmen performing under work contract not less than prevailing hourly rate of wages as determined by the Department of Labor and Industrial Relations of the State of Missouri

As such, the bid for this project shall be based upon the required payment by the Contractor for wages for each craft or type of workmen required to execute the Contract. A schedule of such prevailing hourly rate of wages as determined by the Department of Labor and Industrial Relations of Missouri, pursuant to said statutory provisions is attached hereto and made a part of this Contract.

11. OSHA Required Training: Pursuant to Section 292.675 RSMo, Contractor shall require all on-site employees to complete the ten-hour training program as required under Section 292.675 RSMo. This program shall be provided by Contractor and shall be a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for Contractor's on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Missouri Department of Labor and Industrial Relations ("MoDOLIR") which is at least as stringent as an approved OSHA program. All employees are required to complete the program within sixty days of beginning work under this Agreement. Contractor shall further require all subcontractors under Contractor to provide the ten-hour training program required under Section 292.675 RSMo. to such subcontractors' on-site employees. On-site employees who have previously completed such ten-hour training program must hold documentation of prior completion of the program.

12. Equal Employment Opportunity: The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin,

or disability. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment; advertising; layoff or termination; rates of pay or other forms of compensation; and selection of training, including apprenticeship. The Contractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or disability. The Contractor shall incorporate the foregoing requirements of this paragraph in all of its subcontracts for work performed under the terms and conditions of this Contract. A breach of this provision may be grounds for termination of this Contract.

13. References: The City may request references from any bidder.

14. Method of Award: The solicitation shall be awarded to the lowest, responsive, responsible bidder. The City reserves the right, in its sole discretion, to reject any or all bids, or portions thereof, to waive technicalities or deficiencies in any or all the bids.

The responsiveness of the bidder shall be determined by the City based whether their bid fully conforms in all material respects to the solicitation and all of its requirements, including all form and substance.

The responsibility of the bidder shall be determined by the City based on, but not limited to, whether the bidder is capable of meeting all of the requirements of the solicitation and subsequent contract; possesses full capability, including financial and technical, to perform as contractually required; and the quality and performance of previous contracts or services.

15. Notice of Intent to Award: The successful bidder will receive a Notice of Intent to Award listing documentation that the bidder is required to submit, which includes but is not limited to the following:

- City-Contractor Agreement (*sample included with this solicitation*)
- Affidavit of Participation in Federal Work Authorization Form (*sample included with this solicitation*)
- E-Verify Memorandum of Understanding (*showing electronic signatures of Contractor and Homeland Security*)
- Insurance
- Bonds

16. Performance Bond: If the Contractor's Bid is in excess of \$50,000.00, the Contractor shall also furnish within ten (10) days of notification of contract award a satisfactory Performance Bond in the full amount of the Bid based on the bid quantities listed on the Pricing Form. The Performance Bond furnished shall guarantee the faithful performance of the Work and warrant the Work for the guaranty period established in this City-Contractor Agreement.

17. Payment Bond: If the Contractor's Bid is in excess of \$50,000, the Contractor shall furnish within ten (10) days of notification of contract award a satisfactory Payment Bond in the full amount of the Contract Sum. The Payment Bond furnished shall meet all requirements of Section 107.170 of the Revised Statutes of Missouri, as amended, and shall guarantee the payment of any and all materials, incorporated, consumed or used in connection with the construction of such work, and all insurance premiums, both for compensation, and for all other kinds of insurance, said work, and for all labor performed in such work whether by subcontractor or otherwise, including payment of prevailing wage requirements of the State of Missouri.

18. Bond Premiums: The premiums on all the bonds shall be paid by the Contractor.

19. Notice to Proceed: Upon submittal and acceptance of all items as outlined in the Notice of Award, the successful bidder will receive Notice to Proceed and will be required to attend a Pre-Construction Meeting prior to beginning work.

The City will issue the Contractor a tax exemption letter and a project exemption certificate. These documents are to be given to the contractor's suppliers and used only for the specific project identified and will expire on the date indicated unless renewed by the City.

20. SCOPE OF SERVICES OVERVIEW

This project will include installation of a fused NEMA 4X heavy duty service entrance double throw safety switch. The existing ground field will need to be re-installed at the proposed transfer switch. In order to simplify the installation and bring it up to code a distribution panel board will be added to feed the existing five disconnects. The proposed location of the transfer switch is next to the existing utility CT cabinet and meter. The addition of the proposed equipment will require the utility feed to be shut off. Requested power outages must be scheduled in advanced, and shall be avoided during regular work hours of the Public Works Facility and during any emergency operations. Regular work hours are from 6 am to 4 pm, Monday through Friday. Emergency operations include but is not limited to snow removal. Temporary power will need to be provided, unless written consent of the City is provided to authorize a power outage. Maximum duration of any single authorized power outage, whether partial or complete, shall be four (4) hours. The Contractor will need to verify the current load, peak demand to ensure adequate rating of all equipment for installation prior to purchase. The Contractor will also be required to provide a temporary generator to test the operation of the transfer switch once installed.



EXHIBIT A PRICING FORM

For: IFB #16-062– Public Works Transfer Switch Installation

To: Procurement Department
City of Wentzville
310 W. Pearce Blvd.
Wentzville, MO 63385

Pursuant to and in compliance with your Invitation for Bid, the Information for Bidders, Contract Document and Specifications and other documents relating thereto, the undersigned Bidder hereby proposes and agrees/guarantees that:

1. They have visited and examined the project site(s) and have carefully examined the Contract Documents and Specifications and any and all Addenda, as indicated below.
2. If this Invitation for Bid is accepted, to furnish all tools, equipment, labor, materials, supplies, and services to construct the project in strict conformance with the Contract Documents and Specifications, within the time set forth therein, for the price indicated in this Exhibit A Pricing Form). These prices are to cover all expenses incurred in performing the work required under the Agreement of Services, of which this Pricing Form is a part.
3. If awarded the Contract for the above work, they will have a maximum of ten (10) calendar days; excluding holidays from the date of the Notice of Intent to Award letter to submit supportive documentation as outlined in the notification letter. Failure to complete the outlined requirements within such timeframe shall be subject to forfeiture of the subject contract.
4. Time is of the essence. The Contractor will commence construction of the work promptly upon receipt of the Notice to Proceed, after the Pre-Construction Meeting, and will complete the project without delay in accordance with the Contract Documents and Specifications.
5. If the Bid is accepted, the Contractor will substantially complete (make available for use) the said work within **one-hundred twenty (120) calendar days** after receiving the Notice to Proceed, and that should they fail to complete the work in the time specified or such additional time as may be allowed by the Engineer under the Contract, the amount of liquidated damages to be recovered shall be per the City-Contractor Agreement.
6. The Bid is firm for 90 days from the bid opening date.
7. Bidder understands and will comply with all terms and conditions of these Bid Documents, the City-Contractor Agreement, and the Contract Documents and Specifications and any subsequent award or contract.
8. Bid bond required if total bid price exceeds \$50,000.00: The bid bond (5% of bid amount) submitted with this Bid is from a surety that is authorized to do business in the State of Missouri and is authorized to issue bonds in the State of Missouri.

Public Works Transfer Switch Installation – IFB #16-062
Exhibit A - Pricing Form (Continued)

Lump Sum Bid Price (numerical): \$ _____

Lump Sum Bid Price (written in words): _____

Indicate below all Addenda received on which your bid is based:

Addendum No. _____ Dated: _____
Addendum No. _____ Dated: _____
Addendum No. _____ Dated: _____

The Contractor understands and agrees that by signing the Invitation for Bid the Bidder is certifying that Contractor employs only personnel authorized to work in the United States in accordance with applicable federal and state laws. This certification applies to State of Missouri Immigration Alien Laws and statutes required local government(s) to have proof of a person's lawful presence within the United States before distributing "Public Benefits" (contracts, purchase orders, etc.) to that Bidder.

Legal Company Name: _____

Indicate whether () Individual; () Partnership; () Corporation, () LLC
Incorporated in the State of _____.

Authorized Signature: _____

Name (Printed): _____

Title: _____

Business Address: _____

City: _____

State: _____ Zip: _____

Telephone No: _____ Fax No: _____

State Charter #: _____

Email address: _____

ATTEST: _____
Title Dated

Attach Corporate Seal, if Applicable

Enclosures: Exhibit A –Pricing Form
Exhibit B – Subcontractor Form
Exhibit C - Non-Collusive Affidavit
Bid Security of 5% of Bid Amount if Bid Amount exceeds \$50,000

Bidder Name: _____

**EXHIBIT B
SUBCONTRACTOR FORM**

This form must accompany and be part of your sealed bid. **If you do not plan to use subcontractors, indicate below and return this form with your bid.**

The above referenced Bidder intends to subcontract for materials, services, supplies, specialty contractors, etc. as follows:

Subcontractor Name	Address (Street, City, State)	Nature of Participation	Dollar Value of Subcontract



**EXHIBIT C
AFFIDAVIT OF NON-COLLUSION (PRIME BIDDER)**

State of _____)
S.S.

County of _____)

_____, being first duly sworn, deposes and says that:

1. They are the (owner, partner, officer, representative, or agent) of _____, the Bidder that has submitted the attached Bid;
2. They are fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;
3. Such bid is genuine and is not a collusive or sham bid; and that all statements made and fact set out in the Invitation for Bid are true and correct;
4. Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest including this affidavit, has in any way colluded, considered, connived, or agreed, directly or indirectly with any other bidder, firm, or person, to submit a sham bid in connection with the Contract for which the attached bid has been submitted or to refrain from bidding in connection with such Contract; or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other bidder, firm, or person to fix the price or prices in the attached Bid or of any other bidder, or to fix the overhead, profit, or cost element of the Bid price of the other bidder, or to secure through any collusion, conspiracy, connivance, or unlawful agreement any advantage against the City of Wentzville or any person interested in the Proposed Contact.
5. The price or prices quoted in the attached Bid are fair and proper, and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affidavit; and
6. They further certify that bidder is not financially interested in or financially affiliated with any other Bidder on this project.

Signed: _____

Title:

Subscribed and sworn to before me this _____ day of _____, 2016.

Notary Public

My Commission expires: _____

Presented as Sample Enclosure Contract #16-062
CITY - CONTRACTOR AGREEMENT
PUBLIC WORKS TRANSFER SWITCH INSTALLATION

This CITY-CONTRACTOR AGREEMENT (this "Agreement"), is made and entered into as of this ____ day of _____, 2016, by and between _____, a _____ having a principal office at _____ (the "Contractor"), and the City of Wentzville, a Missouri municipal corporation located in St. Charles County (the "City"). *All capitalized terms used and not defined herein shall have the meanings ascribed to them in the Contract Documents (as hereinafter defined).*

RECITALS

- A. In response to Invitation for Bid #16-062 for Public Works Transfer Switch Installation, the Contractor has submitted a certain bid in accordance with the Bid Documents to perform the Services.
- B. After due consideration, the City has accepted the bid of the Contractor and the parties hereto desire to enter into this Agreement whereby the Contractor shall undertake the performance of the Services in accordance with the Contract Documents and the City shall pay the Contractor as hereinafter specified.

AGREEMENT

NOW, THEREFORE, in consideration of the foregoing recitals and of the mutual promises hereinafter set forth the City and the Contractor hereby agree as follows:

1. **Contract Documents:** This Agreement shall consist of: (i) Invitation for Bid #16-062 including, without limitation:
 1. Invitation for Bids
 2. Any addendums issued to the bid
 3. Bid and Pricing Form-Exhibit A (submitted by Contractor)
 4. Subcontractor Form – Exhibit B
 5. Affidavit of Non-Collusion-Exhibit C
 6. E-Verify Memorandum of Understanding with Electronic Signatures
 7. Affidavit of Participation in Federal Work Authorization Program Form
 8. Certificate of Insurance
 9. Performance and Payment Bonds
 10. City-Contractor Agreement (executed by City and Contractor)
 11. Terms and Conditions
 12. General Conditions
 13. Notice of Award (issued by City)
 14. Notice to Proceed (issued by City)

and shall also include any exhibits to the above documents, any addenda issued prior to receipt of bids, any duly-issued modifications, and all other documents contained or specified within the specifications, details or job special provisions, as such may be on file in the Office of the Procurement Department and Office of the City Clerk of Wentzville, Missouri (all of the foregoing collectively referred to as the "Contract Documents" are hereby incorporated in this Agreement by reference).

2. **Coordination of Contract Documents:** The Contract Documents are intended to be complimentary and to describe and provide for a complete Work. In case of conflict or inconsistency among the Contract Documents, the governing ranking will be:
- (a) Job Specific Provisions (JSPs)
 - (b) Plans for Construction
 - (c) City of Wentzville Standard Specifications and Construction Details
 - (d) Exhibit A Pricing Form, Bid Items and/or Quantities

In case of conflict or inconsistency, calculated dimensions will govern over scaled dimensions. In the instance when any provision(s) of the Contract Documents not explicitly listed above conflict, the provision(s) most advantageous to the City shall govern.

All contractors, including subcontractors, shall not take advantage of any apparent error or omission in the Contract Documents. If an error or omission is discovered, the Engineer shall be notified promptly and prior to commencement of work related to said error or omission so corrections and interpretations necessary to fulfill the intent of the Contract can be made. A failure to give notice prior to commencement of work related to said error or omission shall render the effects of any error or omission noncompensable and any delay nonexcusable.

3. **Payment:** Contractor shall be paid for the quantities placed per the amount quoted on the Pricing Form Exhibit A. The Contractor shall submit all invoices complete with necessary support documentation to the City and the City shall make payment within 30 days of receipt of an invoice after satisfactory performance of the delivery and receipt of the services as shown on the Pricing Form Exhibit A. Payment Terms: net 30 days. Remit Address is Accounts Payable, 5 W. Pearce Blvd., Wentzville, MO 63385.
4. **Prompt Payment:** All public works contracts shall provide for prompt payment by the City to the Contractor (as well as prompt payment by the Contractor to the subcontractor and material supplier) unless contrary to any federal funding requirements, per RSMo 34.057.
5. **The Work/Contract Sum.** The Contractor shall furnish all labor, materials, tools, equipment and services, and perform and complete the Work required for the Project in accordance with this Agreement which shall include provision of every item specified in the Contract Documents necessary to complete the Project as designed. The Contract Sum is \$ insert dollar amount (and spell out dollar amount), which shall include all compensation to Contactor due for the Work, which shall include all such work within the Base Bid and additionally all such Work within selected Alternate Bids. Any additional Work not within the Base Bid and Alternate

Bids that is hereinafter approved by the City in writing shall be incorporated into the contract pursuant to a Change Order.

6. **Time of Completion:** Contractor shall commence work under this Agreement as specified in the Notice to Proceed and shall fully complete all items of the Work within the time set forth in the Contract Documents. The parties understand that time is of the essence and that the rate of progress and prompt completion are essential conditions, and that in the event the Work is not fully completed within the period provided herein, the Contractor shall pay to the City the sums provided in the Contract Documents.
7. **Guaranty:** The Contractor hereby expressly guarantees the aforesaid Work as to workmanship and quality of materials used in connection herewith for a term of one (1) year, commencing on the date of Final Acceptance by the City, and binds itself, its successors or assigns, to make all repairs or replacements which may become necessary within said period due to construction defects and nonconformity with the Contract Documents. Whenever notified by the City that said repairs or replacements are required, the Contractor shall at once make the same as directed at its own expense. If the Contractor does not proceed with such repairs or replacements within five (5) days after receipt of written notice, the City may use (and the Contractor agrees and consents to such use) the Maintenance Bond, according to the terms thereof, to make any necessary repairs or replacements to any portion of the Work. Upon expiration of the one (1) year guaranty period, the City shall release the Maintenance Bond, less any amounts reasonably necessary to remedy any of the Contractor's performance and/or maintenance obligations under this Agreement that may still be outstanding at the time of expiration of the guaranty period.
8. **Performance Bond:** If the Contractor's Bid is in excess of \$50,000, the Contractor shall furnish within ten (10) calendar days of notification of contract award a satisfactory Performance Bond in the full amount of the Bid based on the bid quantities listed on the Pricing Form. The Performance Bond furnished shall guarantee the faithful performance of this Contract.
9. **Payment Bond:** If the Contractor's Bid is in excess of \$50,000, the Contractor shall furnish within ten (10) calendar days of notification of contract award a satisfactory Payment Bond in the full amount of the Contract Sum. The Payment Bond furnished shall meet all requirements of Section 107.170 of the Revised Statutes of Missouri, as amended, and shall guarantee the payment of any and all materials, incorporated, consumed or used in connection with the construction of such work, and all insurance premiums, both for compensation, and for all other kinds of insurance, said work, and for all labor performed in such work whether by subcontractor or otherwise, including payment of prevailing wage requirements of the State of Missouri.
10. **Maintenance Bond:** Upon Final Acceptance the Contractor shall furnish a satisfactory Maintenance Bond in the amount of 10% of the final Contract Sum after any and all Change Orders and/or formal amendments. The Maintenance Bond shall be in full force for a one (1) year guarantee period from the date of Final Acceptance. The submitted Maintenance Bond shall be substantially in the form of the "Form of Maintenance Bond" included within the Bid Documents.

11. **Independent Contractor.** The Contractor shall be and operate as an independent Contractor in the performance of this Agreement. The Contractor shall have complete charge of the personnel engaged in the performance of the Services, and all persons employed by the Contractor shall be employees of said Contractor and not employees of the City in any respect.
12. **Contractor's Liability Insurance.** The Contractor shall obtain and maintain during the term of the Project and the City Contractor Agreement the insurance coverage's at least equal to the coverage's set forth in this paragraph 12, and as further provided in the Terms and Conditions, and General Conditions, but no event less than the individual and combined sovereign immunity limits established by Section 537.610 RSMo Insurance policies providing required coverage's shall be with companies licensed to do business in the State of Missouri and rated no less than AA by Best or equivalent. All costs of obtaining and maintaining insurance coverage's are included in the Bid Amount and no additional payment will be made therefor by the City:
- 13.

Comprehensive General Liability Insurance (including coverage for Bodily Injury and Property Damage)	\$1,000,000 per occurrence \$2,735,000 aggregate
Comprehensive Automobile Liability Insurance (including coverage for Bodily Injury and Property Damage)	\$1,000,000 per occurrence
Employer's Liability	\$1,000,000 bodily injury by accident (each accident) \$1,000,000 bodily injury by disease (each employee) \$1,000,000 bodily injury policy limit

In addition, the Contractor and all subcontractors shall provide Worker's Compensation Insurance in at least statutory amounts for all workers employed at the Project site.

The Contractor shall also provide a policy of Builder's Risk Insurance in the amount of 100% of the complete insurable value of the Project, which policy shall protect the Contractor and the City, as their respective interests shall appear.

Builder's Risk required for this Project: Yes _____ No X

Before commencing any work, the Contractor shall provide to the City certificates of insurance evidencing the issuance and maintenance in force of the coverage's required by this paragraph 12. Each such certificate shall show the City, and such other governmental agencies as may be required by the City to be insured by underlying grant or contract relating to the Project, as an additional insured, on a primary and non-contributory basis, and shall bear an endorsement precluding

cancellation of or change in coverage without at least thirty (30) days written notice to the City.

The City may waive any insurance coverage's or amounts required by this paragraph 12 when the City deems such waiver to be in the interest of the public health, safety, and general welfare.

14. **Indemnification:** To the fullest extent permitted by law, the Contractor agrees to defend with counsel approved by the City, and indemnify and hold harmless the City, its officers, engineers, representatives, agents and employees from and against any and all liabilities, damages, losses, claims or suit, including costs and attorneys' fees, for or on account of any kind of injury to person, bodily or otherwise, or death, or damage to or destruction of property, or money damages, or trespass, or any other circumstances, sustained by the City or others, arising from the Contractor's breach of the Contract or out of services or products provided by the Contractor or its subcontractors under the terms of this agreement. The Contractor shall not be liable for any loss or damage attributable solely to the negligence of the City. To the extent required to enforce this provision, the Contractor agrees that this indemnification requires the Contractor to obtain insurance in amounts specified in the Contract Documents and that the Contractor has had the opportunity to recover the costs of such insurance in the compensation set forth in this Agreement.

In any and all claims against the City or any of its agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any one of them or anyone for whose acts any of them may be liable, this indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts or other employee benefit acts.

15. **Attorney Fees' and Costs:** The Contractor shall reimburse to the City any costs and attorneys' fees that the City may reasonably incur in pursuit of any remedies at law or equity or enforcement of any rights established in this Agreement, which may result from the Contractor's breach of the Agreement, the Contractor's failure to perform any obligation or requirement contained herein, or the City's enforcement of this Agreement.

16. **Liquidated Damages:** The Contractor agrees and acknowledges that time is of the essence and that absence of reasonable progress and delay in the project becoming Available for Use, in Project Closeout, and in Final Acceptance will inconvenience the public and increase administrative costs of the City, the costs of which the Contractor and the City are incapable of ascertaining at this time. Should the Contractor, or in the case of Contractor's default, the surety, fail to complete the Work and/or receive Final Acceptance within the times stipulated in this Agreement, or within such extensions of time as may be allowed by the City in the manner set forth in the Contract Documents, the Contractor (or surety, as applicable) shall pay to the City as liquidated damages, and not as a penalty, the sum of **Five Hundred Dollars (\$500.00)** for each calendar day of delay past the allotted calendar days to achieve Available for Use (Substantial Completion) as notified by the City, plus **Two Hundred Dollars (\$200.00)** for each calendar day of delay past the allotted calendar days to achieve Final Acceptance as notified by the City.

The Contractor also agrees and acknowledges that power supply is critical to the operations of the City and that failure to provide adequate power supply to the public works facility will inconvenience the public and increase administrative costs of the City, the costs of which the Contractor and the City are incapable of ascertaining at this time. Should the Contractor, or in the case of Contractor's default, the surety, fail to provide continuous power except within the boundaries established through any authorized written approval for temporary power outages, or within such extensions of time as may be allowed by the City in the manner set forth in the Contract Documents, the Contractor (or surety, as applicable) shall pay to the City as liquidated damages, and not as a penalty, the sum of **Two Hundred Dollars (\$200.00)** for each hour of delay past the allotted hours of no power supply to the public works facility.

In the sole discretion of the City, the amount of the liquidated damages may be deducted from any money due the Contractor under this Agreement. Permitting the Contractor to finish the Work or any part thereof after the expiration of the time for completion or any approved extension, shall in no way operate as a waiver of the City of any of rights under this Agreement.

17. **Termination:** The City shall have the right to terminate this Agreement at any time for any reason by giving the Contractor written notice to such effect. The City shall pay to the Contractor in full satisfaction and discharge of all amounts owing to the Contractor under this Agreement an amount equal to the cost of all Services performed by the Contractor up to such termination date, less all amounts previously paid to the Contractor on account of this Agreement Price. The Contractor shall submit to the City its statement for the aforesaid amount, in such reasonable detail as the City shall request, within thirty (30) days after such date of termination. The City shall not be liable to the Contractor for any damages on account of such termination for loss of anticipated future profits with respect to the remainder of the Services.

18. **Compliance with Federal, State and Local Law:** The Contractor shall comply with all applicable federal, state and local law requirements for performance under this Agreement. The Contractor shall abide by all health and environmental requirements imposed by law in performance of its duties.
19. **Prevailing Wage:** The Contractor shall be required to comply with all applicable provisions concerning the payment of prevailing wages on public works projects, as provided in the General Conditions. A copy of the applicable Annual Wage Order and Incremental Increases for each occupational title required under this project is included in the Bid Documents and the Contract Documents.
20. **OSHA Required Training:** Pursuant to Section 292.675 RSMo, Contractor shall require all on-site employees to complete the ten-hour training program as required under Section 292.675 RSMo. This program shall be provided by Contractor and shall be a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for Contractor's on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Missouri Department of Labor and Industrial Relations ("MoDOLIR") which is at least as stringent as an approved OSHA program. All employees are required to complete the program within sixty days of beginning work under this Agreement. Contractor shall further require all subcontractors under Contractor to provide the ten-hour training program required under Section 292.675 RSMo. to such subcontractors' on-site employees. On-site employees who have previously completed such ten-hour training program must hold documentation of prior completion of the program.

Notice is hereby given to Contractor that it shall be subject to the penalties set forth in Section 292.675 RSMo and such penalties shall be forfeited to the City pursuant to such Section. Penalties for non-compliance include contractor forfeiture to the City in the amount of \$2,500, plus \$100 per contractor and subcontractor employee for each calendar day such employee is employed beyond the elapsed time period for required program completion under 292.675 RSMO. MoDOLIR shall investigate any claim of violation of Section 292.675 RSMo. Upon City's receipt of notification from MoDOLIR of violations of 292.675 by Contractor and a determination by MoDOLIR that penalties shall be assessed for such violations, the City shall withhold and retain from the contract all sums and amounts due and owing to the City as a result of any violation of Section 292.675 RSMo. All words in this paragraph shall have the definitions as provided in Section 292.675 RSMo.

21. **Taxes:** The City is exempt from federal excise tax and Missouri sales tax and the Contractor shall not charge the same to the City and shall comply in all respects with the Special Sales Tax Provisions of the General Conditions.
22. **Other Representations, Warranties and Other Covenants by the Contractor:** The Contractor represents and warrants that the Contractor has been engaged in such work as is required for the Services and has provided services such as the ones to be performed under this Agreement to other municipalities and/or private enterprises and that the Contractor has sufficient expertise, knowledge, information

and data, and engages sufficient personnel to perform the Contractor's obligations under this Agreement. The Contractor further represents and warrants that the Contractor is an equal opportunity employer. The Contractor agrees that the Contractor shall not use in any form or medium the name of the City for any advertising unless the Contractor receives the prior written consent of the City.

23. **Amendment; Waiver:** The City may add, delete, or amend services. No amendment, modification or waiver of any provision of this Agreement shall be effective unless in writing signed by an authorized representative of the party against whom such provision as amended or modified or such waiver is sought to be enforced. Failure to insist upon strict compliance with any of the terms or conditions of the Agreement shall not be deemed a waiver of such term or condition.
24. **Accounting.** During the period of this Agreement, the Contractor shall maintain books of accounts of its expenses and charges in connection with this Agreement in accordance with generally accepted accounting principles and practices. The City shall at reasonable times have access to these books and accounts to the extent required to verify all invoices submitted hereunder by the Contractor.
25. **Compliance with State Immigration Statutes.** As a condition for the award of this Agreement, the Contractor shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the Services. The Contractor shall also sign an Affidavit of Participation in Federal Work Authorization Program affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the Services.
26. **Governing/Choice of Law; Jurisdiction.** This Agreement shall be governed by and construed and interpreted in accordance with the internal laws of the State of Missouri, without regard to its principles of conflict of laws, and shall be deemed to be executed and performed in the County of St. Charles, Missouri. Any legal action arising out of, or relating to this agreement, shall be governed by the laws of the State of Missouri, and the parties agree to the exclusive jurisdiction and venue over them by a court of competent jurisdiction located in the County of St. Charles, Missouri, or the U.S. District Court for the Eastern District of Missouri.
27. **Headings:** The paragraph and section headings contained herein are for convenience only and are not intended to limit, vary, define or expand the content thereof.
28. **Representations.** Contractor agrees that it has not relied on any representations or warranties of the City, oral or written, other than expressly identified in this Agreement. The parties agree this Agreement represents the entire agreement between the parties.

29. **Severability:** The invalidity or unenforceability of any portion or provision of this Agreement shall not affect the validity or enforceability of any other portion or provision of this Agreement, which shall remain in full force and effect to the maximum extent permitted by law.
30. **Counterparts:** This Agreement may be executed in one or more counterparts each of which shall be deemed an original and all of which shall constitute one and the same agreement.

IN WITNESS WHEREOF, the parties hereto have caused this agreement to be executed as of the day and year first above written.

CONTRACTOR

CITY OF WENTZVILLE, MISSOURI

Signature

Nickolas Guccione, Mayor

Title

ATTEST:

Address

City, State, Zip

City Clerk

Date

Date

Public Works Transfer Switch Installation TERMS AND CONDITIONS

Independent Contractor. The Contractor shall be and operate as an independent Contractor in the performance of this Agreement. The Contractor shall have complete charge of the personnel engaged in the performance of the Services, and all persons employed by the Contractor shall be employees of said Contractor and not employees of the City in any respect.

Compliance with Laws. The Contractor shall comply with all applicable City ordinances and other laws and regulations, Federal, State, and any political subdivision thereof, including but not limited to, unemployment and workers' compensation, occupational safety, equal employment and affirmative action and wage and price laws insofar as applicable to the performance of this Agreement. In the event of a conflict between laws, codes and regulations of various governmental entities having jurisdiction over the Services, the Contractor shall notify the City of the nature and impact of such conflict.

Subcontracts. The Contractor shall not subcontract any of the Services to be performed by it hereunder without the express written consent of the City, except as provided herein. In the event Contractor utilizes a subcontractor, the Contractor shall ensure that any agreement between Contractor and such subcontractor complies with all requirement imposed for such agreement by federal, state, and local law. In addition, this Agreement shall not be assigned by the Contractor.

If the Contractor submits invoices to the City which include payments to be made on account of work performed by a subcontractor, such payments shall be conditioned upon submission by the Contractor of waiver of liens, or such other documents satisfactory to the City to protect the City's title to land, buildings, or improvements or to otherwise protect the City's interest. By submitting an invoice to the City, the Contractor warrants and guarantees that title to all land, buildings or improvements which may be subject to a lien under 429.015 RSMo, upon the receipt of such payment by the Contractor, will not be subject to a lien under 429.015 RSMo.

Indemnification. To the fullest extent permitted by law, the Contractor agrees to defend with counsel approved by the City, and indemnify and hold harmless the City, its officers, engineers, representatives, agents and employees from and against any and all liabilities, damages, losses, claims or suits, including costs and attorneys' fees, for or on account of any kind of injury to person, bodily or otherwise, or death, or damage to or destruction of property, or any other circumstances, sustained by the City or others, arising from breach of this Agreement or out of services negligently performed hereunder by the Contractor, or claims relating thereto, and including but not limited to the City's reliance on or use of the services or products provided by the Contractor under the terms of this agreement. The Contractor shall not be liable for any loss or damage attributable solely to the negligence of the City. To the extent required by law to enforce this provision, the Contractor agrees that this indemnification requires the Contractor to obtain insurance in amounts specified herein and that the Contractor has had the opportunity to recover the costs of such insurance in the compensation set forth in this Agreement.

No Aldermen, officer, administrator, director, board member, or employee of the City shall have any personal liability, directly or indirectly, under or in connection with this Agreement or any agreement made or entered into under or pursuant to the provisions of this Agreement. The Contractor shall look solely to the City for the satisfaction of any claims the Contractor may have arising under this Agreement.

Insurance. The Contractor shall furnish the City the certificates of insurance for workers' compensation, public liability, and property damage, including automobile coverage in the amounts specified by the City in the Invitation for Bids, if any, otherwise in the amounts required by the City, if any, but in no event less than the maximum amounts of liability set forth in Chapter 537.610 RSMo, as amended, applicable to political subdivisions. The policies of insurance shall be in such form and shall be issued by such company or companies as may be satisfactory to the City. In addition to the foregoing, the Contractor shall maintain Professional Liability "errors and omissions" insurance in the form for the coverages satisfactory to City as indicated in the Invitation for Bids, if any,

but in no event less than the maximum amounts of liability set forth in Chapter 537.610 RSMo applicable to political subdivisions unless otherwise approved by the City. The City, and such additional persons and entities as may be deemed to have an exposure to liability as a result of the performance of the Contractor's services, as determined by the City, shall be named as additional insured on a primary and non-contributory basis, with duty of defense on all insurance policies required hereunder.

Nondisclosure/Confidentiality. The Contractor agrees that it will preserve the confidentiality of all City data and account information and will not divulge to third parties without the written consent of the City any information obtained from or through the City in connection with the performance of this Agreement.

Changes. No change in this Agreement shall be made except in writing prior to the change in Services or terms being performed. The Contractor shall make any and all changes in the Services without invalidating this Agreement when specifically ordered to do so in writing by the City. The Contractor, prior to the commencement of such changed or revised Services, shall submit promptly to the City, a written cost or credit proposal for such revised Services. If the City and the Contractor shall not be able to agree as to the amount, either in consideration of time or money to be allowed or deducted, it shall nevertheless be the duty of the Contractor, upon written notice from the City, to immediately proceed with such alteration or change, and the Contractor shall be compensated the reasonable value of such Services. **No work or change shall be undertaken or compensated for without prior written authorization from the City and shall be subject to any required approval from state or federal departments or agencies.**

Multi-year contracts; Non-appropriation. Notwithstanding any provision herein to the contrary, the City is obligated only to make the payments set forth in the attached contract as may lawfully be made from funds budgeted and appropriated for that purpose during the City's then current fiscal year at the discretion of the City. If no funds are appropriated or otherwise made legally available to make the required payments for this Agreement during the next occurring fiscal year (an "**Event of Nonappropriation**"), this Agreement will terminate at the end of the then current fiscal year as if terminated expressly. The failure or inability of the City to appropriate funds for this Agreement in any subsequent fiscal year shall not be deemed a breach of this Agreement by any party. If applicable, this Agreement may be annually renewed at each fiscal year by inclusion of specific appropriation for this Agreement, from year to year not to exceed the maximum renewal period or term as set forth in the Agreement.

Accounting. During the period of this Agreement, the Contractor shall maintain books of accounts of its expenses and charges in connection with this Agreement in accordance with generally accepted accounting principles and practices. The City shall at reasonable times have access to these books and accounts to the extent required to verify all invoices submitted hereunder by the Contractor.

Other Contractors. The City reserves the right to employ other Contractors in connection with the Services.

Invitation for Bids. If the City issued an Invitation for Bids in connection with the Services, such Invitation for Bids and the bid of the Contractor in response thereto are incorporated herein by reference and made a part of this Agreement. In case of any conflicts between the Invitation for Bids and the executed City-Contractor Agreement or bid of the Contractor, the requirements of the City's Invitation for Bids and this executed City-Contractor Agreement shall control and supersede unless a change thereto is specifically stated in this Agreement.

Work Records and Work Product. The Contractor shall provide the City with copies of all documents pertinent to the Services which shall include, without limitation, reports, correspondence, meeting minutes, and originals of all deliverables. The City shall own all right, title and interest, including without limitations, all copyrights and intellectual property rights, to all documents and Work Product of the Contractor created in performance of or relating to this Agreement. The Contractor agrees to take all steps reasonably requested by the City to evidence,

maintain, and defend the City's ownership rights in the Work Product. Upon termination of this Agreement, the Contractor shall promptly deliver to City any documents, and work product, whether printed or electronic.

Personnel. The Services shall be performed exclusively by the personnel of the Contractor identified in the Contractor's bid and no other personnel of the Contractor shall perform any of the Services without the express written approval of the City.

Compliance with State Immigration Statutes. As a condition for the award of this Agreement, the Contractor shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the Services. The Contractor shall also sign an (Affidavit of Participation in Federal Work Authorization Program) affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the Services. The Contractor shall not be required to provide these affidavits to the City if such affidavits have been previously provided to the City within the past year. All words in this paragraph shall have the definitions as provided in Section 285.525 RSMo.

Representations. The Contractor agrees that it has not relied on any representations or warranties of the City, oral or written, other than expressly identified in this Agreement. The parties agree this Agreement represents the entire agreement between the parties.

Governing/Choice of Law; Jurisdiction. This Agreement shall be governed by and construed and interpreted in accordance with the internal laws of the State of Missouri, without regard to its principles of conflict of laws, and shall be deemed to be executed and performed in the County of St. Charles, Missouri. Any legal action arising out of, or relating to this Agreement, shall be governed by the laws of the State of Missouri, and the parties agree to the exclusive jurisdiction and venue over them by a court of competent jurisdiction located in the County of St. Charles, Missouri or the U.S. District Court for the Eastern District of Missouri.

Counterparts. This Agreement may be executed in one or more counterparts each of which shall be deemed an original and all of which shall constitute one and the same agreement.

Presented as information; not required with bid

**PROOF OF E-VERIFICATION WITH U.S. DEPARTMENT OF HOMELAND
SECURITY**

Electronic Signature Page



GENERAL CONDITIONS

SECTION 1 DEFINITIONS

- 1.01 Available for Use (Substantial Completion):** The stage in the progress of the Work when the Work is sufficiently complete so that the City can occupy or use the Work for its intended use. The date on which a Project is deemed Available for Use is in the sole discretion of the City.
- 1.02 Change Order:** A written order to the Contractor signed by the City, issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Construction Schedule.
- 1.03 City:** City of Wentzville. The City is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term City means the City or its authorized representative. The City may be alternatively referred to as the "Owner."
- 1.04 Contract:** The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations or agreements, both written and oral, including the bidding documents. The Contract may be amended or modified only by a modification as defined in Section 1.02.
- 1.05 Contract Documents:** Contract Documents shall include all those documents identified as the Contract Documents in the City-Contractor Agreement. The Contract Documents shall include any and all modifications as defined as (1) a written amendment to the Contract signed by both parties, or (2) an executed Change Order.
- 1.06 Contract Sum:** The total amount payable by the City to the Contractor for the performance of the Work as stated in the City-Contractor Agreement.
- 1.07 Contract Time/Contract Days:** Period of time allotted in the Contract Documents for substantial completion of the Work.
- 1.08 Contractor:** The Contractor is the successful bidder awarded the work of constructing the project identified as such in the City-Contractor Agreement. The Contractor is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative(s).
- 1.09 Date of Commencement of the Work:** Date established in the written Notice to Proceed on which the Contractor is to begin the Work.
- 1.10 Day:** Calendar day.
- 1.11 Director:** Director of Public Works of the City of Wentzville, or his/her authorized representative(s)
- 1.12 Final Acceptance:** Written notice from the City to the Contractor stating that the Project including all Work, any deficiencies as outlined in inspections, and all Project Closeout items and activities have been completed and the City accepts the Project. Said work shall include all

punch list items deemed necessary by the City, exclusive of punch list items generated by any public authority having jurisdiction other than the City. The date of completion of the Contract shall be the date when all work including City punch list items have been approved in writing by the City.

- 1.13 **Final Inspection:** Inspection performed and provided by the City to the Contractor upon the Contractor's request and based upon his determination that the Project is ready for final acceptance.
- 1.14 **Final Payment:** Last payment made to the Contractor, typically retainage due, upon Final Acceptance of the Project.
- 1.15 **Notice to Proceed:** Written notice from the City notifying the Contractor of the date on or before which he is to begin the work.
- 1.16 **Project:** The total construction of which the Work performed under the Contract Documents may be the whole or a part.
- 1.17 **Project Closeout:** The time period of the Work after Available for Use (Substantial Completion) when the Work and all administrative requirements have been or are being completed in their entirety. The Project Closeout period is typically 90 days.
- 1.18 **Removal:** Removal of material and disposal of said material off-site.
- 1.19 **Request for Information (RFI):** Written memo from the Contractor to the Engineer collect written information about a question in regards to the Technical Specifications or Plans for Construction. The RFI shall also be used as a means for the Contractor to seek Engineer approval for minor alterations to Plans for Construction or the Technical Specifications that do not result in a change in the Contract Sum or Project Schedule.
- 1.20 **Semi-Final Inspection:** Inspection performed and provided by the City to the Contractor upon Contractor's request and based upon his determination that the Project is Available for Use.
- 1.21 **Specifications:** City of Wentzville Construction Specifications and Standard Details, latest edition, unless otherwise specified.
- 1.22 **Subcontractor:** A Subcontractor is a person or organization who has a direct contract with the Contractor to perform any of the Work. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.
- 1.23 **Sub-subcontractor:** A Sub-subcontractor is a person or organization who has a direct or indirect contract with a Subcontractor to perform any of the Work. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.
- 1.24 **Work:** All labor necessary to complete the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in such construction.

SECTION 2 CONTRACT DOCUMENTS

2.01 Execution, Correlations, and Intent

2.01.1 The Contract Documents shall be signed by the City and Contractor.

2.01.2 The Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

2.01.3 The intention of the Contract Documents is to include all labor, materials, equipment and other items necessary for execution and completion of the Work. Words which have well-known technical or trade meanings are used herein in accordance with such recognized meanings.

2.02 Copies Furnished and Ownership

2.02.1 Unless otherwise provided in the Contract Documents, the Contractor will be furnished a maximum of five (5) copies, free of charge, of the Drawings and Specifications, if any, for the execution of the work.

2.02.2 Any Drawings, Specifications and copies thereof furnished by the City are and shall at all times remain property of the City. Such documents shall not be used on any other project. At the conclusion of the job, the Contractor shall submit one (1) set of drawings and specifications marked up throughout the course of work with any and all field changes.

SECTION 3 CITY

3.01 City's Right to Access and Observation

The City shall have access at all times to the Project for the purpose of observation and inspection. The Contractor shall provide proper and adequate facilities, specialized, tool and equipment for such access and observation.

3.02 City's Right to Stop Work

If the Contractor fails to correct defective Work or fails to supply materials or equipment in accordance with the Contract Documents, the City may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

3.03 City's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, or fails to perform any provision of the Contract, the City may, after written notice to the Contractor and without prejudice to any other remedy the City may have, make good such deficiencies. In such case an appropriate Change Order shall be issued deducting from the payments then or hereafter due the Contractor the cost of correcting such deficiencies. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the City promptly upon request.

3.04 City's Right to Award Separate Contracts

The City's reserves the right to award other contracts on other terms and conditions with other portions of the Project.

3.05 City's Right to Clean Up

If a dispute arises between separate contractors as to their responsibility for cleaning up as required by Section 4.08, the City may clean up and charge the cost thereof to the several contractors.

3.06 Status of the Director

The Work shall be subject at all times to the supervision and direction of the Director. To prevent disputes and litigation, it is mutually agreed that the Director shall, in all cases, determine the amount or quantity of the various kinds of work, and the quality of materials and workmanship to be paid for under this Contract, and the Director shall decide all questions which may arise relative to the performance of the work covered by the Contract. Any doubt as to the meaning of the Contract and any obscurity or discrepancy as to their working and intent will be explained by the Director, and this explanation shall be final and binding by both parties of this Contract. The Director may amend or correct any errors or omissions in the Specifications when such amendments or corrections are necessary to make definite the intent indicated by a reasonable interpretation of the Contract.

3.07 Authority of the Engineer

The Engineer will decide all questions that may arise as to the quality, quantity, and acceptability of material furnished and the work performed, and as to the rate of progress of the work; all questions that may arise as to the interpretation of the plans and specification; all questions of classification; quantities for which payment will be made, performance or breach of the contract; and all claims or controversies of any character whatsoever in connection with or growing out of the construction, whether claimed under the contract, under force account, under quantum merit or otherwise. The engineer's estimates and decisions shall be final, binding and conclusive upon all parties to the Contract. The Engineer may suspend any work that is being improperly performed.

3.08 Authority and Duties of Inspector

As the immediate representative of the City, the Inspector has direct charge of the delivery of work and is delegated commensurate authority for the administration of the project. The Inspector may reject defective material and reject any work that is being improperly performed. The Inspector may also make recommendations to the Engineer to suspend work that is being improperly performed. The Inspector will have no authority to modify the Contract except in accordance with the Contract Documents or when expressly authorized by the Engineer.

SECTION 4 CONTRACTOR

4.01 Supervision and Construction Procedures

4.01.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work.

4.01.2 All Work shall be in accordance with the Contract Document and Specifications.

4.01.3 The contractor shall have at the work site at all times, as the contractor's agent, a competent individual capable of reading and thoroughly understanding the plans and specifications and thoroughly experienced in the type of work being performed, whom shall receive instructions from the engineer. That individual shall have full authority to execute orders or directions of the engineer without delay and to promptly supply material, equipment, tools, labor and incidentals as may be required.

4.02 Labor and Materials

4.02.1 Unless otherwise specifically noted, the Contractor shall provide and pay for all labor, materials, equipment, supplies, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

4.02.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him. If the City reasonably objects to any person employed by the Contractor, the employee shall be immediately dismissed.

4.02.3 The labor provided by the Contractor shall be directed to be a workman-like character with respect to the methods of construction and quality of completed work; and, shall not encumber the premises or adjacent property or streets with materials and/or equipment.

4.02.4 The Contractor shall comply with, and is bound by, the provisions of Missouri law pertaining to the payment of wages on public works projects contained in Sections 290.210 through 290.340 RSMo., and any amendments thereto, including, but not limited to the following:

4.02.4.1 In accordance with Section 290.250 RSMo., as amended, the Contractor shall not pay less than the prevailing hourly rate of wages specified by the Missouri Department of Labor and Industrial Relations Division of Labor Standards to all workmen performing Work under the Contract.

4.02.4.2 In accordance with 290.250 RSMo., as amended, the Contractor shall forfeit as a penalty to the City one hundred dollars (\$100.00) for each workman employed for each calendar day, or portion thereof, such workman is paid less than the said stipulated rates for any Work done under the Contract, by him or by any Subcontractor under him and shall include provisions in all bonds guaranteeing the faithful performance of said prevailing hourly wage clause.

4.02.4.3 In accordance with 290.265 RSMo., as amended, the Contractor and each Subcontractor shall post a clearly legible statement of all prevailing hourly wage rates to be paid to all workmen employed to complete the Work in a prominent and easily accessible place at the site of the Work and such notice shall remain posted during the full time that any workmen shall be employed at the Work.

4.02.4.4 Certified payrolls shall also be submitted prior to final payment for all work completed by the Contractor or Subcontractors.

4.02.4.5 In accordance with Section 290.290 RSMo., as amended, before final payment is made an affidavit must be filed by the Contractor stating that he has fully complied with the prevailing wage law. No payment shall be made unless and until this affidavit is filled in proper form and order.

4.02.5 The Contractor shall execute and complete the Work in such a manner that avoids jurisdictional and other disputes among labor unions.

4.02.6 Except as otherwise required by law, during a period of excessive unemployment in the State of Missouri, the Contractor shall employ only Missouri laborers and laborers from nonrestrictive states on the Project, as provided in Sections 290.550 to 290.580 RSMo.

4.02.7 If the Contract Documents have indicated that the Project is financed in whole or in part from Federal funds, then this Contract shall be subject to all applicable federal statutes, rules and regulations, including provisions of the Davis-Bacon Act, 40 U.S.C. §3141 et seq., and the "Federal Labor Standards Provisions," incorporated into this Contract. Where the Missouri Prevailing Wage Law and the Davis-Bacon Act require payment of different wages for work performed under this Contract, the Contractor and all Subcontractors shall pay the greater of the wages required under either law.

4.02.8 The Contractor shall employ only personnel authorized to work in the United States in accordance with applicable federal and state laws. This certification applies to State of Missouri Immigration Alien Laws and statutes required local government(s) to have proof of a person's lawful presence within the United States before distributing "Public Benefits" (contracts, purchase orders, etc.) to that Bidder.

4.03 Warranty

The Contractor warrants to the City that all materials and equipment furnished under the Contract and incorporated in the Work will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not so conforming to these standards shall be considered defective. The Contractor shall furnish satisfactory evidence as to the kind and quality of all materials and equipment and shall guaranty the Work as provided in the City Contractor Agreement after substantial completion of the work.

4.04 Permits, Fees, Easements, Construction Limits and Notices

4.04.1 The Contractor shall secure and pay for all permits, governmental fees, and licenses necessary for the proper execution and completion of the Work, including those required to be obtained from the City, except fees imposed solely by the City shall be waived at the time of application.

4.04.2 For the purposes of operating and maintaining the Project, the City shall acquire the necessary lands, easements and rights-of-way privileges required for the same. The Contractor shall furnish and construct any necessary access roads or facilities.

4.04.3 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the Work. If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the City in writing and any necessary changes shall be adjusted by appropriate Modification. If the Contractor performs any Work knowing it to be contrary to such

laws, ordinances, rules and regulations and without such notice to the City, the Contractor shall assume full responsibility therefor and shall bear all costs attributable thereto.

4.04.4 The construction limits consist of public areas and acquired easement areas, as shown in the Contract Documents. The Contractor shall limit his operations accordingly. No activity outside the public areas or easement areas shall be performed without the express written permission of the property owner.

4.04.5 The Contractor shall notify in writing all residents whose property is affected by the Work at least forty-eight (48) hours prior to commencement of any operation that will affect the residents' property. The City, before commencement of work on the Project, shall review and approve the form of all such notices.

4.05 Superintendent

4.05.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance on the Project site at all times during the progress of all work for the duration of the total project.

4.05.2 This person shall be a non-working superintendent who will be responsible for the satisfactory progression of the work and to ensure that all work is being completed in accordance with the plans and specifications. He is also to relay any conflicts or discrepancies that arise in the plans to the City's representative for resolution or interpretation.

4.05.3 The name of the person selected as superintendent and his qualifications shall be submitted and shall be approved in writing by the City. The superintendent shall not be changed except with the written consent or at the request of the City. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor.

4.05.4 The superintendent shall be the contact person whom the City will contact in the event of after-hours and weekend emergencies and the Contractor shall provide the City with the superintendent's contact information for such purpose.

4.06 Responsibility for Those Performing the Work and for the Work

4.06.1 The Contractor shall be responsible to the City for the acts and omissions of all his employees, all Subcontractors, and suppliers their agents and employees and all other persons performing any of the Work under a contract with the Contractor.

4.06.2 The Contractor shall at all times employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by these specifications. All workmen shall have sufficient skill and experience to perform properly the work assigned to them.

4.06.3 Prior to the completion of the work by the Contractor and the acceptance thereof by the Owner, the work shall remain at the risk of the Contractor; and said Contractor shall be required to repair, replace, renew, and make good, at his own expense, all damages caused by force, vandalism, or violence of the elements or any other cause whatsoever provided; however, that in such cases the Contractor shall be entitled to a reasonable extension of time which to complete said work. In case of suspension of work from any cause whatever, the Contractor shall be responsible for the project and shall take such precautions as may be necessary to prevent damage to the project, for normal drainage, and shall erect any necessary warning signs or barricades at his expense. The Contractor shall properly and continuously maintain the roadway for local traffic.

4.07 Drawings and Specifications at the Site

4.07.1 The Contractor shall maintain at the site for the City one copy of any Drawings, Specifications, Addenda, approved Shop Drawings, Requests for Information, Change Orders and other Modifications, in good order and marked to record all changes made during construction.

4.07.2 The Drawings, marked to record all changes made during construction, shall be delivered to the City upon completion of the work. The Contractor shall also maintain on the project site a survey level, legs, and rod at all times, which are deemed adequate by the City.

4.08 Cleaning Up

4.08.1 The Contractor shall at all times keep the premises free from accumulation of waste materials, rubbish, and debris caused by his operations. The Contractor shall not “stockpile” any material on the jobsite and all excavated material shall be hauled off the site at the time of excavation.

4.08.2 Stockpiling of materials delivered and used on the same day will be allowed if all materials are in place or removed at the end of the day. Prior to final payment, Contractor shall restore and replace the surfaces of the project area to match the conditions existing prior to the work.

4.08.3 The Contractor shall be responsible for keeping clean, i.e. free from mud, dirt, rock, and debris at all times all City streets used by the Contractor in connection with the Work and the Project. Should any accumulation be deemed excessive, the City may direct the Contractor to thoroughly wash or remove the debris from the street at no cost to the City.

4.08.4 The Contractor shall make satisfactory arrangements to store material and equipment after delivery and during construction off of the City right-of-way. The City will assume no responsibility for these arrangements.

4.09 Utilities

4.09.1 Interference with Existing Water and Sewer Services and Mains

4.09.1.1 The Contractor shall minimize the outage of water and sewer service to residents. The cutting off of water and sewer service shall be only with the consent of the City. The Contractor shall notify the City and have their approval prior to commencing work on each water or sewer main or connection item.

4.09.1.2 The Contractor shall conduct his work in such a manner as not to endanger existing water or sewer mains, services or appurtenances. Mains and services shall be adequately supported where they cross or are adjacent to the excavation. The Contractor shall bear the cost of all repairs to water or sewer mains or appurtenances damaged because of his own carelessness or neglect.

4.09.1.3 When it becomes necessary to shut down any existing water or sewer main, a representative of the City shall be present during this operation. The total time for the main to be shut down should be held to a minimum and in no case shall any customer be without water or sewer service for more than eight (8) hours. The Contractor shall notify each water or sewer customer whose water or sewer service will be interrupted at least one hour prior to shut down. The Contractor shall assume full responsibility for shutting down the main and notifying the customers.

4.09.2 Coordination with Utilities

The Contractor shall contact and coordinate with all affected utilities prior to commencing any operations. Prior to commencement of any work involving excavation, demolition of facilities or the erection of posts, it will be the sole responsibility of the Contractor to notify all utilities of the planned work and request that the utilities suitably mark underground installations in the vicinity of the planned work, and arrange for disconnection of any necessary utilities.

4.10 Cash Allowances

The Contractor acknowledges and agrees that the Contract Sum includes all cash allowances as may be specified in the Contract Documents.

4.11 Equal Employment Opportunity

The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, or disability. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment; advertising; layoff or termination; rates of pay or other forms of compensation; and selection of training, including apprenticeship. The Contractor shall state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, or disability. The Contractor shall incorporate the foregoing requirements of this paragraph in all of its subcontracts for work performed under the terms and conditions of this Contract. A breach of this provision may be grounds for Contract termination.

4.12 Accident Prevention: OSHA

4.12.1 In the performance of this Contract, the Contractor shall comply with all applicable Federal, State, county and local laws governing safety health and sanitation. The Contractor and any subcontractor shall not require any worker or mechanic employed in performance of this Contract to work in surroundings or other working conditions which are unsanitary, hazardous, or dangerous to his health or safety, as determined under Construction Safety and Health Hazards, Title 29, Code of Federal Regulations, Part 1926.

4.12.2 The Contractor shall require all on-site employees to complete a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program provided by the contractor which includes a course in construction safety and health approved by OSHA or a similar program approved by MoDOLIR which is at least as stringent as an approved OSHA program, as required under Section 292.675 RSMo. All employees are required to complete the program within sixty days of beginning work under this contract. The successful bidder shall also require all subcontractors under the contractor to provide the ten-hour training program required under Section 292.675 RSMo. to such subcontractors' on-site employees.

SECTION 5 SUBCONTRACTORS

5.01 Award of Subcontracts and other Contracts for Portions of the Work

5.01.1 Unless otherwise specified in the Contract Document, the Contractor shall submit a completed Subcontractor Form, naming each Subcontractor and Supplier the Contractor proposes to employ in performing the Work under this Contract and describing the portions of the Work each proposed Subcontractor shall perform or supply, along with other required Contract documents to the City. Contractor shall complete and submit a Subcontractor Form to the City in the event of any substitution or addition of a Subcontractor by the Contractor.

5.01.2 Prior to the award of the Contract, the City will notify the Bidder in writing if the City, after due investigation, objects to any such person or entity proposed by the Bidder pursuant to Section 5.01.1 above. If the City objects to any such proposed person or entity, the Bidder may, at his option, (1) withdraw his Bid, or (2) submit an acceptable substitute person or entity with no adjustment in his bid price.

5.01.3 The City reserves the right to reject a Subcontractor, if in the City's sole discretion, delays may result in the performance of Work as a result of a Subcontractor's other obligations. The Contractor shall be held responsible, in addition to the submission of the Subcontractor Utilization Form, to apprise the City of any additional work which a Subcontractor accrues throughout the duration of the project. This shall include work for the City under a different Contract, or any other person or entity. If such said additional work shall detrimentally impact the progression of the Work under this Contract, the City retains the right to require the Contractor to submit a substitute Subcontractor for this work at no additional cost to the City.

5.01.4 The Contractor shall not contract with any Subcontractor or any person or organization (including those who are to furnish materials or equipment fabricated to a special design), for proposed proportions of the Work designated in the Contract Documents or, if none is so designated, with any Subcontractor proposed for the principal portions of the Work, who has been rejected by the City.

5.01.5 If the City requires a change of any proposed Subcontractor or person or organization during the execution of the Work approved under the Contract, the Contract Sum shall be increased or decreased by the difference in cost resulting from such change and an appropriate Change Order shall be issued.

5.01.6 The Contractor shall not make any substitution for any proposed Subcontractor or person or organization that has not been accepted by the City prior to the Contract Award, unless the substitution is accepted by the City in writing prior to such substitution.

5.02 Subcontractual Relations

5.02.1 All work performed for the Contractor by a Subcontractor shall be pursuant to an appropriate agreement between the Contractor and Subcontractor (and where appropriate between Subcontractors and Sub-subcontractors) which shall contain provisions that:

5.02.1.1 Require the Work to be performed in accordance with the requirements of the Contract Documents;

5.02.1.2 Require submission to the Contractor of applications for payment under each subcontract to which the Contractor is a party, in reasonable time to enable the Contractor to apply for payment in accordance with Section 9 hereof;

5.02.1.3 Require that all claims for additional costs, extensions of time, damages for delays or otherwise with respect to subcontracted portions of the Work shall be

submitted to the Contractor (via any Subcontractor or Sub-subcontractor where appropriate) in sufficient time so that the Contractor may comply in the manner provided in the Contract Documents for like claims by the Contractor upon the City;

5.02.1.4 Waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by the property insurance described in Section 11, except such rights as they may have to the proceeds of such insurance held by the City as trustee under said Section 11;

5.02.1.5 Obligate each Subcontractor specifically to consent to the provisions of this Section 4.03;

5.02.1.6 Require the Subcontractor (and the Sub-subcontractor) to indemnify and hold harmless the City against all claims, damages, losses, expenses and attorneys' fees arising out of or resulting from the performance of the Work by Subcontractor, and its agents and employees, unless such claims, damages or losses are caused solely by the negligent act of the City.

5.03 Payment to Subcontractors

5.03.1 The Contractor shall pay each Subcontractor upon receipt of payment from the City, an amount equal to the percentage of completion allowed to the Contractor on account of such Subcontractor's Work, less the percentage retained from payments to the Contractor. The Contractor shall also require each Subcontractor to make similar payments to his Subcontractors.

5.03.2 If the City withholds payment to the Contractor for any cause which is the fault of the Contractor and not the fault of a particular Subcontractor, the Contractor shall pay that Subcontractor on demand for its Work to the extent completed.

5.03.3 The City shall not have any obligation to pay or to see to the payment of any sum to any Subcontractor or Sub-subcontractor.

SECTION 6 SEPARATE CONTRACTS

6.01 Mutual Responsibility of Contractors

6.01.1 The Contractor shall afford other contractors reasonable opportunity for the delivery and storage of their materials and equipment and the execution of their work, and shall properly connect and coordinate the Work with theirs. The Contractor shall employ, insofar as possible, such methods and means in carrying out the Work as will not cause any interruption or any interference with any other contractor.

6.01.2 If any part of the Work depends for proper execution or results upon the work of any other separate contractor, the Contractor shall inspect and promptly report to the City any apparent discrepancies or defects in such work that render it unsuitable for proper execution of the Work. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper to receive the Work, except as to defects which may develop in the other contractor's work after the execution of the Contractor's Work that could not have been discovered by the Contractor upon reasonable inspection.

6.01.3 If the Contractor causes damage to the work or property of any other contractor on the Project, and such separate contractor sues the City or initiates an arbitration proceeding on account of any damage alleged to have been so sustained, the City shall notify the Contractor who shall defend such proceedings at his own expense, and if any judgment or award against the City arises therefrom the Contractor shall pay or satisfy it and shall reimburse the City for all attorneys' fees and court arbitration costs which the City has incurred.

SECTION 7 MISCELLANEOUS PROVISIONS

7.01.1 Governing Law. The Contract shall be governed by and construed and interpreted in accordance with the internal laws of the State of Missouri, without regard to its principles of conflict of laws, and shall be deemed to be executed and performed in the County of St. Charles, Missouri. Any legal action arising out of, or relating to this agreement, shall be governed by the laws of the State of Missouri, and the parties agree to the exclusive jurisdiction and venue over them by a court of competent jurisdiction located in the County of St. Charles, Missouri, or the U.S. District Court for the Eastern District of Missouri. The Contractor shall at all times observe and comply with all Federal and State laws, all local laws, ordinances, and regulations existing at the time of or enacted subsequent to the execution of the Contract which, if in any manner, affect the Work.

7.01.2 The Contractor and his surety shall indemnify and save harmless the City and all of its representatives, engineers, consultants, and employees against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by himself, his employees, or his subcontractors.

7.01.3 Changes may be made to this contract as a result of any ordinance, law and/or directive issued by the City and/or the State of Missouri and/or the Federal Government. Should such a change occur the Contract shall be amended reflecting such change and signed by both parties acknowledging the change(s).

7.02 Successors and Assigns

The City and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract without the prior written consent of the other, nor shall the Contractor assign any sums due or to become due to him hereunder, without the prior written consent of the City.

7.03 Notices

Any notice to any party pursuant to or in relation to the Contract shall be in writing and shall be deemed to have been duly given when delivered in person to the individual or member of the firm or to an officer of the corporation for whom it was intended, or when deposited in the United States mail, registered or certified with postage prepaid addressed to the last business address known to the party giving the notice.

7.04 Rights and Remedies

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

7.05 Royalties and Patents

The Contractor shall pay all royalties and license fees payable on all designs, processes or products used in connection with the work or incorporated therein, unless otherwise agreed upon by the City. The Contractor shall defend all suits or claims for infringement of any patent rights and shall indemnify and hold the City harmless from and against any loss on account thereof.

SECTION 8 TIME

8.01 Progress and Completion

8.01.1 All time limits stated in the Contract Documents are of the essence of the Contract.

8.01.2 The Contractor shall begin the Work on the date of commencement provided in the Notice to Proceed.

8.01.3 The Contractor shall carry the Work forward expeditiously with adequate forces and shall make the Project Available for Use (Substantially Complete) within the allotted number of Days as provided for in the Contract Documents and in accordance with the construction schedule.

8.01.4 The Contractor shall complete Final Acceptance within 90 days of the Project being deemed Available for Use (Substantially Complete). Delay of Final Closeout can result in liquidated damages.

8.02 Hours of Work

The Contractor shall not perform any work nor move any equipment except between 7:00 A.M. and 6:00 P.M. Monday through Friday without the written consent of the City. No work shall be done on Saturday, Sunday, or City holidays, unless approved by the City in advance.

Unauthorized Work done outside of the working hours stated above is subject to rejection and removal and replacement at the Contractor's expense.

8.03 Overtime

If overtime work is authorized, as per Section 8.02, and the Contractor fails to appear as scheduled, the City shall deduct the cost for the City's assigned personnel from the Contract Sum for the time period schedule.

8.04 City Holidays

No Work by the Contractor or Subcontractors shall be performed on City Holidays. Only Work considered "emergency work" shall be allowed, and shall be approved in advance by the Director. The following is a list of City Holidays:

New Year's Day, Martin Luther King Day, Presidents Day, Good Friday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, Christmas Eve, Christmas Day

8.05 Delays, Extensions of Time

8.05.1 Should the Contractor be delayed at any time during the execution of the Work by changes in the scope of work, or by strikes, lockouts, fire, unusual transportation delays, unavoidable casualties, or other delay beyond the control of and not reasonably foreseeable by the Contractor and such delay is approved by the City, the time for completion shall be extended for a period commensurate with the period of the delay by Change Order.

8.05.2 In such event, the Contractor shall submit a written request for a time extension within seven (7) calendar days of the occurrence of the event causing the delay.

8.05.3 Inclement weather shall not be considered a valid reason for extension of time, unless abnormal for the season and place of work. The Contractor shall make proper allowance for inclement weather in the bid submitted.

8.05.4 In case of continuing delay, a single request for time extension by the Contractor shall be sufficient.

8.06 Liquidated Damages

Time is of the essence with this Project and delay in the project becoming Available for Use and/or in Final Acceptance will inconvenience the public and increase administrative costs of the City, the costs of which are inherently difficult to quantify and which the City is incapable of ascertaining at this time. Should the Contractor, or in the case of Contractor's default, the surety, fail to complete the Work and/or receive Final Acceptance within the times stipulated in this Contract, or within such extensions of time as may be allowed by the City in the manner set forth in the Contract, the Contractor (or surety, as applicable) shall pay to the City liquidated damages, as chargeable per the Contract, not as a penalty, but rather as a reasonable measure of the damages, based on the City's experience and given the nature of the losses that may result from delay. **Refer to the City-Contractor Agreement, Liquidated Damages paragraph 16 for details.**

8.07 Suspension of Work:

The Engineer may suspend the work or any portion thereof by written notice to the contractor, which notice shall fix the date on which work shall be resumed. The Contractor will resume that work on the date so fixed. The Contractor will be allowed an extension of the contract time, directly attributable to any suspension.

SECTION 9 MEASUREMENT OF QUANTITIES, PAYMENTS, AND COMPLETION

9.01 Measurement of Quantities

Unless otherwise directed within the Job Specific Provisions, Technical Specifications and/or Methods of Measurement and Payment, the quantities for which payment will be made shall be those shown in the Contract for the various items, provided the project is constructed as shown on the plans.

9.01.1 When the plans have been altered or when disagreement exists between the Contractor and the City as to the accuracy of the plan quantities of any balance, or the entire project, either party shall have the right to request a recomputation of contract quantities within any area, by hand calculation of the average-end-area method for cubic yard quantities, and standard measurement methods for other quantities, by written notice to the other party. The written notice shall contain evidence that an error exists in the original elevation or in the original computations which will affect the final payment quantity in excess of 15%. When such final measurement is required, it will be made from the latest available ground surface and the design section.

9.01.2 By Weight. These specifications require that the Contractor must furnish the representative of the City, on the job site, with original weight certificates on a daily basis signed by a bonded weigh master for all materials supplied by the Contractor that are incorporated into this work, which payment therefore is based on weight.

9.02 Application for Payment

9.02.1 The Contractor shall submit requests for payment not more than once monthly upon substantial completion of various stages of the Work, and upon final completion of the Work.

9.02.2 The request for payment shall be submitted to the City as an itemized Application for Payment pursuant to the City-Contractor Agreement on such forms and supported by such data substantiating the Contractor's right to payment as the City may require.

9.02.3 If payments are to be made on account of materials or equipment to be incorporated into the Work and delivered and suitably stored at the site, such payments shall be conditioned upon submission by the Contractor of bills of sale, waiver of liens, or such other documents satisfactory to the City to establish the City's title to such materials or equipment or to otherwise protect the City's interest.

9.02.4 By submitting an Application for Payment, the Contractor warrants and guarantees that title to all Work, materials and equipment covered by such Application for Payment, whether incorporated into the Work or not, will pass to the City upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests or encumbrances (hereinafter referred to as "liens").

9.03 Payment

9.03.1 If the Contractor has made Application for Payment as above, the City will make payment to the Contractor for such amount as it determines to be properly due pursuant to the Contractor's Application for Payment, or state in writing the City's reasons for withholding all or any portion of such payment within 30 days of the latter of:

9.03.1.1 Delivery of materials or construction services;

9.03.1.2 Date of Request for Payment or date Request for Payment is received;
or

9.03.1.3 In those instances in which the Contractor approves the Owner's estimate for payment, the date upon which such notice of approval is duly delivered.

9.03.2 Five percent (5%) of the amount of each monthly request for payment shall be withheld until after completion by the Contractor and acceptance by the City of all Work. Exception: the Contractor is not required to provide a bond if the project is less than \$50,000 and City determines that a higher rate of retainage is required to ensure performance of the Contract, the retainage may be increased to ten percent (10%).

9.03.3 No progress payment, nor any partial or entire use or occupancy of the Work by the City, shall be evidence of the satisfactory performance of the Work, either wholly or in part, or constitute an acceptance of any Work that is defective or improper or not otherwise completed in accordance with the Contract Documents.

9.04 Prompt Payment

9.04.1 All public works contracts shall provide for prompt payment by the City to the Contractor (as well as prompt payment by the Contractor to the subcontractor and material supplier) unless contrary to any federal funding requirements, per RSMo 34.057.

9.04.2 Retainage withheld on any construction contract for public works projects shall not exceed five percent (5%) of the value of the contract. If the Contractor is not required to obtain a bond under RSMo 107.170 because the cost of the public works contract is not estimated to exceed fifty thousand dollars, the City may withhold retainage on the public works project in an amount not to exceed ten percent (10%) of the value of the contract.

9.04.3 The City shall make progress payments to the Contractor on at least a monthly basis as the work progresses, or, on a lump sum basis according to the terms of the lump sum contract.

9.04.5 If the City determines the work is not substantially completed and accepted, the City must provide written explanation of why the work is not accepted with 14 calendar days of the request for payment of retainage. If a written explanation is not provided, the City is required to release 98% of the retainage withheld within 30 days.

9.04.6 Nothing in this section shall prevent the City from withholding payment or final payment from the Contractor. Reasons for withholding payment or final payment shall include, but not be limited to, the following: liquidated damages; unsatisfactory job progress; defective construction work or material not remedied; disputed work; failure to comply with any material provision of the contract

9.05 Completion and Final Payment

9.05.1 Upon the Contractors determination that the Project is Available for Use, ready for final inspection and acceptance, and upon receipt of a final Application for Payment, the City will promptly make such inspection. Any defects arising out of said inspection will be provided to the Contractor in writing and shall be promptly remedied at no additional cost to the City. When the City finds the Work acceptable under the Contract Documents and the Director has determined the Project is Available for Use, the City will make payment to the Contractor, less the total retainage, any penalties assessed against Contract and authorized by law to be withheld by the City from its payment to the Contractor, and less any moneys which are due and payable to the City as liquidated damages.

9.05.2 Upon the Director's determination that the Project is Available for Use, the Contractor shall complete Project Closeout within 90 days. Retainage payment shall not become due until the Contractor completes the Project Closeout, including addressing any and all deficiencies as noted in the Final Inspection, and submits the following, at a minimum, to the City:

9.05.2.1 An Affidavit that all payrolls, bills for materials and equipment, and other indebtedness incurred in connection with the execution and completion of the Work for which the City or its property might in any way be responsible, have been paid or otherwise satisfied

9.05.2.2 Consent of the surety, if applicable, to final payment

9.05.2.3 An affidavit stating the Contractor has fully complied with the provisions and requirements of the Prevailing Wage Law, Section 290.210 through 290.340 RSMo., as amended,

9.05.2.4 Other data, as required by the City, establishing payment or satisfaction of all such obligations, such as receipts and releases arising out of the Contract, to the extent and in such form as may be designated by the City

9.05.2.5 Maintenance Bond.

9.05.3 If any Subcontractor refuses to furnish a release or waiver required by the City, the Contractor may furnish a bond or other agreement satisfactory to the Director indemnifying the City against any liability relating to such Subcontractor. If any such claimed liability remains unsatisfied after all payments are made, the Contractor shall refund to the City all moneys that the City incurs or may be compelled to pay in discharging such claimed liability, including all costs and reasonable attorneys' fees.

9.05.4 The acceptance of final payment shall constitute a waiver of all claims by the Contractor, except those previously made in writing and still unsettled.

SECTION 10 PROTECTION OF PERSONS AND PROPERTY

10.01 Safety Precautions and Programs

Public safety is of the utmost importance and is the sole responsibility of the Contractor to provide, erect, and maintain adequate protection throughout the project to protect the public. The Contractor shall initiate, maintain and supervise safety precautions and programs in connection with the performance of the Work.

10.02 Safety of Persons and Property

10.02.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

10.02.1.1 The general public;

10.02.1.2 All employees on the Work and all other persons who may be affected thereby;

10.02.1.3 All the Work, all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and

10.02.1.4 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, sprinkler systems, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.02.1.5 All survey monuments and property markers which shall be carefully preserved in place by the Contractor who shall be responsible for the correct replacement of all such monuments and markers disturbed during the work.

10.02.1.6 Any and all channels, swales, pipes, culverts, and all drainage structures in the project area; the Contractor shall provide for normal drainage and shall continuously maintain channels, swales, pipes, culverts, and all drainage structures in the project area. The Contractor is responsible for any damage caused by his failure to provide and maintain normal drainage.

10.02.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction over the safety of persons or property to protect them from damage, injury or loss. The Contractor shall erect and maintain all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying the City and users of adjacent utilities. The Contractor shall provide signs, barrels, or any other safety devices which the City deems necessary for public safety. No additional payment will be made and this work shall be considered incidental to the Contract. The City will place safety devices as it deems necessary if the Contractor fails to provide the required items within 24 hours of notification. The Contract Sum shall be reduced by the cost of these devices.

10.02.3 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.02.4 All damage or loss to any property caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by anyone for whose acts they may be liable, shall be remedied by the Contractor. The City shall document any complaint by any person regarding damage or loss to property caused by Contractor by

requesting such complainant to complete a Damage Claim form. A copy of the Damage Claim form shall be submitted by the City to the Contractor and the Contractor shall correct the problem, repair such damage or otherwise compensate the complainant or file a claim for such damage with Contractor's insurance company within ten (10) days of the receipt of the Damage Claim form from the City. If the City shall have a legitimate basis for believing that such claim is valid, the City shall have the option to withhold payment of funds until (i) such damages are repaired; or (ii) the City has been provided with evidence that that Contractor has made restitution to the complainant.

10.02.5 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the City.

10.02.6 All traffic control devices shall conform to the "Manual on Uniform Traffic Control Devices" for Streets and Highways", Current Edition. At all times until final acceptance of the Work, the Contractor shall provide and maintain at his own expense such signs, lights, watchmen, fences, and barriers as may be necessary to properly protect the work and provide for safe and convenient public travel. The Contractor shall provide the Owner with the name and telephone numbers of an individual who shall be on 24-hour call for erection and maintenance of the protection devices. The cost of any erection or maintenance of the warning or protection devices by City Forces may be filed against the Contractor's monthly or final statement without any notice to the Contractor. The Director shall, in all cases, determine questions which may arise relative to additional traffic control devices. No payment, as such, will be made because of these requirements; but the cost thereof will be considered as fully covered by the prices paid for other items of work. Failure to properly provide traffic control devices in accordance with this section, the City will issue one written warning and a 24-hour grace period for the Contractor to obtain the necessary traffic control devices. The second infraction, the City will place traffic control devices at a cost of thirty-five dollars (\$35) per day per traffic control device. The cost of the traffic control devices will be deducted from the Contractor's monthly invoice.

SECTION 11 INSURANCE

11.01 Contractor's Liability Insurance

11.01.1 The Contractor shall purchase and maintain such insurance required in the Contract Documents to protect him from claims which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

11.01.2 The insurance shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater, and shall include contractual liability insurance as applicable to the Contractor's obligations for indemnification and reimbursement of attorneys' fees and costs under the Contract Documents.

11.01.3 Certificate(s) of Insurance acceptable to the City shall be filed with the City prior to commencement of the Work. Certificate(s) of Insurance must state: "The City of Wentzville, Missouri is additional insured." These Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least 30 days prior written notice has been given to the City.

11.01.4 Any certificate or other evidence of insurance, submitted to the City, shall be in a form acceptable to the City. In the case of policies written by companies organized in a state other than Missouri, the certificate of insurance, or other evidence submitted, shall be countersigned by a Missouri resident agent of such company.

<u>Insurance Type</u>	<u>Amount</u>
Workers Compensation	An amount and type in full compliance with statutory requirements of Federal and State of Missouri law and Employees Liability coverage.
Comprehensive General Liability	\$1,000,000 each occurrence \$2,735,000 aggregate
Comprehensive Auto Liability	\$1,000,000 per occurrence

11.02 Property (Builder's Risk) Insurance

11.02.1 Unless otherwise provided, the Contractor shall purchase and maintain property insurance (Builder's Risk Insurance) upon the entire Work at the site to the full insurable value thereof. This insurance shall include the interests of the City, the Contractor, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of Fire, Extended Coverage, Vandalism and Malicious Mischief.

11.02.2 The Contractor shall purchase and maintain such steam boiler and machinery insurance as may be required by the Contract Documents or by law. This insurance shall include the interests of the City, the Contractor, Subcontractors and Sub-subcontractors in the Work.

11.02.3 Certificate(s) of Insurance acceptable to the City shall be filed with the City prior to commencement of the Work. Certificate(s) of Insurance must state on the Certificate: "The City of Wentzville, Missouri is an additional insured." These Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least 30 days prior written notice has been given to the City.

11.02.4 Any loss insured by property insurance maintained by the City shall be adjusted with the City and made payable to the City as trustee for the insured, as their interests may appear, subject to the requirements of any applicable mortgagee clause.

11.02.5 The City and Contractor waive all rights against each other for damages caused by fire or other perils to the extent covered by insurance provided under this Paragraph 11.02 and the Contract Documents, City-Contractor Agreement, except such rights as they may have to the proceeds of such insurance held by the City as trustee. The Contractor shall require similar waivers by Subcontractors and Sub-subcontractors in accordance with Section 5.02 hereof.

SECTION 12 BOND REQUIREMENTS

12.01 Bid Bond

If the total project bid exceeds \$50,000 a Bid Bond shall be included in the Bid Proposal and shall be to five percent (5%) of the bid value. The Bid Bond will be required for the total project bid.

12.02 Performance Bond:

If the Contract Sum is in excess of \$50,000 the Contractor shall procure and maintain a performance bond (the "Bond") for the benefit of the City of Wentzville ("City") as required by the laws of the State of Missouri and in an amount not less than 100% percent of the aggregate amount of the Contract. The Bond shall serve as security for the faithful performance of this Contract.

12.03 Payment Bond

If the Contract Sum is in excess of \$50,000, the Contractor shall procure and maintain a payment bond (the "Bond") as required by the laws of the State of Missouri and in an amount not less than 100% percent of the aggregate amount of the Contract. The Bond shall serve to ensure the payment of all persons performing labor and furnishing materials in connection with this Contract. The Payment Bond shall meet all requirements of Section 107.170 RSMo.

12.04 Maintenance Bond:

The Contractor shall procure and maintain a Maintenance Bond in the amount of 10% of the final Contract Sum after any and all Change Orders and/or formal contract amendments. The Maintenance Bond shall be in full force for a one (1) year guarantee period from the date of final acceptance. Final payment will not be made until the City receives the Maintenance Bond. The Bond shall serve to ensure required maintenance of the Project will be provided throughout the maintenance period.

12.05 Bond Premiums

The premiums on all the Bonds shall be paid by the Contractor. The Bond shall remain in full force and effect during the life of the Contract (Performance and Payment) and during the term of any warranty (Maintenance) as required by the specifications and shall be held by the City.

12.06 Additional Requirements and Compliance

12.06.1 The Contractor represents, warrants, and guarantees, and Contractor shall also furnish to City a certificate of authority or some other evidence as deemed appropriate by the City establishing that the Bond is from a surety that is: authorized to do business in the State of Missouri, authorized to become surety on the bonds or obligations of persons or corporations, solvent with paid-up capital of not less than the applicable amount provided by the laws of Missouri, and, if organized outside the State of Missouri, in compliance with all the provisions of Missouri law relating to insurance companies other than life insurance companies. If, at any time, City shall become dissatisfied with any surety or sureties, or if for any other reason the Bond shall cease to be adequate security for City, Contractor shall, within ten days after notice from the City, substitute an acceptable bond (the "Additional Bond") in form and sum and signed by other sureties as may be satisfactory to City. The premiums on the Additional Bond shall be paid by contractor. All requirements herein applicable to the bond shall also be applicable to the Additional Bond. No further partial payments to Contractor shall be deemed due, nor shall be made until the sureties on the Additional Bond shall have qualified.

12.06.2 Contractor shall furnish to City such Bond together with insurance or other documents required by the Contract. The current power of attorney for the persons who sign for any surety

company shall be attached to the Bond. The power of attorney shall be sealed and certified with the manual signature of an officer of the surety. A facsimile signature will not be accepted.

12.06.3 The failure of the Contractor to supply the required Bond along with the evidence of the required insurance coverage and other documents required by the Contractor within ten days after the executed acceptance is received by the Contractor, or within such extended period as may be granted by the City, the City may grant, based upon reasons determined sufficient by the City, shall constitute a default and the City may either award the contract to the next responsive bidder or re-advertise for bids, and may charge against the Contractor the difference between the amount of his/her bid and the amount for which a contract for the work is subsequently executed. If a more-favorable bid is received by re-advertising, the defaulting Contractor shall have no claim against City for a refund. Because of the difficulty of ascertaining the damages caused to City, said sum shall be considered liquidated damages and shall not constitute a penalty.

12.06.4 The Contractor shall supply the following documents to verify the authenticity of the bonds and bonding company:

12.06.4.1 Provide a certificate of authority from the Secretary of State of Missouri concerning the authority of the bonding company.

12.06.4.2 Provide proof that the bonding company has an "A" rating from BEST'S or Standard and Poor's.

12.06.4.3 Provide written verification from the bonding company that the bond exists and that it is an obligation of the contractor.

SECTION 13 CHANGES IN WORK

13.01 Change Orders

13.01.1 The City, without invalidating the Contract, may order Changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, with the Contract Sum and the Construction Schedule being adjusted in accordance with the City-Contractor Agreement. All such changes in the Work shall be authorized by Change Order, and shall be executed under the applicable conditions of the Contract Documents.

13.01.2 The Contract Sum and the Contract Time may be changed only by Change Order. The Contractor shall make all requests for a Change Order on forms provided by the City upon written request to the City.

13.01.3 The cost or credit to the City resulting from a Change in the Work shall be determined in accordance with the City-Contractor Agreement.

13.01.4 Changes in the Work outside of the general scope of the Contract shall require an amendment to the Contract.

13.02 Claims for Additional Cost

If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the City written notice thereof within twenty (20) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor and approval granted by the City before proceeding to execute the Work. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

13.03 Minor Changes in the Work

The City shall have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or the Construction Schedule and not inconsistent with the intent of the Contract Documents. Such changes may be effected by Field Order or by other written order. Such changes shall be binding on the City and the Contractor.

13.04 Changes in Excavation Work

During construction, it may become necessary to increase the amount of excavation or to utilize a soil stabilization process if unsuitable subgrade conditions are found. The Contractor shall immediately contact the City if this condition occurs. The City and the Contractor shall agree upon the existence of unsuitable subgrade, the depth in which to remove the unsuitable soil, and the extent of the problem area prior to any additional work. No payment will be made for any area which undergoes additional excavation which is not indicated in the above scope of work and has not been approved by the City prior to the excavation. If provided in the Contract Documents, all additional excavation which becomes necessary shall be paid at the unit bid price for such work. The City reserves the right to contract with a separate contractor for the use of a soil stabilization process. No direct payment will be made for delays incurred due to this process and the Contractor's only compensation will be the allotment of additional days for the delay. The number of days shall be from the time the Contractor initially notifies the City of an unsuitable subgrade condition and until two days after the completion of the soil stabilization process.

13.05 Overhead and Profit from Changes in the Work

The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:

13.05.1 For the Contractor, for Work performed by the Contractor's own forces, ten (10) percent of the cost.

13.05.2 For the Contractor, for Work performed by the Contractor's Subcontractors, five (5) percent of the amount due the Subcontractors.

13.05.3 For the Subcontractor involved, for Work performed by that Subcontractors own forces, ten (10) percent of the cost.

13.05.4 For each Subcontractor involved, for Work performed by the Subcontractor's Sub-subcontractors, five (5) percent of the amount due the Sub-subcontractor.

13.05.5 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by an complete itemization of costs including labor, materials and Subcontracts. Where major cost items are Subcontracts, they shall be itemized also.

13.06 Altered Quantities

13.06.1 The City reserves the right to make changes in plan details which may vary the accepted quantities from those shown on the Bid Form.

13.06.2 The Contractor shall accept, as payment in full, payment at the original Contract unit prices bid for the accepted quantities of work done. No allowance will be made for any increase expense or loss of expected profit suffered by the Contractor resulting directly from such altered quantities or indirectly from expense derived by handling small quantities of materials or performing operations within restricted areas. No allowance shall be made for any increased expense or loss of expected profit suffered because of the anticipated use of specific equipment which was not used.

SECTION 14 UNCOVERING AND CORRECTION OF WORK

14.01 Uncovering of Work

14.01.1 If any Work should be covered contrary to the request of the City, it must, if required by the City, be uncovered for his observation and replaced, at the Contractor's expense.

14.01.2 If any Work has been covered which the City has not specifically requested to observe prior to being covered, the City may request to see such Work and it shall be uncovered by the Contractor. If such Work is found to be in accordance with the Contract Documents, the Cost of uncovering and replacement shall, by appropriate Change Order, be charged to the City. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay the costs of uncovering and replacement.

14.02 Correction of Work

14.02.1 The Contractor shall promptly correct all Work rejected by the City as defective or as failing to conform to the Contract Documents, whether observed before or after substantial completion of the Work, and whether or not fabricated, installed or completed. The Contractor shall bear all cost of correcting such rejected Work.

14.02.2 If, within one year after the date of substantial completion or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any of the Work is found by the City to be defective or not in accordance with the Contract Documents, the Contractor shall correct it within 5 days after receipt of a written notice from the City. If the Contractor does not correct such deficiencies within that time, the City shall be entitled to specific performance from a court of equity or money damages in the amount of the reasonable cost of repairs, if adequate, provide that nothing shall limit the City's ability to draw upon the Performance and Maintenance Bond to correct such deficiencies. In all situations in which the City is forced to enforce the terms or specifications of the contract documents, the City shall be entitled to its reasonable attorneys' fees for enforcement of any provision of the contract documents.

14.02.3 All such defective or non-conforming Work under Subparagraphs 14.2.1 and 14.2.2 shall be removed from the site if necessary, and the Work shall be corrected to comply with the Contract Documents without additional cost to the City.

14.02.4 The Contractor shall bear the cost of making good all work of separate contractors destroyed or damaged by such removal or correction.

14.02.5 In the alternative to Section 14.02.3, if the Contractor fails to correct such defective or non-conforming Work, the City may correct it in accordance with Section 3.03 hereof.

14.03 Acceptance of Defective or Non-Conforming Work

14.03.1 If the City prefers to accept defective or non-conforming Work, it may do so instead of requiring removal and correction, in which case a Change Order will be issued to reflect an appropriate reduction in the Contract sum, or if the amount is determined after final payment, it shall be paid by the Contractor.

SECTION 15 PURCHASE OF MATERIALS AND EQUIPMENT

15.01 Sales Tax Provisions

This project is exempt from all sales taxes for construction materials and supplies used directly in fulfilling contract requirements. Sales tax shall not be included in the unit costs for this project. The Contractor shall follow the regulation as outlined in RSMo 144.062.1.

The City will issue the Contractor a project exempt certificate which is to be given to the applicable suppliers and used only for the specific project identified and will expire on the date indicated unless renewed by the City.

15.01.1 Contractor shall:

15.01.1.1 Order all necessary materials and equipment to complete the Work and the Project in accordance with the Plans and Specifications.

15.01.1.2 Inspect all delivered materials for conformance to specifications, damage, or breakage and subsequently accept materials if found to be satisfactory.

15.01.1.2.1 Purchase of materials on behalf of the City shall not relieve the Contractor of obligations to order, schedule deliveries, inspect, accept, or reject, store, handle or install materials or perform any other duties required by the Contract Documents or customarily performed in conjunction with providing materials to complete the Work.

15.01.1.2.2 Costs of complying with the foregoing Special Sales Tax Provisions shall be included in the Bid Proposal submitted and the Contractor shall not be entitled to receive additional compensation for such compliance.

15.02 Use of American Made Products.

Any manufactured goods or commodities used or supplied in the performance of the Contract Documents or any subcontract thereto shall be manufactured or produced in the United States as required and in accordance with Section 34.353 RSMo.

15.02.1 This section shall not apply when:

15.02.1.1 The purchase, lease, or contract involves an expenditure of less than twenty-five thousand dollars;

15.02.1.2 Only one line of a particular good or product is manufactured or produced in the United States;

15.02.1.3 The specified products are not manufactured or produced in the United States in sufficient quantities to meet the City's requirements or cannot be manufactured or produced in the United States within the necessary time in sufficient quantities to meet the City's requirements;

15.02.1.4 Obtaining the specified products manufactured or produced in the United States would increase the cost of the contract by more than ten percent.

15.02.2 If the goods or commodities are not exempt due to a circumstance described in Section 15.02.1, then the Contractor shall provide the City with the information necessary to make the certifications required under Section 34.353 RSMo.

15.03 Missouri Products

Contractors are encouraged to purchase commodities and tangible property manufactured, produced, or grown within the local area and in the State of Missouri, and from all firms, corporations, or individuals with licensed businesses in the State of Missouri.

SECTION 16 SPECIAL PROVISIONS

16.01 Scheduling of Work and Interference with Traffic

16.01.1 The Contractor's work must be scheduled and accomplished in stages such that local traffic is maintained during construction. It shall be the Contractor's responsibility to provide a traffic way that is usable in all weather conditions. The Contractor shall construct and maintain in a safe condition temporary pavements and connections for local traffic.

16.01.2 Suitable temporary barriers shall be provided to protect traffic from the Work if necessary. At all times until final acceptance of the Work, the Contractor shall provide and maintain such signs, lights, barriers, cones, watchmen or flaggers as may be necessary to properly protect the Work and provide for safe and convenient public travel. In the case of open excavations or other potentially hazardous conditions existing during non-working periods, the traveling public will be protected and advised by signs and flasher barricades. Parking of equipment or storage of materials on or near the Project site will be permitted only if adequate protective devices are provided and then only for the minimum time required for any specific job.

16.01.3 No additional payment shall be made for temporary guardrail, barriers, signs, lights, or other work as may be necessary to maintain traffic and to protect the Work and the public and all labor, equipment and material necessary to accomplish this task shall be considered incidental.

16.02 Access

16.02.1 Areas of intersections and roadways within the construction limits shall be constructed in phases so that at no time will access be denied.

16.02.2 Access to private driveways may be limited by the nature of the Work. The Contractor shall schedule his work such that at no time during the life of this Contract will any driveway be denied access for any reason other than the curing of concrete. All concrete, including curbs, sidewalks and driveway pavements, shall be formed and poured within a two calendar day period for each and every driveway. Excavation for this work shall be accomplished a maximum of one calendar day prior to forming, however, access shall be provided immediately after excavation. At the end of the curing period, access shall be immediately supplied using asphalt or compacted aggregate.

16.02.3 All temporary materials used for access will be the responsibility of the Contractor and shall be included in his unit bid price for each related item. No separate payment will be made for the placement, maintenance or removal of said access.

16.02.4 If said access is not supplied as set out above, the City will supply said access with its own forces, without notification to the Contractor, and will deduct such costs from the sums due the Contractor, notwithstanding any other provisions given this Contract. Wherever excavation affects pedestrian access to houses or public buildings, plank or other suitable bridges shall be placed at convenient intervals.

16.03 Construction Staking and Layout

The Contractor shall be responsible for providing all labor, equipment and materials necessary for construction staking and layout as required, to the grades, elevations and alignment as determined by the City. No separate payment will be made for construction staking and layout. The Contractor shall make his bid accordingly. No payment shall be made for restaking except as expressly authorized due to changes made by the City during construction.

16.04 Pre-Construction Conference

A preconstruction conference may be held prior to the issuance of a notice to proceed with the Work. This meeting will be attended by the Contractor, the City, and representatives of the various utility companies that have facilities in the project area. The meeting date will be established after the taking of bids and at a time convenient to all parties.

16.05 Sequence of Work

16.05.1 A schedule of the Contractor's work shall be submitted to the City for approval. It shall contain a listing of the order in which the Contract items will be constructed and the approximate dates for starting and finishing each Contract item.

16.05.2 The Contractor shall furnish the City his proposed sequence and schedule for the completion of all work for its review and approval prior to the time of the preconstruction conference. The City shall have the right to specify the order of construction as deemed necessary.

16.05.3 The Contractor shall update and provide the City the revised schedule as necessary.

16.06 Control of Materials

16.06.1 The Contractor shall collect all materials tickets to verify the quantity of each item. Material tickets shall be collected and provided to the City in their original form. Photocopy or fax copies will not be accepted. All tickets shall be submitted on the day of delivery, either to the City personnel or the Public Works Department, or they shall not be accepted for payment.

16.06.2 Contractors and subcontractors shall produce letters of certification or certified test reports from materials producers and suppliers in order to determine compliance with specifications for designated materials prior to the incorporation thereof into the work.

16.06.3 The City will determine which materials are to be tested. The form and content of these test reports shall be in accordance with recognized standards and practices for this work or as otherwise determined by the City.

16.07 Termination by the Owner for Cause

16.07.1 In addition to all other remedies available to the Owner, the Owner may terminate the Contract if the Contractor:

16.07.1.1 Refuses or fails to supply enough properly skilled workers or proper materials;

16.07.1.2 Fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

16.07.1.3 Disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

16.07.1.4 Otherwise is guilty of substantial breach of a provision of the Contract Documents.

16.07.2 When any of the above reasons exists, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if

any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior right of the surety:

16.07.2.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

16.07.2.2 Accept assignment of subcontracts; and

16.07.2.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

16.07.3 When the Owner terminates the Contract for cause, the Contractor shall not be entitled to receive further payment until the Work is finished.

16.07.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for professional services (including architects and engineers) and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the project architect, upon application, and this obligation for payment shall survive termination of the Contract.

16.08 Termination by the Owner for Convenience

16.08.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

16.08.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

16.08.2.1 Cease operations as directed by the Owner in the notice;

16.08.2.2 Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

16.08.2.3 Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

16.08.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and actual costs incurred by reason of such termination.



JOB SPECIFIC PROVISIONS

JSP-1 – Additional Testing

Description. In addition to the testing requirements as outlined in the Standard Specifications, the Contractor shall procure a temporary portable generator on site, to test the installed transfer switch. The public works facility shall be temporarily operated for a period of 2 hours using the temporary generator. While operating the public works facility with the temporary generator, the loads shall be varied to test the operations under minimum, normal operation, and full operational loads. Based on JSP-2, the Contractor shall determine the appropriate size generator for temporary operation.

Method of Measurement. Additional Testing will not be measured.

Basis of payment. No direct payment will be made for Additional Testing and shall be considered incidental to the Work.

JSP-2 – Load Verification

Description. Prior to purchase or submittal of any materials, the Contractor shall verify the loads present under minimal, normal operation, and full operational conditions. The Contractor shall use the loading information to verify the rating of all materials to be purchased or supplied as part of the project.

Method of Measurement. Load Verification will not be measured.

Basis of payment. No direct payment will be made for Load Verification and shall be considered incidental to the Work.

**Public Works Transfer Switch
Installation Specifications**

DIVISION 16 – ELECTRICAL

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE NUMBER</u>
16010	General Electrical Requirements	16010-1 - 16010-5
16060	Electrical Demolition	16060-1 - 16060-3
16111	Conduit and Raceway	16111-1 - 16111-9
16123	Building Wire and Cable	16123-1 - 16123-6
16160	Cabinets and Enclosures	16160-1 - 16160-4
16170	Grounding and Bonding	16170-1 - 16170-9
16190	Supporting Devices	16190-1 - 16190-2
16195	Electrical Identification	16195-1 - 16195-4
16422	Temporary Power	16422-1 - 16422-2
16441	Enclosed Switches	16441-1 - 16441-3
16470	Panelboards	16470-1 - 16470-4
16671	Surge Protective Devices	16671-1 - 16671-7
16950	Testing Electrical Systems	16950-1 - 16950-3

DIVISION 16 – ELECTRICAL
Section 16010 – General Electric Requirements

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Work included in this section is general in nature and applicable to electrical system work. Contractor is also directed to other sections of Division 16 – Electrical for additional related specifications for items described in this section.
- B. Work included in this section shall apply to installation and testing of all materials and equipment necessary to completely install electrical system as shown on drawings and as described herein in these specifications, or as may be necessary for a complete and operational electrical system.
- C. Unless otherwise noted, all electrical equipment shown on project drawings shall be furnished under Division 16.
- D. Drawings pertaining to this installation indicate general location of conduits, wiring, distribution and motor control centers, lighting and outlets, and other details necessary for installation of system.
- E. Electrical installation as shown on drawings and as specified herein is based upon best available information, with regard to characteristics of mechanical equipment specified. In the event changes are necessary in order to accommodate mechanical equipment furnished, necessary revisions will be made with approval of Owner's representative.
- F. Any minor changes in location of equipment, to include conduits, outlets, etc., from those shown on drawings, shall be made without extra charge if so directed by Owner's representative. These changes shall be any changes in location that, had new location been the bid-upon location, would not have resulted in an increase in contract construction cost over that actually bid.
- G. All electrical equipment shall be installed in conformance with applicable sections of NFPA 70 – National Electrical Code, respective equipment manufacturer's directions, as detailed on drawings and as specified herein. Any installations which void U.L. listing (or other third party listing) and/or manufacturer's warranty of a device or equipment shall NOT be permitted.
- H. RELATED CONTRACT WORK DESCRIBED ELSEWHERE IN THESE SPECIFICATIONS:

Electrical Contractor shall note that it is **not** the intent of these Division 16 specifications herein to be all-inclusive of electrically related work to be performed as part of this contract.

Contractor shall also comply with electrical requirements in these sections of the specifications, including, but not limited to, wiring of motors, control panels furnished by others, HVAC equipment and all other electrically powered equipment furnished by others under this project.

1.02 LAWS AND ORDINANCES

- A. In installation of this work, Contractor shall comply in every respect with requirements of National Electrical Code (NEC), National Board of Fire Underwriters, and any state and local requirements, laws and ordinances as may be applicable.
- B. If, in opinion of the Contractor, there is anything in drawings or specifications that will not strictly comply with above laws, ordinances and rules, the matter shall be referred to the attention of the Owner's representative for a decision before proceeding with that part of the work. No changes on drawings or in specifications shall be made without the full consent of Owner's representative.
- C. Contractor shall obtain and pay for all licenses, permits and inspections required by above laws, ordinances and rules for entire electric wiring job called for in these specifications and accompanying drawings.

1.03 DRAWINGS

- A. Drawings for electrical work will be a part of electrical drawings to which will be added, during the period of construction, any other detail drawings as may be necessary in opinion of Owner's representative, to show proper installation of various appliances or equipment with relation to project.
- B. Drawings and specifications are intended to be descriptive only, and any error or omissions of detail in either **shall not** relieve Contractor from obligations thereunder to install in correct detail any and all materials necessary for complete and operating electrical systems to extent shown on drawings and described in this specification.
- C. Contractor shall, during progress of job, record any and all changes or deviations from original drawings, and, at completion of project, shall deliver to Owner's representative a **single** marked-up set of "as-built" drawings.

1.04 SHOP AND ERECTION DRAWINGS

- A. This Contractor shall prepare shop drawings for all parts of his work. Before commencing any work or providing any material, Contractor shall submit for approval of Owner's representative all drawings relating to construction, arrangement or disposition of equipment entering into contract, and show complete equipment with manufacturer's specifications of same.
- B. Shop drawings of all distribution and motor control centers, panels, power and lighting systems, fixtures, wire, cables, devices, etc. shall be submitted for approval, as well as complete details of all systems not shown in detail on drawings.
- C. SHOP DRAWINGS SHALL BE FULLY DESCRIPTIVE OF ALL MATERIALS AND EQUIPMENT TO BE INCORPORATED INTO THIS PROJECT. CONTRACTOR SHALL CAREFULLY CHECK ALL SUBMITTED SHOP DRAWINGS, MAKING SURE THEY ARE COMPLETE IN ALL DETAILS AND COVER SPECIFIC ITEMS AS HEREINAFTER SPECIFIED.

- D. Shop drawings shall be submitted in sufficient quantity as required by the General Conditions. Three (3) copies will be retained by the Engineer for his use and records.
- E. No material or equipment shall be allowed at the site until shop drawings approved by the Engineer are received by the Resident Engineer at the site.
- F. The following information shall be clearly marked on each shop drawing, catalog cut, pamphlet, specifications sheet, etc. submitted:

PROJECT TITLE:

BRANCH OF WORK: ELECTRICAL

NAME OF BUILDING OR LOCATION:

PAGE OF DRAWINGS OR SPECS WITH WHICH EQUIPMENT COMPLIES:

DATE:

SUBMITTED BY:

PART 2 PRODUCTS

2.01 PRODUCTS SHALL BE AS SPECIFIED IN OTHER SECTION AND AS DETAILED ON THE DRAWINGS.

PART 3 EXECUTION

3.01 EQUIPMENT STORAGE

- A. Except as indicated below, **all** electrical equipment considered to be a part of this contract shall be stored before installation in a warm, dry, **indoor area** so as to protect the equipment from physical damage, freezing, dirt and any other harmful effects.
- B. The following electrical equipment shall be permitted to be stored outdoors on pallets or without direct contact with the earth, under tarpaulins or plastic covers:
 - 1. Conduit. Does not include boxed fittings, etc., which shall be stored indoors.
 - 2. Cable Tray. Does not include boxed hardware, which shall be stored indoors.
 - 3. Ground Rods.
 - 4. Wire and Cable.
 - 5. Rebar.
 - 6. Strut-type framing members. Does not include boxed hardware, which shall be stored indoors.
 - 7. Exterior pad mount transformers.
 - 8. Exterior Pad-Mounted Med. Voltage Switchgear.
 - 9. Other electrical equipment not listed herein, with written approval of the Owner's Authorized Representative.
- C. The following electrical equipment shall be permitted to be stored exposed outdoors on pallets or without direct contact with the earth:

1. Light Poles. Does not include light fixtures or boxed hardware, which shall be stored indoors.
 2. Other electrical equipment not listed herein, with written approval of the Owner's Authorized Representative.
- D. The installation of electrical equipment shall not be begun until the structure, if required, within which the equipment is to be permanently housed, is complete enough to provide protection from weather and vandalism (i.e. roof, windows and temporary padlockable or permanent doors installed).
- E. The Contractor will be responsible for ensuring conformance with these procedures.

3.02 EQUIPMENT MOUNTING

- A. All equipment and materials shall be installed and completed in a first-class workmanlike manner. The right is reserved to direct the removal and replacement of any item, which in the opinion of the Owner's Representative and/or Architect/Engineer does not present an orderly and reasonably neat or workmanlike appearance, provided such items can be properly installed in an orderly way by usual methods in such work.
- B. The approximate location of all equipment and devices is shown on the Drawings. The Owner's Representative and/or Architect/Engineer reserves the right to change the location of all equipment or devices 6 ft in any direction at no additional cost provided such changes are requested before final installation.
- C. Install all equipment with ample space allowed for removal and repair. Provide ready accessibility to removable parts of equipment and to all wiring without moving equipment which is installed or which is already in place. Provide access panels for all devices installed above non-accessible ceilings and/or within walls or partitions.
- D. Install electrical equipment with due consideration to ventilating ducts, HV AC equipment, mechanical piping, etc., adjusting locations as necessary.
- E. Electrical equipment shall be installed to maintain minimum clearances per Article 110 of NEC and ANSI C2 (National Electrical Safety Code.)
- F. Electrical Contractor shall be responsible for furnishing and setting all anchor bolts required to install Electrical Contractor's equipment.
- G. Where concrete mounting pads are required for electrical equipment mounting, Electrical Contractor shall furnish all concrete and formwork necessary to complete the installation.
- H. Where electrical equipment is located on damp or wet walls or locations as directed, it shall be "stand-off" mounted a minimum of ½" from wall in a manner so that rear of equipment is freely exposed to surrounding air. Method of mounting shall be approved by Owner's representative before equipment is mounted.
- I. Unless otherwise noted, top of safety-switches, control panels, and similar equipment shall be 5'-0" above finish floor or finish grade.

- J. Enclosures for panelboards, switches or overcurrent devices shall not be used as junction boxes, auxiliary gutters or raceways for conductors feeding through or tapping-off to other switches or overcurrent devices, unless adequate space for this purpose is provided and the equipment is listed for this use.
- K. In order to maintain NEC ratings and classifications of cables, do not combine conduit contents or modify conduit materials of construction unless specifically directed or shown otherwise on project documents.
- L. Per NEC 300.11(A)(2), when independent electrical equipment support wires are installed within dropped-ceiling areas, they shall be distinguished by color, tagging, or other permanent effective means.

3.03 COORDINATION

- A. Provide day-to-day coordination with the work of other contractors engaged in this project. Execute the work in a manner not to interfere with other Contractors, and vice-versa.
- B. Coordinate with other contractors regarding the location and size of pipes, raceways, ducts, openings, devices, so that there may be no interferences between installation or of the progress of any contractor.
- C. Coordinate installation of equipment and wiring with the established construction schedule.
- D. Provide temporary platforms and hand rails as required, to allow installation of electrical components and raceway systems.

3.04 PROTECTION OF WORK

- A. Protect work from injury by keeping all conduit and boxes capped and plugged or otherwise protected. This includes damage by freezing and/or stoppage from building materials, sand, dirt, or concrete.
- B. Protect all equipment and fixtures from damages during the project, provide all tarpaulins, drop cloths, barricades, temporary heaters or auxiliary equipment.
- C. All materials or equipment damaged during construction shall be repaired or replaced with new items to the satisfaction of the Architect/Engineer.

END OF SECTION 16010

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Electrical demolition.

1.02 RELATED WORK (RESERVED)

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT (RESERVED)

PART 3 EXECUTION

3.01 EXAMINATION

- A. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED AND NOT TO INDICATE EVERY BOX, CONDUIT, OR WIRE THAT MUST BE REMOVED.
- B. Where walls, ceilings, etc., are indicated as being removed on general plans, the Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, wiring, systems, etc., from the removed area.
- C. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others, this Contractor shall be responsible for the removal, storage, and replacement of equipment, devices, fixtures, raceways, wiring, systems, etc.
- D. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit, wire and equipment to facilities or equipment which shall remain in operation following demolition. Extension of conduit wire equipment shall be compatible with surrounding area.
- E. Coordinate scope of work with all other Contractors and the Owner's representative at the project site. Schedule removal of equipment and electrical service to avoid conflicts.
- F. Bid submittal means Contractor has visited the project site and has verified existing conditions and scope of work.
- G. Prior to beginning any work, the Contractor shall field determine all existing circuits and equipment powered by these circuits in the areas of demolition.

3.02 PREPARATION

- A. Disconnect electrical systems scheduled for removal.
- B. Coordinate utility service outages with the Owner's representative.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work as outlined in the plans.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
- C. Where possible, remove abandoned wiring and raceway to source of supply. Abandoned conduits which extend to below grade shall be removed to minimum of 1'-0" below grade and capped to prevent entry of water.
- D. Remove exposed abandoned raceway. Cut raceway flush with walls and floors, and patch surfaces. Remove all associated lamps, hangers, supports, etc. associated with raceway removal.
- E. Disconnect abandoned outlets and toggle switches and remove devices. Remove abandoned outlets and toggle switches if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlet boxes which are not removed.
- F. Disconnect and remove abandoned panelboards and distribution equipment.
- G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories. Place existing fluorescent ballasts in E.P.A. approved containers for P.C.B.'s and dispose of them in an E.P.A. approved landfill. Provide documentation that P.C.B. disposal requirements have been met.
- I. Repair adjacent construction and finishes damaged during demolition and extension work.
- J. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CONTINUITY OF SERVICE DURING ELECTRICAL DEMOLITION

- A. Contractor shall maintain continuity of service to all existing electrical equipment to be removed or replaced until such equipment is no longer needed to maintain process operation at the facility. This may require temporary relocation of equipment to be removed, temporary wiring of equipment to be removed and temporary power generation using portable generators as required to maintain operation of critical process equipment at the facility.
- B. Contractor shall note that the proposed improvements under this contract shall occur at an existing facility that must remain in operation during the improvements. Construction sequencing to minimize power outages at the facility is mandatory.
- C. There shall be no power outages of any kind or duration whatsoever without the written consent of the owner's authorized representative. Failure to comply with this requirement could result in substantial penalty charges being assessed the contractor.
- D. With assistance and approval of the owner's authorized representative(s), the contractor shall develop a written electrical demolition sequence schedule as part of the overall Electrical Construction Sequence Schedule. No electrical work shall begin without this written construction sequence schedule.
- E. Prior to beginning of any work requiring a power outage of any kind or duration, the contractor shall have all labor, material and equipment on site and ready for use.
- F. Maximum duration of any single power outage, whether partial or complete, shall be four (4) hours - however this maximum duration shall only apply in low flow conditions and, again, only with the written approval of the owner's authorized representative.
- G. Whenever possible, the contractor shall coordinate the electrical power outages to coincide with relevant process interruptions schedules by other contractors and trades on this jobsite. This will minimize the number of process flow interruptions the facility must sustain.

END OF SECTION 16060

DIVISION 16 – ELECTRICAL
Section 16111 – Conduit and Raceway

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Work included in this section is conduits, raceways and fittings required for operation and maintenance of facility.

1.02 RELATED SECTIONS

- A. Section 16010 – General Electrical Requirements
- B. Section 16123 – Building Wire and Cable
- C. Section 16190 – Supporting Devices

1.03 REFERENCE TO STANDARDS

- A. Federal Specifications WW-C-581d
- B. Federal Specifications WW-C-540c
- C. Federal Specifications WC-1094-A
- D. ANSI C80.1
- E. ANSI C80.3
- F. ANSI C80.5
- G. UL Standard UL-6 Electrical Rigid Metal Conduit – Steel
- H. UL Standard UL-6A Electrical Rigid Metal Conduit – Aluminum, Red Brass and Stainless Steel
- I. UL Standard UL-651 Standard for Schedule 40, 80, Type EB and a Rigid PVC Conduit and Fittings.
- J. NEMA RN1
- K. NEMA RN2
- L. NFPA 70 (NEC)
- M. NEMA TC-2
- N. NEMA TC-3
- O. NEMA TC-7

1.04 DELIVERY, STORAGE AND HANDLING

- A. Conduits shall not be shipped loose, but shall be bundled by sizes. Threads of metal conduits shall be protected by plastic caps. Fittings shall be stored in

boxes. All equipment shall be stored on pallets to prevent contact with earth and shall be covered with plastic sheeting to protect them from dirt and weather.

1.05 SUBMITTALS (SUBMIT ONLY ON TYPES APPLICABLE FOR PROJECT)

- A. Submit under provisions of Division 1.
- B. Schedule 40 Galvanized Rigid Steel Conduit
- C. PVC Coated Galvanized Rigid Steel Conduit
- D. Schedule 40 Aluminum Rigid Conduit
- E. Electrical Metallic Tubing (EMT)
- F. Rigid PVC Conduit
- G. Flexible Metal Conduit
- H. Liquid Tight Flexible Metal Conduit
- I. Explosion-proof Flexible Metal Couplings
- J. Fittings and Conduit Bodies
- K. Expansion/Deflection Fittings
- L. Lay-In Wireway
- M. Conduit Seals
 - 1. Conduit Fire Stopping
 - 2. Conduit Water Seals
 - 3. Conduit Explosion Proof Seals

1.06 QUALIFICATIONS

- A. All materials shall be purchased new from suppliers/manufacturers regularly engaged in the business of electrical conduit, ducts and fittings.

1.07 MAINTENANCE SERVICE (WARRANTY)

- A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by Owner.

PART 2 PRODUCTS

2.01 EQUIPMENT SPECIFICATION

Note that all types specified below may not be used on every project. Refer to project drawings for individual project requirements.

- A. Schedule 40 Galvanized Rigid Steel Conduit:

Conduits shall be of heavy wall type fabricated from mild steel tubing and shall have a hot-dipped galvanized inner and outer coating, with a final coating of zinc chromate. Conduit and installation shall comply with all requirements in NEC Article 344. Mounting hardware shall be corrosion resistant, stainless steel, or galvanized steel.

B. PVC Coated Galvanized Rigid Steel Conduit:

PVC coated galvanized rigid steel conduit shall be Robroy Industries Plasti-Bond, or equivalent. PVC coating shall be a minimum of 40 mils in thickness and permanently fused to hot-dipped galvanized rigid steel conduit. A urethane inner coating shall be applied to the conduit interior and a clear urethane coating shall be applied over the galvanized threads. Conduit and installation shall comply with all requirements in NEC Article 344. Mounting hardware shall be corrosion resistant: PVC coated supporting devices with stainless steel hardware.

C. Schedule 40 Rigid Aluminum Conduit

Conduit shall be of 6063 aluminum alloy, T-1 temper (Former designation T-42). Rigid aluminum conduit shall be third-party listed for use in classified (hazardous) locations. Conduit and installation shall comply with all requirements in NEC Article 344. Do not utilize steel or iron conduit fittings with aluminum conduit. Mounting hardware shall be corrosion resistant: stainless steel or aluminum.

D. Electrical Metallic Tubing (EMT)

EMT shall be hot dip galvanized steel with an organic corrosion resistant coating and shall be produced in accordance with U.L. Standard 797, ANSI C80.3 and NEMA RN2. Fittings for EMT conduit shall be compression type only, set-screw type fittings shall not be utilized. Conduit and installation shall comply with all requirements in NEC Article 358. Mounting hardware shall be corrosion resistant: zinc, galvanized steel, aluminum or stainless steel.

E. Rigid PVC Conduit:

Conduit shall be Schedule 40 or Schedule 80, as noted on the drawings, PVC, 90°C, UL rated or approved equivalent. Material shall comply to NEMA Specification TC-2 (Conduit), TC-3 (Fittings-UL-514), and UL-651 (Standard for rigid nonmetallic conduit). Conduit and fittings shall carry a UL label (on each 10 foot length of conduit and stamped or molded on every fitting). Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. Markings shall be legible and permanent. Conduits shall be made from polyvinyl chloride C-300 compound which includes inert modifiers to improve weatherability, heat distortion. Clean rework material, generated by manufacturer's own conduit production, may be used by same manufacturer, provided end products meet requirements of this specification. Conduit and fittings shall be homogeneous plastic material free from visible cracks, holes, or foreign inclusions. Conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or cables. Conduit, fittings and cement shall be compatible to assure system

integrity and shall be Carlon Plus 40 (Schedule 40) or Plus 80 (Schedule 80) as shown on project drawings, or equal. Conduit and installation shall comply with all requirements in NEC Article 352. Mounting hardware shall be corrosion resistant: nonmetallic support straps or PVC conduit clamps with stainless steel hardware, designed for the installation of PVC conduit, which allows the conduit to expand and contract freely over varying temperature changes.

F. Flexible Metal Conduit

Flexible metal conduit (Greenfield) shall consist of interlocking steel armor and shall comply with U.L. Standard 1 and 1479. Conduit and installation shall comply with all requirements in NEC Article 348.

G. Liquid Tight Flexible Metal Conduit:

Liquid tight flexible metal conduit shall consist of polyvinyl jacket over flexible hot dip galvanized steel tubing. Flexible conduit shall be completely sealed from liquids, dust, dirt and fumes, be resistant to oil, gasoline, grease and abrasion. Jacket shall also be sunlight resistant. Flexible conduit shall be U.L. listed and comply with Article 351 of NEC. Flexible conduit shall be Flexi-Guard Type UAG, as manufactured by O-Z/Gedney, or equal. Conduit and installation shall comply with all requirements in NEC Article 350.

H. Liquid Tight Flexible Non-Metallic Conduit:

Liquidtight Flexible Non-Metallic Conduit shall be non-conductive, non-corrosive, resistant to oil, acid, ozone and alkaline, and crush, abrasion and strain resistant. Conduit shall maintain internal I.D. even in tight radius bends. Conduit shall be UL Listed for use as indicated in Article 356 of the NEC, UL Listed for outdoor use, and sunlight resistant. Trade sizes 1/2", 3/4" and 1" shall be UL Listed for direct bury. Conduit shall be suitable for use at conduit temperatures of 80°C dry, 60°C wet and 60°C oil resistant as required by section 15-6 of ANSI/NFPA 79-1985 and U L 1660. Liquidtight non-metallic flexible conduit shall be Carlon Carflex Type LFNC-B, or equivalent.

I. Fittings and Conduit Bodies:

Unless otherwise specified, all fittings and conduit bodies shall be manufactured from the same type of material as the conduit system (aluminum, galvanized steel, PVC, etc.) Field Modifications to Existing Rigid Metal Conduit Systems ONLY:

Where modifications to existing rigid conduit installations make threading of field cuts impossible, use Type HK series couplings by Thomas & Betts/Steel City, or equivalent.

J. Expansion and Deflection Fittings

Where noted on project drawings, or required by the nature of construction location, furnish conduit Expansion, Deflection or Expansion/Deflection Fittings. Expansion and deflection fittings shall be compatible with other conduit materials

and be type AX (expansion), DX (deflection) or AXDX (expansion/deflection) as manufactured by O-Z/Gedney, or equivalent.

K. Pull Cords

Each empty conduit shown or described on the drawings shall be furnished with a pull cord to facilitate future conductor installation. Cord shall consist of non-deteriorating, non-metallic, non-cotton construction such as polyester or nylon material. Minimum tensile strength of all pull strings shall be 200#. Leave minimum of 12 inches slack at each termination or end. Any references on project drawings to "pull wire" shall be interpreted as a pull cord as described herein.

2.02 SEALING

A. Fire Seal (Fire Stopping Material):

1. Fire stopping materials shall consist of commercially manufactured products capable of passing ASTM E-814 (UL 1479) Standard Method of Fire Test for Through Penetration Fire Stops.
2. Fire stopping materials shall maintain the rating of the wall, partition, ceiling or floor opening where penetration is made. Comply with NEC 300-21.
3. All fire-stopping materials shall be third-party classified.
4. Where sleeves are to be installed, the sleeve shall be heavy wall steel pipe sleeves, anchored to building construction and finished plumb with wall, ceiling, or floor lines.
5. Manufacturers:
 - a. Chase Technology – CTC, PR-855.
 - b. Dow Corning – Silicone RTV Foam 3-6548.
 - c. Nelson – Flameseal.
 - d. Thomas & Betts – Flame Safe.
 - e. 3M – Fire Barrier.
6. Where applicable for the respective wall and its fire rating, smoke and fire stop fittings may be used in lieu of sealant as manufactured by OZ/Gedney, Series CFS.

B. Thermal Seal:

1. Seal penetrations of thermally insulated equipment or rooms top prevent heat transfer.

C. Moisture Seal:

1. When electrical conduits are installed in sleeves, core-drilled holes or box outs, seal between conduit and penetration of perimeter walls, ceilings or floors to prevent entry of water.
2. Seal conduit penetrations of roof with flashings compatible with roof design and approved by Roofing System Manufacturer and Engineer.

3. Seal annular space between conductors and conduit wall of all conduit terminations where conduit enters a building from below grade in order to block moisture migration into electrical equipment. In addition seal conduits entering electrical equipment located either interior or exterior that once installed condensation is created in the electrical equipment due to the electrical system being connected to areas with a different temperature. Conduit moisture barrier material shall not harden and be compatible with both wire insulation and conduit materials. Installed products shall be easily removed for maintenance or modifications, regardless of the length of time material has been installed. Conduit moisture seal material shall be:
 - a. "Hydroblock" by WaterGuard Technology Products
16023 East Freeway
Channelview, Texas 77530-4365
Phone: (281) 862-0300
Fax: (281) 862-0314
 - b. American Polywater Corporation
Polywater Duct Sealant FST-250 Series
P.O. Box 53
Stillwater, MN 55082
Phone: (651) 430-2270
Fax: (651) 430-3634
 - c. O-Z/Gedney
Type DUX Water Sealing Compound

PART 3 EXECUTION

3.01 INSPECTION

- A. All conduits shall be inspected for proper fit and finish, for out-of-round and for proper thickness. All burrs and flashing shall be removed. Conduit and fittings shall be clean and free of obstructions.

3.02 INSTALLATION

- A. Unless otherwise shown on the project drawings, minimum conduit trade-size shall be 3/4". Larger sizes shall be installed where noted or where required by NEC.
- B. In general, no aluminum conduit shall be cast in concrete or in direct contact with earth. Where such contact is found necessary or where specifically noted on project drawings, either coat all aluminum contact surfaces with a protective bituminous coating (such as Carbolite Bitumastic 50 or 300M) or alternately substitute galvanized rigid steel conduit for the sections which are in contact with concrete or earth.
- C. Interior Conduit Applications:
 1. Above Grade or Floor:
EMT or Rigid aluminum type unless otherwise noted on the project

- drawings.
2. Below Grade or Floor:

Schedule 40 PVC or galvanized rigid steel at the Contractor's option. Where interior conduits exit from below floor or grade to above grade furnish conduit transition between types no more than 6" above finish floor.
- D. Exterior Conduit Applications
1. Above Grade:

Rigid aluminum type unless otherwise noted on the project drawings. Where conduits exit to above grade transition to conduit type shall be no more than 6" from penetration.
 2. Below Grade:
 - a. Concrete encased schedule 40 PVC with galvanized rigid steel conduit transitions from concrete encasement to minimum 6" above grade.
- E. Moisture Seal of Below-Grade Conduits
1. Seal annular space between conductors and conduit wall of all conduit terminations where conduit enters from below grade in order to block moisture migration into electrical equipment. Install product only after conductors have been installed, terminated and commissioned for service. Install moisture seal products per all manufacturers instructions and requirements.
- F. Conduit Sealing For Fireproofing
1. Sleeves:
 - a. Install rigid metallic sleeves where exposed raceways pass through floors, walls (except exterior walls below grade) and ceilings.
 - b. Sleeve Diameter: Size sleeves to accommodate their through penetrating items and allow a minimum of a one (1") inch void between the sleeve and the item of penetration.
 2. Seal openings in fire rated floors, ceilings and roofs:
 - a. Pack void with backing material and ends of the sleeve sealed with a minimum of one (1") inch of a listed fire-resistive silicone compound to a depth required to meet the fire rating of the structure penetrated.
 - b. Install firestopping to meet the requirements of ASTM E-814
 - c. Install product in accordance with the manufacturer's instructions.
- G. Conduit size and fill requirements shall comply with appropriate conduit fill tables in Annex C of NEC. It should be noted these are minimum requirements and larger conduit sizes or smaller fill requirements shall be used whenever specified or detailed on drawings.
- H. Flexible conduit shall be provided as a connection between each motor junction box (or any other piece of equipment subject to movement or vibration) and rigid

conduit system. Liquid-tight and explosion-proof flexible conduit shall not exceed 3' in length.

- I. Ream conduits only after threads are cut. Cut joints square to butt solidly into couplings. Where necessary to join two pieces of conduit and it is impossible to use standard coupling, use three piece conduit coupling. Use of running thread is prohibited. This applies to all rigid conduit installations, under ground or otherwise. In order to comply with NEC Article 300.6(A), all rigid steel conduit shall have field-cut threads re-coated using an electrically conductive, corrosion-resistant compound, Thomas & Betts/Shamrock "Kopr-Shield" (a product of Jet Lube, Inc.), or equivalent.
- J. Make all joints in underground conduit watertight with approved joint compound. Temporarily plug conduit openings to exclude water, concrete or any foreign materials during construction. Clean conduit runs before pulling in conductors.
- K. Hickey hand-bends will not be acceptable for conduits one inch (1") and larger.
- L. Use pre-manufactured factory elbows or bends fabricated with hydraulic bending machine. Field bending of all PVC conduits shall be accomplished with use of equipment approved by conduit manufacturer. Open flame bending equipment will not be acceptable. A run of conduit between outlet and outlet, between fitting and fitting or between outlet and fitting shall not contain more than the equivalent of four quarter turn bends (360°), including bends immediately at an outlet or fitting.
- M. At all conduit terminations furnish locknuts on both sides of enclosure plus an insulated bushing unless conduit termination is into a factory-threaded conduit opening or watertight (Myers-type) hub.
- N. All conduit terminations at NEMA 4 or 4X enclosures shall be made with watertight (Myers-type) hubs listed for the application.
- O. Do not run conduit below or adjacent to water piping, except where permitted by Owner's representative.
- P. Run exposed conduits parallel with walls and at right angles to building lines, not diagonally.
- Q. Support exposed PVC conduit runs on walls or ceiling every three feet (3') and support exposed rigid metal conduit runs on walls or ceiling every five feet (5') with stainless steel or PVC coated galvanized cast one hole straps, clamp backs and anchors. Provide lead shield insert anchors, with stainless steel round head machine screws, for concrete and brick construction. In wood construction, use stainless steel round head wood screws. Where steel members occur, drill and tap and use stainless steel round head machine screws.
- R. In brick construction, drill hole for insert near center of brick, not near edge or in mortar joint.
- S. Support two or more PVC exposed hanging parallel conduit runs every three feet (3') and support exposed rigid metal hanging parallel conduit runs every five feet (5') with trapeze hangers. Hanger assembly to consist of concrete inserts, threaded solid rod, washers, nuts and cross members nominally one and five-

eighths inch (1-5/8") by one and five-eighths inch (1-5/8") non-metallic framing, as specified in Section 16190 - Supporting Devices. Anchor each conduit individually to cross members of every other hanger with cast one hole straps, clamps backs and proper sized stainless steel or non-metallic machine bolts and nuts.

- T. Perforated metal strapping of any kind is prohibited. Provide expansion and deflection fittings in all conduits which pass through or over building expansion joints. All expansion and deflection fittings shall be designed for, and compatible with, the conduit types on which they are installed.
- U. Grounding Electrode Conductors shall be installed in non-metallic PVC conduit or bonded to both ends of metallic conduit to comply with NEC 250.64.
- V. PVC coated galvanized rigid steel conduit shall be installed per manufacturer's requirements, using tools specifically designed for installation of PVC coated galvanized rigid steel conduit. Any tools, hardware or installation methods which cause damage the PVC coating shall not be utilized. Do not install any material found damaged from shipping or handling. Any PVC coated conduit damaged during installation shall be immediately repaired to the satisfaction of the Owner's authorized representative using patching materials and methods per manufacturer's instructions. If, in the opinion of the Owner's authorized representative, PVC coated galvanized rigid steel conduit is damaged beyond repair, the damaged portion(s) shall be removed and replaced at the contractor's expense.

END OF SECTION 16111

DIVISION 16 – ELECTRICAL
Section 16123 – Building Wire and Cable

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Work included in this section is supply of wire and cable to provide a complete and operational electrical system.
- B. Any bid submitted to the Owner which contains cost adjustments for the current price of metals (copper and/or aluminum) will be rejected. Qualified bids in any form will not be considered.
- C. Unless otherwise specified or detailed on drawings, all wire and cable on this project shall be copper construction only.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements
- B. Section 16111 - Conduit and Raceway
- C. Section 16170 - Grounding and Bonding

1.03 REFERENCE TO STANDARDS

- A. ANSI/NFPA 70 - National Electrical Code
- B. U.L Standard No. 44 - Thermoset-Insulated Wires and Cables.
- C. IPCEA Publication No. S-66-524.
- D. Federal Specification J-C-30B
- E. ASTM Specification B-8.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Wire and cable shall be delivered on reels or coiled in boxes. Wire and cables shall be stored and handled to prevent damage to conductor and insulation.

1.05 SUBMITTAL REQUIREMENTS

- A. Contractor shall submit for all cable types and sizes used on this project.

1.06 QUALIFICATIONS

- A. Wire and cables shall be manufactured and supplied by a company regularly engaged in business of furnishing wire and cable. If required by Owner's representative, manufacturer shall submit a certification to a minimum experience of five years in manufacture of wire and cable.

1.07 MAINTENANCE SERVICE (WARRANTY)

- A. All equipment shall be warranted to be free from defects in material and workmanship for period of one year from date of substantial completion established by the Owner.

PART 2 PRODUCTS

1.08 EQUIPMENT SPECIFICATION

- A. RHW-2 / USE-2 WIRE

Cable shall be 600 Volt rated, sized as indicated on the drawings. Cable shall comply with Underwriters Laboratories Standard U.L. 44 (for Type RHW-2) and U.L. 854 (for Type USE-2) and shall pass the IEEE 383, 70,000 BTU/hr and VW-1 Flame Tests. Cable insulation shall be abrasion, moisture, heat and sunlight resistant black cross-linked polyethylene (XLP). Cables shall be rated for use at 90°C in both wet and dry locations and be suitable for use in conduit, underground service entrance cable and direct burial applications.

- B. THHN/THWN

Unless otherwise noted on the plans or specifications, all power wiring installed under this project shall be dual rated type THHN/THWN.

Cable shall be 600 Volt rated, sized as indicated on the drawings. Cable shall comply with Underwriters Laboratories Standard U.L. 83. Cables shall be rated 90°C in dry locations 75°C in wet locations.

- C. INSTRUMENTATION SHIELDED CABLE

(For use in Conduit)

Shielded instrumentation cable shall be used where required or shown on plans. Cable construction shall be #16 AWG tinned copper, polyethylene insulated, have #18 AWG stranded tinned copper drain wire and aluminum-polyester shield with 100% coverage. Overall jacket shall be polyvinyl Chloride (PVC). Cables shall be 60°C, 600 V rated and U.L. recognized.

1. 2-Conductor shielded instrumentation cable for use in conduit shall be Belden #8719, or equivalent.
2. 3-Conductor shielded instrumentation cable for use in conduit shall be Belden #8618, or equivalent.

2.02 COLOR CODING

- A. Color code conductor insulation for #10 AWG or smaller conductors. Color code conductors #8 AWG or larger with colored tape or colored insulation. Standard colors:

	240 V or		
120/240V	208/120V	480V	240/120V
1 Phase	3 Phase	3 Phase	3 Phase
<u>3W</u>	<u>3 or 4W</u>	<u>3 or 4W</u>	<u>4W,)</u>

Phase A	Black	Black	Brown	Black
Phase B	Red	Red	Orange	Orange (high leg)
Phase C	N/A	Blue	Yellow	Blue
Neutral	White	White	Gray	White
Ground	Green	Green	Green	Green

- B. Intrinsically safe wiring shall be light blue color insulation per ANSI/ISA RP12.6 and NEC 504 or per respective equipment manufacturer’s recommendations.
- C. Control wiring insulation color shall be red.
- D. 120 VAC control wiring from a separate source (for example, 120 V control wiring from a control panel that supplies a remote located starter) shall be with yellow color insulation.
- E. 24 VDC wiring shall be Blue for Positive and White with Blue Stripe for Negative.

2.03 WIRE PULLING LUBRICANT

- A. Pulling Lubricants shall be UL listed, water based, polymer solution. Lubricants containing waxes, soaps or combustible materials are not acceptable. Contractor shall verify the compatibility of the selected cable pulling lubricant and cable jacket materials proposed. Manufacturers/Lubricants shall be as follows, or equivalent:
 1. American Polywater - Polywater J
 2. Ideal Industries - ClearGlide
 3. American Colloid - Poly-X
 4. Buchanan - Quick Slip
 5. ARNCO – HydraLube

2.04 SPLICES AND JOINTS

- A. Splices and joints shall be as described below, or approved equivalent.
- B. Interior applications:
 1. #8 and smaller conductors:
 - a. Ideal “sing nut” type insulated connectors.
 - b. Scotchlok R, B, and Y type insulated connectors.
 2. #6 and larger conductors:
 - a. New construction: For straight line connections, use compression connector with rubber insulating cover or boot.
 - b. New construction: For “ Tee” cable taps, use compression connector with rubber insulating cover or boot.
 - c. Existing construction: For taps in cabinets, gutters and other close locations, use O-Z/Gedney type XW & XWC, XTP & XTPC or, PMX & PMXC, or equivalent.
- C. Exterior applications

Note that below grade splices in manholes, handholes and vaults **will not** be allowed on this project unless specifically shown on drawings. Conductors are to be pulled continuous end-to-end unless otherwise noted or directed by the Engineer in writing.

1. #8 and smaller conductors:
 - a. Twist-on connectors pre-filled with silicone-based sealant to protect against moisture and corrosion. Units shall be UL 486 D listed as weatherproof, waterproof and suitable for direct burial. Units shall be Ideal Industries "Underground" #64 or King Innovation "Dryconn King 6 Blue" Filled Waterproof Connectors, or equivalent.
2. #6 and larger conductors:
 - a. NSI/Polaris ISRW Series "Blue"
 - b. IlSCO Series USPA, DBK, SSK or PDSS

PART 3 EXECUTION

3.01 INSTALLATION (WIRE CONDUCTORS)

- A. Wire and cable shall be installed using accepted industry methods to prevent damage to conductors and insulation. Installation shall comply with all applicable sections of NEC regarding conduit fill.
- B. No splices shall be permitted in conduit bodies. All splices shall be made in junction boxes, control panels and cabinets provided for that purpose as detailed or required by need.
- C. Neatly train and lace wiring inside boxes, equipment and panelboards.
- D. Drawings are diagrammatic in showing circuitry routing between devices and equipment. Provide all phase conductors, neutrals, switched and unswitched legs, grounds, etc., as required for a complete and operational electrical system.
- E. All 120V circuits shall have individual neutral conductors. 120V circuits with "shared" neutral conductor shall not be permitted.
- F. Minimum wire size shall be #12 unless otherwise noted. Where protected by 15A fuses, control wiring may be #14 AWG.
- G. All conductors shall be continuous without splices except at locations approved for the purposes of splicing.
- H. All wire sizes shall be stranded except where specifically approved otherwise.
- I. Intrinsically safe wiring shall be separated from non-intrinsically safe wiring in compliance with Article 504 of the NEC and ANSI/ISA Standard RP12.6. Intrinsically safe wiring insulation color shall be blue.
- J. All circuits shall be labeled in compliance with Section 16195 - Electrical Identification.

- K. Pulling eyes on conductors or a basket weave grip shall be used for pulling cable. Woven wire cable grips shall be used to pull all single conductor cable where pulling eyes are not available. Preferred method for pulling conductors is factory-installed eyes attached to conductors. All sharp points and edges on the hardware attaching the pulling rope to the cables shall be taped to prevent snagging or damaging the raceway.
- L. When a cable grip or pulling eye is used for pulling, the area of the cable covered by the grip or seal plus 6 inches shall be cut off, and discarded when the pull is completed. When pulling loops are used, the entire loop shall be cut off and discarded when the pull is completed.
- M. A non-binding type of swivel, or swivel connection shall be inserted between the pulling rope and the cable pulling eye, grip or loop to prevent twisting under strain and allow for free rotation of the cable during pulling.
- N. The pulling tension of any cables shall not exceed the maximum tension recommended by the cable manufacturer. Pulling mechanisms of both the manual and power types shall have the rated capacity clearly marked on the equipment. Cable shall be installed using either hand-tension or by use of specially-designed "cable-tuggers". Any cable pulled through conduit using trucks, back-hoe's, earthmoving equipment or similar apparatus will be rejected and will be replaced with new cable at the Contractor's expense.
- O. Break-away shear-pins or other acceptable method of tension limitation shall be utilized on mechanical pulling equipment to prevent over-stressing cable during installation. To avoid insulation damage from excessive sidewall pressure at bends, the pulling tension, in pounds at a bend, shall not exceed 300 times the radius of the bend in feet.
- P. As soon as the cable is pulled into place, the pulling eyes, cable grips, or pulling loops shall be removed. On exterior pulls, the remaining cable ends shall be temporarily resealed with either a minimum of three (3) wraps of 2" Scotch #23 rubber splicing tape or heat-shrink caps. Exposed cable ends shall be wrapped in such a manner to prevent unintentional water entry. Cable ends or seals shall be installed prior to the end of the workday.
- Q. Cables shall not be bent to a radius of less than 4 times the overall diameter, including installation apparatus.
- R. Cable supports and securing devices shall be installed to provide adequate support without deformation of the cable jackets or insulation.
- S. Cables shall be routed within manholes and vaults such that adequate working space is provided within the structure for cable splicing and for the installation of future cables.
- T. All damaged or rejected cables shall be removed from the project site and replaced at no additional expense to the project.

3.02 CONNECTIONS AND TERMINATIONS (WIRE CONDUCTORS)

- A. Identify each conductor in panelboards, junction or pull boxes, or troughs with a permanent pressure sensitive label with suitable numbers or letters for easy recognition. Identify control wiring at each end and in junction boxes with numeric wire number corresponding to control wiring diagram.
- B. Thoroughly clean wire before installing lugs and connectors.
- C. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
- D. Terminate spare conductors with electrical tape, identify as "spares" and roll up in box.

3.03 TESTING (WIRE CONDUCTORS)

- A. Inspect wiring for physical damage and proper connection.
- B. All wire and cable shall be tested for continuity and short circuits prior to energizing circuits. Verify proper phasing, adjust as required.
- C. Comply with all applicable items in Section 16010 and 16950.

END OF SECTION 16123

DIVISION 16 – ELECTRICAL
Section 16160 – Cabinets and Enclosures

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Enclosures used to house electrical equipment.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements
- B. Section 16170 - Grounding and Bonding
- C. Section 16190 - Supporting Devices
- D. Section 16195 - Electrical Identification

1.03 REFERENCE TO STANDARDS

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- B. ANSI/NFPA 70 - National Electrical Code.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Cabinets and enclosures shall be delivered to jobsite in original shipping containers and shall be stored in a clean, dry location until ready for installation.

1.05 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Product Data: Provide manufacturer's standard data for enclosures and cabinets.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.06 QUALIFICATIONS

- A. Cabinet and Enclosure manufacturer shall be regularly engaged in construction of Product and shall have at least five years' experience.

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)

- A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS)

- A. Provide individual containers of touch up paint for each painted cabinet and enclosure.
- B. For each cabinet and enclosure with a locking mechanism, provide two spare keys.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 EQUIPMENT SPECIFICATION

A. NEMA 1

Enclosures shall be NEMA 1 rated, hinged, single or double door with slotted flush latch and white interior mounting panel, similar to Hoffman A-xxN Series (where xx is size subseries), or equivalent. Materials of construction shall be 14 or 16 gauge steel, depending on enclosure size, with polyester powder coating. Large enclosures shall have continuous hinge on door. Where noted, large enclosures shall include door operated light kits. Enclosures shall include grounding device kit or other means of positively grounding door to enclosure body.

B. NEMA 3R

Enclosures shall be NEMA 3R rated, hinged with stainless steel hinge pin, with drip shield, single door, white interior mounting panel and easily released door clamps. Materials of construction shall be 16 or 14 gauge steel, depending on enclosure size, with polyester powder coating. Furnish all exterior-mounted NEMA 3R enclosures with a NEMA 4X Drain-Vent (specified below) to remove interior moisture and condensation.

C. NEMA 4X

Enclosures shall be NEMA 4 / NEMA 4X / NEMA 12 rated, hinged, gasketed, single or double door, with easily released fast-operating clamp assemblies or quarter turn slotted latch kits replacing conventional screw clamps, white interior mounting panel and stainless steel hinge pin. Materials of construction shall be 16 or 14 gauge (depending on size) Type 304 stainless steel, Type 5052 H-32 aluminum, molded fiberglass polyester or corrosion resistant nonmetallic composite material. Interior mounting panel shall be steel, finish shall be white enamel. Where noted, enclosures shall include door operated light kits. Metallic enclosures shall include grounding device kit or other means of positively grounding door to enclosure body. Furnish all exterior-mounted NEMA 4X

enclosures with a NEMA 4X Drain-Vent (specified below) to remove interior moisture and condensation.

D. NEMA 7

Enclosures shall be NEMA 7 rated suitable for Class 1, Division 1, Group D hazardous locations. Materials of construction shall be copper-free aluminum and shall be either U.L. or F.M. listed and labeled for the application. Covers for small enclosures shall be threaded construction with minimum of 5 threads fully engaged after installation. Larger enclosures shall utilize bolted covers with all bolts torqued per manufacturer's requirements after installation.

E. NEMA 12

Enclosures shall be NEMA 12 rated, continuous hinge, gasketed, single or double door, with white interior mounting panel. Materials of construction shall be 16 or 14 gauge steel, depending on enclosure size, with polyester powder coating. Small enclosures shall be similar to Hoffman "CHQR" Series, or equivalent. Medium size enclosures shall include 1-point latch kits or quarter turn slotted latch kits replacing conventional external screw clamps. Large size enclosures shall include 3-point latch kits. Where noted, large enclosures shall include door operated light kits. Enclosure shall include grounding device kit or other means of positively grounding door to enclosure body.

F. Drain-Vents

Where noted or specified, enclosure Drain-Vents shall be furnished and installed in the bottom of enclosures in order to remove unwanted condensation and moisture from within enclosure. Units shall be NEMA 4X rated and shall maintain the NEMA 4X rating of enclosures when installed. Drain-Vents shall be as manufactured by Stahlin Enclosures Model DV4XKIT, or equivalent.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Inspect cabinets, enclosures and mounting panels for damage or rust. Inspect gasketing for proper sealing. Inspect hinges and clamps for proper operation.

3.02 PREPARATION

- A. Thoroughly clean interior and exterior of cabinets and enclosures. Sand and apply touch up paint where needed. Install mounting panels after equipment is mounted to it.

3.03 INSTALLATION

- A. Install cabinets and enclosures at locations shown on drawings and as directed by Owner's representative. Cabinets and enclosures shall be "stand off" mounted 1/2" from wall to provide free air flow behind cabinets and enclosures.
- B. To maintain NEMA 4X enclosure ratings, watertight hubs which are UL listed NEMA 4X shall be installed as necessary at conduit entrances to enclosure.

- C. At both interior and exterior locations, where enclosure or cabinet knockouts consist of tangential knockouts, the Contractor shall install weatherproof hubs sized for largest knockout, with a reducing bushing sized for the incoming conduit.

END OF SECTION 16160

DIVISION 16 – ELECTRICAL
Section 16170 – Grounding and Bonding

PART 1 GENERAL

- 1.01 WORK UNDER THIS ITEM INCLUDES THE ELECTRICAL GROUNDING AND BONDING OF THE SERVICE ENTRANCE GEAR, ELECTRICAL DISTRIBUTION EQUIPMENT, METALLIC RACEWAYS, METALLIC ENCLOSURES, UTILIZATION EQUIPMENT AND OTHER APPURTENANCES FOR THE WORK OR EQUIPMENT TO BE FURNISHED UNDER THIS PROJECT. IN GENERAL, ALL WORK SHALL MEET OR EXCEED THAT DEFINED IN ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE NEC/NFPA 70.
- 1.02 THIS SPECIFICATIONS SECTION NEITHER REPLACES ANY NEC REQUIREMENTS, NOR ARE ANY NEC REQUIREMENTS NOT SPECIFICALLY IDENTIFIED CONSIDERED DELETED FROM THE SCOPE OF WORK. ITEMS LISTED IN THIS SECTION ARE FURNISHED TO EITHER AUGMENT, OR EXCEED THOSE ESTABLISHED BY NEC.
- 1.03 WORK INCLUDES
- A. Equipment grounding conductors
 - B. Grounding Electrodes
 - C. Grounding Electrode Conductors
 - D. Bonding
- 1.04 RELATED SECTIONS
- A. Section 16010 – General Electrical Requirements
- 1.05 REFERENCE TO STANDARDS
- A. Article 250; ANSI/NFPA 70 - National Electrical Code (NEC)
 - B. NFPA 780 – Standard for the Installation of Lightning Protection Systems
- 1.06 DELIVERY, STORAGE AND HANDLING
- A. Ground rods shall be tie-wrapped together and stored away from contact with the earth.
 - B. Exothermic welds and hardware items shall not be shipped loose but shall be in boxes, labeled with material and equipment enclosed. Boxes shall be stored away from contact with earth and shall be protected from weather.
- 1.07 SUBMITTALS
- A. Submit under provisions of Division 1
 - 1. Ground rods
 - 2. Exothermic welding components

- 1.08 QUALIFICATIONS (RESERVED)
- 1.09 QUALITY ASSURANCE (RESERVED)
- 1.10 REGULATORY REQUIREMENTS (RESERVED)
- 1.11 COORDINATION
 - A. Installation of all Grounding and Bonding shall be coordinated with other trades and Sub-Contractors. Special attention is required for installation of Concrete-Encased Electrodes within structural footings.
- 1.12 MAINTENANCE SERVICE (WARRANTY)
 - A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.
- 1.13 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

- 2.01 MANUFACTURERS (RESERVED)
- 2.02 EQUIPMENT SPECIFICATION
 - A. Ground rods shall be UL listed, single-piece, 3/4" diameter by 10' long copper-clad steel with minimum 10 mil copper cladding.

All buried connections of grounding and bonding components shall be via exothermic weld only. Cold lap or compression grounding connections below grade will be rejected and replaced at Contractor's expense.
 - B. Exothermic Welding Equipment Manufacturers
 - 1. Erico – Cadweld
 - 2. Continental Industries – Therm-O-Weld
 - 3. Hagar – Ultraweld
 - C. Grounding conductors shall be 600 volt, same insulation type as used for phase conductors, green in color unless otherwise noted.
 - D. Grounding electrode conductors in contact to earth shall be bare, stranded, annealed copper. Grounding Electrode Conductors shall be the larger of that detailed on the project drawings, specified herein or as required by NEC.

PART 3 EXECUTION

- 3.01 EXAMINATION (RESERVED)
- 3.02 PREPARATION (RESERVED)

3.03 INSTALLATION

- A. A continuous grounding system shall be provided throughout the facility. The Contractor shall furnish and install all grounding and bonding as required per NEC and all Local Codes, whether or not specifically shown on the project drawings.
- B. Except for separately derived systems, a single-point ground system is intended throughout the facility. So-called “ Multi-point”, “ independent”, “ clean” or “separate” grounding systems that are not inter-bonded to the single-point facility system do not comply with NEC, are unsafe, and will be rejected.
 - 1. On occasion, supplemental driven ground rods may be required on the project drawings. All such supplemental ground rods are to be bonded to the equipment grounding conductor and are NOT intended to indicate any separation of, or isolation from, the facility grounding system.
- C. Equipment ground conductors (green insulated) shall be used solely for grounding and bonding purposes and be kept entirely separate from grounded neutral conductors (white insulation), except where bonded at the Service Entrance equipment.
 - 1. The system Neutral and Ground conductors shall be bonded together through the Main Bonding Jumper in the Service Entrance Equipment only.
 - 2. Unless otherwise directed on the project drawings, Grounding Electrode Conductors shall terminate on the Neutral Bus within the Service Entrance equipment.
 - 3. The Main Bonding Jumper within the Service Entrance equipment shall be accessible for visual inspection.
- D. Bond the system Neutral and Ground within Utility-owned KWH metering or Current-Transformer (C.T.) Cabinets ONLY if specifically required by the serving Utility. Otherwise, bond the system neutral and the ground in Service Entrance Equipment as described below.
- E. Service Entrance Equipment Grounding and Bonding
 - 1. Furnish grounding bushings on all metallic service conduits entering Service Entrance Equipment. Bond each bushing to Neutral bus in the Service Entrance Equipment as required by NEC Article 250.92 and 250.102C.
 - 2. The System (Main) Bonding Jumper shall be installed within the Service Entrance Equipment and shall connect the Neutral Bus to the Ground Bus.

- a. The Main Bonding Jumper shall consist of either a UL Listed bonding link furnished by the Service Equipment manufacturer or a copper bonding conductor sized to requirements in NEC Article 250.28D.
- b. Do not re-bond Neutral and Ground downstream unless required by special conditions, such as those described in NEC Article 250.32.

F. Grounding Electrode System

- 1. As a minimum, the Grounding Electrodes shall comply with NEC Articles 250.52 and 250.53. Where present at each new building or structure, all available Grounding Electrodes defined in NEC Article 250.52A1 thru A4 shall be interconnected to form the Grounding Electrode System.
- 2. Per NEC Article 250.68A, the Grounding Electrode System shall be installed in such a manner that each connection point may be visually inspected, unless encased by concrete or earth.
- 3. Per NEC Article 250.64, Grounding Electrode Conductors shall be installed without splice between Service Entrance Equipment Neutral bar and Grounding Electrodes. Where required due to distance or construction, splicing shall be permitted by means of exothermic welding only. Irreversible "H" and "C" type compression connectors shall NOT be utilized for Grounding Electrode Conductors.
 - a. Where exposed or visible, all Grounding Electrode Conductors (regardless of size) shall be protected from physical damage using non-metallic conduit, such as Schedule 40 PVC. Extend protective conduit as close as practical to the Grounding Electrode. Any metallic conduits installed by the Contractor for grounding electrodes must be bonded at both ends per NEC Article 250.64E.
 - b. Where a copper Grounding Electrode System Bus-Bar is indicated on the project drawings, it shall be sized as noted but not less than 1/4" T x 2" W x 24" L. Size of the single copper Grounding Electrode Conductor between the Service Entrance Neutral Bus and the Grounding Electrode System Bus-Bar shall be the larger of that shown in NEC Table T250.66 or as noted on the project drawings. Connection of Grounding Electrode Conductors to a Grounding Electrode System Bus-Bar shall be through the use of listed compression-type lugs bolted to the Bus-Bar.
- 4. Grounding Electrode Conductors shall be individually installed from the Service Entrance Neutral Bus (or Grounding Electrode System Bus-Bar) to the respective Grounding Electrode. "Looping" of Grounding Electrode conductors (extending a suitably-sized single grounding electrode

conductor from electrode-to-electrode) shall NOT be utilized without written approval from the Engineer.

5. Connection of Grounding Electrode Conductors to individual Grounding Electrodes shall comply with NEC Article 250.70.
 - a. Connection at all Grounding Electrodes shall be by use of exothermic welding, Listed clamp or compression connections shall NOT be utilized without written approval from the Engineer.
 - b. Below-grade ground rod and associated ground wires shall be clean and dry before performing the exothermic weld. Verify that the proper size and type of exothermic weld kit is used before beginning work
 - c. Exothermic welds shall be left exposed for inspection and approval before backfilling or otherwise concealing. Any unacceptable exothermic welds shall be redone, including any necessary replacement material (ground rods, ground wires, etc.) as needed to provide an accepted exothermic weld.
6. Non-Metallic conduits containing grounding electrode conductors shall not be supported with metal clamps that completely encircle the conduit. Use nylon nuts, bolts, straps and/or reinforced fiberglass or premium grade plastic resin strut support with non-metallic hardware as manufactured by Aickinstrut, or equivalent.
7. All of the following shall be interconnected, where available:
 - a. Bond metallic underground water piping in direct contact with earth for no less than 10 feet per NEC Article 250.52A1. Size of the copper bonding jumper shall be the larger of that shown in NEC Table T 250.66, or as noted on the project drawings. Installation shall comply with NEC Article 250.53. Connection shall be made at a point less than 5 feet from where the metallic water piping enters the facility. Furnish bonding around removable equipment (water meters, etc.) per NEC Article 250.68B.
 - 1) Note that NEC Article 250.53D2 requires a Supplemental Grounding Electrode when a metallic underground water pipe is the sole Grounding Electrode. The Supplemental Grounding Electrode shall be one of those described in NEC Articles 250.52A2 through 250.52A7. See also paragraph 16170-3.03F8 below.

- b. Metal frames of buildings or structures shall be bonded per NEC Article 250.52A2. Size of the copper bonding jumper shall be the larger of that shown in NEC Table T 250.66, or as noted on the project drawings. Installations shall comply with NEC Article 250.53.
- c. Furnish concrete-encased electrodes (commonly called "Ufer" ground) per NEC Article 250.52A3 and install per NEC Article 250.53.
 - 1) The size of the copper conductor which is the sole connection to the concrete-encased electrode shall be the larger of that shown on the project drawings or #4 AWG.
 - 2) The Concrete-Encased Electrode (CEE) shall be no less than #4 rebar ($\frac{1}{2}$ " diameter) with a minimum length of 20 feet long placed in bottom of concrete footing encased by no less than 2" of concrete in direct contact with earth.
 - 3) Within the concrete encasement, connect the grounding electrode conductor to the re-bar by means of exothermic weld, Cadweld, or equivalent. Compression connections will not be accepted as an alternate termination method of connection within the concrete envelope.
 - 4) **The Contractor shall provide all necessary coordination between the Sub-Contractors and trades for the implementation of this item before concrete is placed.**
 - 5) Do not use Insulated (plastic or epoxy coated) re-bar for concrete-encased electrodes. If the structural construction requires insulated or plastic-coated re-bar, add a minimum of 20 feet bare, non-coated re-bar to create the Grounding Electrode.
 - 6) For installations that may structurally utilize re-bar smaller than #4, tie-wrap a minimum of 20' length of no smaller than #4 AWG bare copper Grounding Electrode to the re-bar in the bottom of the footing prior to installation of concrete.
- d. Furnish a Grounding Electrode Ground-Ring only where specifically noted on the project drawings. Ground-Rings shall comply with NEC Article 250.52A4 requirements and be installed per NEC Article 250.53. Where utilized, all Ground-Rings must encircle the entire facility (form a closed-loop). Size of the copper Grounding Electrode Conductor which is the sole connection to the ground-loop shall be the larger of that shown on the project drawings or #2 AWG.

8. On projects where the only Grounding Electrode Listed in NEC Article 250.52A through 250.52D is a metallic underground water pipe, it must be supplemented by another grounding electrode per NEC Article 250.53D2. Unless directed otherwise, the supplemental grounding electrode shall be a driven ground field.
 - a. Ground field shall consist of a triangle 10 feet on each side, with a driven ground rod at each vertex of the triangle. Size of the copper Grounding Electrode Conductor, and the bonding jumpers between all ground rods, shall be the larger of that shown on the project drawings or #6 AWG.
 - b. If required due to space constraints, furnish two (2) ground rods a minimum of 10 feet apart. Deviations from the triangular-shaped ground field shall require written approval by the Engineer prior to installation.
- G. All metallic raceways, boxes, enclosures, etc. shall include an insulated equipment ground conductor. Due to corrosion, metallic raceway and conduit connectors alone WILL NOT be considered as meeting this requirement. The Equipment Grounding Conductor shall positively bond all electrical components and utilization equipment to the facility ground system.
- H. All metallic boxes used for electrical equipment shall include listed grounding screws or lugs. No more than one grounding conductor shall be installed per lug location unless lug is listed for multiple conductors.
- I. The largest factory-scored concentric conduit knockouts shall be used to provide conduit bonding to NEMA 1 & 3R enclosures.
 1. If required, provide a conduit reducing hub for the specific conduit size terminated.
- J. Equipment Grounding Conductors shall be sizes as shown in NEC T250.122, but no less than #12 AWG.
- K. Where "isolated" ground receptacles are shown on the project drawings, furnish a separate, insulated, equipment grounding conductor directly between the supply panelboard ground bus and the "isolated" ground outlet. Equipment grounding conductors for "isolated" ground outlets shall not be extended or looped from other outlets or equipment.
- L. Isolated, exposed metal conduit segments (e.g. within manhole or handhole) shall be bonded with a bare copper conductor sized from NEC T 250.122. Bonding jumper size shall be based upon the largest ampacity circuit contained within.
- M. Bonding of metallic components of manhole and handhole frames and lids as well as all exposed metal conduit sections of underground duct bank is covered under Specifications 16118 "Exterior Underground Duct Bank".
- N. All other exposed metal piping (e.g. air, fire-protection, natural gas, metallic process piping etc.) and exposed structural steel not used as a Grounding

Electrode shall be bonded to the Grounding Electrode System per NEC Article 250.104. Size of the copper bonding jumper shall be no smaller than that shown in NEC Table T250.66.

- O. All communications systems described in NEC Chapter 8 shall be bonded to system ground. Installation shall comply with NEC Article 250.94 and Articles 800, 810, 820 and 830. Size of the copper bonding jumper shall be # 6 AWG unless otherwise noted on the project drawings.
- P. General Requirements for Separately Derived Systems (e.g. Two-Winding Transformers)

Solidly-Grounded Separately-Derived Systems shall be installed per NEC Article 250.30 requirements. In general, the following shall apply for solidly-grounded two-winding transformers unless specifically directed otherwise on the project drawings.

1. Primary Equipment Ground conductor shall terminate on transformer ground lug "G".
2. Install the transformer "X0-G" link, or system bonding jumper, within the transformer housing only. Where the System Bonding Jumper consists of a field-installed copper conductor, it shall be sized to NEC Table 250.66 but not less than 12½% of the total cross-sectional area of the secondary phase conductors.
3. Secondary Neutral conductors shall be terminated on transformer "X0" Lug.
4. Secondary Equipment Ground conductors shall be terminated on transformer ground lug "G".
5. Bond the transformer Neutral "X0" to the nearest grounding electrode in accordance with Article 250.30A7 of the NEC. The grounding electrode conductor shall be sized per Table 250.66, "Grounding Electrode Conductor for Alternating-Current Systems of the latest edition of NEC. Grounding Electrode conductor shall be installed in either non-metallic conduit (Schedule 40 PVC) or bonded at both ends of metallic conduit per NEC Article 250.64E.
6. Neutral and Ground Bus in all downstream equipment shall be kept isolated. Do not re-bond downstream unless required by special conditions, such as those described in NEC Article 250.32.

- Q. On-Site Generation (e.g. Standby or Emergency Engine-Generators)

Unless otherwise noted on the project drawings, on-site generators are NOT to be installed as a separately derived system. Unless specifically shown otherwise on the project drawings, DO NOT bond Neutral and Ground at the generator.

1. Separate Neutral conductors plus separate Equipment Ground conductors shall be extended between distribution equipment (typically a 3-Pole Transfer Switch) and engine-generator system.

2. Generator Equipment Ground conductor shall be terminated on generator ground lug "G".
3. Generator Neutral Conductors shall be terminated on generator Neutral lug "X0".
4. DO NOT install "X0-G" bonding strap at generator. Contractor shall field-inspect generator and remove the "X0-G" jumper if found installed by factory prior to shipping.
5. Unless otherwise shown on the project drawings, the Transfer Switch will be a 3 -Pole de vice switching the phase-conductors only. Unless the Transfer Switch the Service Entrance Equipment, the isolated Generator Neutral is to pass un-switched through the 3-Pole ATS and terminate on the Service Entrance "X0" Neutral Bus.
6. The Generator Ground conductor shall be terminated on the Service Entrance system Ground bus or Ground lug "G".
7. The system Neutral-Ground bond is to be installed at one location at the Service Equipment ONLY. All downstream equipment shall keep Neutral and Ground conductors isolated and insulated from each other.

3.04 TESTING

- A. As described in Specifications Section 16950.
- B. All grounded metal cases and parts associated with electrical equipment shall be tested for continuity with ground system.
- C. If requested, testing shall be performed in the presence of the Owner's representative.
- D. Provide a copy of all testing reports to Engineer for record purposes.

END OF SECTION 16170

DIVISION 16 – ELECTRICAL
Section 16190 – Supporting Devices

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Strut-type framing for conduit and equipment supports
- B. Cable Rack saddle-type supports
- C. Anchors and Fasteners

1.02 RELATED SECTIONS

- A. Section 16010 – General Electrical Requirements

1.03 REFERENCE TO STANDARDS

- A. ANSI/NFPA 70 - National Electrical Code.
- B. NECA - National Electrical Contractors Association.
- C. ASTM No. A570 G33
- D. ASTM No. A-123
- E. ASTM No. A-525

1.04 DELIVERY, STORAGE AND HANDLING

- A. Stored conduit and equipment supports shall not be in contact with earth, but shall be on pallets or other above-grade supports. Conduit and equipment supports shall be covered to minimize exposure to weather.
- B. Anchors and fasteners shall be stored in their original containers in a clean, dry place. They shall not be exposed to weather.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01300
- B. Product Data: Provide manufacturer's catalog data for fastening systems and supports.
- C. Manufacturer's instructions: Include application conditions and limitations for use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination and installation of Product.

1.06 QUALIFICATIONS (RESERVED)

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY) (RESERVED)

- A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 MOUNTING STRUT

- A. Where utilized, strut-type metal framing shall be provided to mount and support electrical equipment and enclosures as indicated on the drawings.
- B. Strut-type supports shall be either aluminum or stainless steel construction. Unless specifically identified for use on the drawings, painted or factory coated steel, galvanized steel or non-metallic strut are not acceptable alternates to this requirement. Use stainless steel on all project locations where strut is in direct physical contact with earth.
- C. Unless specifically noted to be Type 316 Stainless Steel only, Stainless Steel strut-type metal framing may be Type 304 or Type 316 Stainless Steel.
- D. Aluminum strut-type metal framing shall be Type 6063-T6 Aluminum.
- E. All mounting hardware shall be stainless steel.
- F. Manufacturers:
 - 1. Unistrut: P-1000 EA (Aluminum), P-1000 SS (Stainless Steel)
 - 2. B-Line: B22AL (Aluminum), B24SS (Stainless Steel)
 - 3. Equivalent meeting specifications

2.02 CABLE RACKS

- A. Cable racks within manholes, handholes and vaults shall be non-metallic saddle type construction as manufactured by Underground Devices, Inc.; Northbrook, IL, or equivalent. All mounting hardware shall be stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine all supports and fasteners for straightness, rust and corrosion. Do not use any equipment that is not straight or is rusted or corroded.

3.02 PREPARATION

- A. All equipment shall be clean at time of installation. Remove all burrs.

3.03 INSTALLATION

- A. Install products in conformance with manufacturer's instructions and as detailed in drawings.
- B. Provide anchors, fasteners and supports in accordance with NECA Standard of Installation. Do not use spring steel clips or clamps except as noted in Section 16190-3.03H.
- C. Do not fasten supports to pipes (except where detailed on drawings), ducts, mechanical equipment (except where detailed on drawings), or conduit.
- D. Install surface mounted cabinets, enclosures and panelboards with a minimum of four anchors.
- E. Provide materials, sizes and types of anchors, fasteners, and supports necessary to carry loads of equipment and conduits. Consider weights of equipment and conduit when selecting products.
- F. Provide all necessary hardware, such as floor flanges, in order to install equipment as specified or as shown on the drawings.
- G. Include knee-braces and stiffeners as necessary to provide rigid support such that equipment does not bounce or sway.
- H. Use spring-lock washers under all nuts.

3.04 INTERFACE WITH OTHER PRODUCTS (RESERVED)

3.05 MANUFACTURER'S FIELD SERVICES (RESERVED)

END OF SECTION 16190

DIVISION 16 – ELECTRICAL
Section 16195 – Electrical Identification

PART 1 GENERAL

1.01 WORK INCLUDES

- A. This section includes field-installed nameplates, labeling and identification methods for electrical equipment, components and wiring.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements\

1.03 REFERENCE TO STANDARDS

- A. ANSI/NFPA 70 - National Electrical Code

1.04 DELIVERY, STORAGE AND HANDLING

1.05 SUBMITTALS

- A. Product Data: Provide catalog data for nameplates, labels and markers.
- B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.
- C. During course of construction, Contractor shall submit Wiring Identification Tables, listing wire marker identification schedules of all proposed wiring and terminations.

1.06 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.

PART 2 PRODUCTS

2.01 EQUIPMENT SPECIFICATION

- A. Nameplates and legend plates shall be engraved three-layer laminated plastic, black letters on white background. Legends (wording) shall be as detailed on drawings or as directed by Owner's representative.
- B. All wire markers installed on electrical equipment above grade shall be weatherproof and water resistant. Wire identification labeling, whether factory applied or written in the field, shall utilize an adhesive that does not soften or weaken over time. Sleeve or tubing type labels may be utilized as an alternate. Paper adhesive-backed wire markers will be rejected and replaced at the Contractor's expense. Wire marker labels shall be as manufactured by Brady, or equivalent.

- C. All wire markers installed below grade in manholes, handholes or vaults shall be waterproof. Markers shall be non-corroding plastic clip-on sleeve type construction. Markers shall be permanently factory-printed such that label identification will not deteriorate due to time or contact with water. Wire markers used below grade shall be Brady Clip-Sleeve, or equivalent.
- D. Provide and install Safety Stripe Tapes on finished floors around electrical gear noting clearances required per NEC Article 110.26. Tape shall be minimum 2" in width with alternating black/yellow striping. Tape shall be Scotch/3M #5702 or equivalent.

PART 3 EXECUTION

3.01 PREPARATION

- A. Degrease and clean surfaces to receive nameplates, legend plates and markers.

3.02 INSTALLATION

- A. Secure nameplates and legend plates to equipment using screws or adhesive.
- B. Nameplates or legend plates shall be provided for all disconnects, enclosed starters, control panels, transformers, level meters, flow meters and recorders.
- C. Wiring Device Identification Labels shall be furnished and installed on all wiring device cover plates per Specifications Sections 16141-3.01O and 16141-3.01P.
- D. Provide wire markers for ALL wires and terminations. By "all", this is intended to include, but not be limited to, all terminations at distribution panelboards, motors, valves, heaters, fan coils, heat pumps, fans, dampers, all MCC terminations, instrumentation & controls, terminal blocks and switches, etc. Wire identification shall be unique to wire that is marked or to terminal that wire lands upon. Identification of a run of wire from termination to termination shall be same throughout run.
- E. Provide wire markers in all manholes, handholes and vaults.
- F. Include markers labeled "SP" on all spare conductors.

END OF SECTION 16195

DIVISION 16 – ELECTRICAL
Section 16422 – Temporary Power

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Work included in this section is supply of temporary electrical power as required to complete work as indicated on drawings and specified herein.
- B. All energy costs, demand costs and applicable one-time charges billed by serving utility for Temporary Power shall be paid for by the Contractor and included in base-bid price. They will not be paid for separately.
- C. It shall remain solely the Contractor's responsibility to ensure proper system voltage and adequate electrical construction power capacity are available for his work. If construction site is at an operational facility, the Contractor's temporary construction power shall not impact Owner's operations in any manner.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements.
- B. Section 16111 - Conduit and Raceway.
- C. Section 16123 - Building Wire and Cable.
- D. Section 16170 - Grounding and Bonding.
- E. Section 16190 - Supporting Devices.
- F. Section 16441 - Enclosed Switches.

1.03 REFERENCE TO STANDARDS

- A. NFPA 70 – National Electric Code (most current issue)
- B. Requirements and standards as noted by serving utility

PART 2 PRODUCTS

2.01 MATERIALS

- A. May be new or used, but shall be adequate for purposes used, shall not create unsafe conditions, nor violate specified codes. Comply with Federal, State and local regulations.
- B. Any and all additional work as required by serving electrical utility shall be considered incidental to this specification.

PART 3 EXECUTION

3.01 TEMPORARY ELECTRICITY DURING CONSTRUCTION

- A. Contractor shall be solely responsible to make necessary arrangements and provide temporary electric service for construction equipment and lighting required during the entire construction period including all utility fees, service charges, and permits.
- B. Electric services shall be of sufficient capacity and characteristics to supply proper current for various types of construction tools, motors, welding machines, lights, heating plant, air conditioning system, pumps and other work required. All necessary temporary wiring, panel boards, outlets, switches, lamps, fuses, controls and accessories shall be provided by Contractor. A sufficient number of electric outlets shall be provided along with adequate lighting. Materials used for temporary services shall not be used in permanent system unless specific approval is given by Owner's representative. Temporary service shall be so constructed and arranged as not to interfere with progress of other trades. This system shall be erected and maintained strictly in accordance with all ordinances and requirements for temporary service pertaining thereto inclusive of OSHA and NEC.
- C. All 15A and 20A receptacles used for temporary power shall be ground fault circuit interrupter type, per NEC Article 590.

3.02 TEMPORARY POWER FOR CONTINUITY OF SERVICE TO FACILITY

- A. If the work to be performed under this contract is to be performed at an existing complex, it is imperative that these facilities remain operational during the performance of work under this contract. There shall be no power outages of any duration whatsoever without the express written consent of the owner. Failure to comply with this requirement could result in substantial penalty charges being assessed the Contractor.**
- B. Maximum duration of any single power outage, whether partial or complete, shall be four (4) hours - however this maximum duration shall apply only when convenient to the owner and, again, only with the written approval of the owner's authorized representative.**

3.03 TEMPORARY POWER REMOVAL

- A. Any Contractor who has installed a temporary utility connection as herein specified, shall, prior to final acceptance, remove temporary connections and installations and leave premises restored to condition in which it was found.

END OF SECTION 16422

DIVISION 16 – ELECTRICAL
Section 16441 – Enclosed Switches

PART 1 GENERAL

1.01 WORK INCLUDES

- A. This section includes enclosed safety switches for use as service disconnects, feeder and branch circuit switching and disconnect switches for motors and equipment.
- B. This section shall also include double-throw safety switches used as manual transfer switches.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements.
- B. Section 16170 - Grounding and Bonding.
- C. Section 16190 - Supporting Devices.
- D. Section 16195 - Electrical Identification.

1.03 REFERENCE TO STANDARDS

- A. ANSI/NFPA 70 - National Electrical Code.
- B. NEMA KS 1 - Enclosed Switches.
- C. NECA - National Electrical Contractors Association.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.04 DELIVERY, STORAGE AND HANDLING

- A. Single-Throw and Double-Throw Safety Switches shall be stored in original containers as delivered to jobsite. Safety switches shall be stored on pallets or other supports to prevent contact with earth. Safety switches shall be covered to protect them from weather.

1.05 SUBMITTALS

- A. Submit under provisions of Division 1.
- B. Product Data: Provide catalog data for switch ratings and enclosure dimensions.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.06 QUALIFICATIONS (RESERVED)

1.07 QUALITY ASSURANCE

- A. Perform work in accordance with NECA Standard of Installation.

1.08 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)

- A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Square D
- B. Cutler-Hammer
- C. Siemens
- D. General Electric

2.02 EQUIPMENT SPECIFICATION

- A. Safety switches (disconnects) shall be rated for use at 480 Volts, 3 phase and shall be Heavy Duty, NEMA KS 1 load interrupter enclosed knife switch with externally operated handle interlocked to prevent opening front cover with switch in ON position. Disconnect handle shall be lockable in OFF position.
- B. Safety switch enclosures shall be NEMA 4X, unless otherwise indicated on drawings.
- C. Where noted on project drawings, disconnects shall be fusible-type and shall include high-interrupting capacity, U.L. Class "R" time-delay (slow-blow) fuses, Buss, or equivalent. Fuse ampacities shall be as noted on the project drawings. Three spare fuses of each ampacity used on the project drawings shall be provided with each fusible disconnect.
- D. Where noted, disconnects shall be U.L. Listed as suitable for use as Service Entrance Disconnect Equipment. Provide Ground Kit and Neutral Kit where required.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Inspect safety switches for proper operation. Disconnect switch movement shall not bind at any point in its travel. Inspect enclosures for corrosion and water tightness.

3.02 PREPARATION (RESERVED)

3.03 INSTALLATION

- A. Install safety switches (disconnects) where detailed on drawings. All switches shall be mounted to strut-type framing.
- B. All safety switches shall be bonded to equipment grounding system.
- C. Provide nameplate for each safety switch as detailed on drawings or as directed by Owner's representative.
- D. Inspect all disconnects for proper operation, tight and secure connections, and correctness. Adjust as necessary to assure proper operation.

3.04 INTERFACE WITH OTHER PRODUCTS (RESERVED)

3.05 MANUFACTURER'S FIELD SERVICES (RESERVED)

3.06 TESTING

- A. Test all disconnects for proper operation and continuity on all poles when in the closed (ON) position.

END OF SECTION 16441

DIVISION 16 – ELECTRICAL
Section 16470 – Panelboards

PART 1 GENERAL

1.01 WORK INCLUDES

- A. Work included in this section is supply and installation of power and lighting panelboards to provide a complete and operational electrical system.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements
- B. Section 16111 - Conduit and Raceway
- C. Section 16120 - Building Wire and Cable
- D. Section 16170 - Grounding and Bonding
- E. Section 16190 - Supporting Devices
- F. Section 16195 - Electrical Identification
- G. Section 16671 - Surge Protective Devices

1.03 QUALITY ASSURANCE

- A. Panelboards shall be manufactured and supplied by a company regularly engaged in business of furnishing panel boards. If required by Owner's representative, manufacturer shall submit a certification to a minimum experience of five years in manufacture of panelboards.

1.04 REFERENCE TO STANDARDS

- A. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum)
- B. U.L. Standard 489 - Molded Case Circuit Breakers, Molded-Case Switches, and Circuit Breaker Enclosures
- C. U.L. Standard 67 - Panelboards
- D. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less
- E. NFPA 70 - National Electrical Code
- F. NECA (National Electrical Contractors Association) "Standard of Installation"
- G. NEMA AB 1 - Molded Case Circuit Breakers
- H. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies
- I. NEMA KS 1 - Enclosed Switches
- J. NEMA PB 1 – Panelboards

1.05 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Submittals shall include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker arrangement and sizes. Submittals shall also include manufacturer's installation instructions; indicating application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting the product.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Panelboards shall be stored indoors from time of delivery to jobsite, protected from weather and damage.

1.07 MAINTENANCE SERVICE (WARRANTY)

- A. All equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cutler-Hammer/Westinghouse
- B. Square D
- C. General Electric
- D. Siemens
- E. Equivalent

2.02 EQUIPMENT

- A. Panelboard shall be provided with bolt-on circuit breakers of size and rating as detailed in panel schedule on plans. Breakers shall be 1, 2 or 3-pole with an integral crossbar to assure simultaneous opening of all poles in multipole circuit breakers. Breakers shall have an overcenter, trip-free, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication. Handles shall have "ON", "OFF" and "TRIPPED" positions. Circuit breakers shall be UL listed in accordance with UL Standard 489.
- B. Panelboards bus structure and main lugs or main circuit breakers shall have current ratings as shown on panelboard schedule. Bus material shall be copper with either silver or tin plating. Bus ratings shall be in accordance with UL Standard 67. Bus bar connections to branch circuit breakers shall be the "distributed phase" or phase sequence type.

- C. Panelboard bus assembly shall be enclosed in a steel cabinet rated NEMA 1 (unless otherwise noted on the drawings). Box front shall include a door and have a flush, cylinder tumbler-type lock and catch and spring-loaded stainless steel door pull. Door shall have completely concealed hinges when closed and shall not be removable when locked. A circuit directory frame and card with a clear plastic cover shall be provided on door interior.
- D. Panelboards shall be nominal 20" in width unless otherwise noted.
- E. Panelboards rated 240 VAC or less shall have short-circuit ratings as shown on the drawings, or as herein scheduled, but not less than an integrated equipment rating of 10,000 amps RMS symmetrical. All units shall bear UL label.
- F. Panelboards rated 480 VAC shall have short-circuit ratings as shown on the drawings, or as herein scheduled, but not less than an integrated equipment rating of 65,000 amps RMS symmetrical. All units shall bear UL label.
- G. Except where noted otherwise on the drawings, all panel boards shall have neutral bar and ground bar bonded together. Where neutral bar and ground bar are noted to be isolated, the contractor shall verify during wiring installation that neutral and ground conductors are terminated on the correct bar.
- H. Where schedule on drawings indicates "SPARE", a complete circuit breaker of the ampacity and number of poles indicated is to be provided. Where schedule on drawings does not indicate a specific size circuit breaker provide a 20 AMP single pole circuit breaker for each of the remaining unused poles. Therefore, panelboard shall be filled with feeder circuit breakers.
- I. All circuit breakers feeding HVAC equipment shall be HACR rated.
- J. Multi-pole circuit breakers with removable tie-links are not acceptable.
- K. Tandem circuit breakers (two circuit breakers on single pole frame) are not acceptable.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install panel boards where shown on the plans, in accordance with manufacturer's directions and in accordance with NEMA PB1.1. Install panelboards plumb. Provide filler plates for unused spaces in panelboards. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes as required.
- B. Provide legend plates for all panel boards to identify panel board as well as voltage, phase and number of wires (example "LP-1, 208Y/120 VAC, 3 PHASE, 4 WIRE"). Legend plates shall comply with Section 16195 - Electrical Identification.
- C. Panelboard Surge Protective Device shall be installed in compliance with Section 16671.

3.02 TESTING

- A. Panelboards and load centers shall be thoroughly tested after installation and connection to respective loads. Lighting panelboard phases shall be measured with all major items operating. Phase loads shall be within 20 percent of each other. Rearrange circuits if required maintaining proper phasing for multi-wire branch circuits.
- B. Test for shorts and high resistance grounds. Check for faulty operation of circuit breakers and correct as needed.

END OF SECTION 16470

DIVISION 16 – ELECTRICAL
Section 16671 – Surge Protective Devices

PART 1 GENERAL

1.01 WORK INCLUDES

- A. This specification describes the requirements for Surge Protective Devices (formerly called “Transient Voltage Surge Suppression” or “TVSS”). Surge Protective Device equipment shall be furnished for all locations where noted on project Drawings, referenced in other equipment specifications or as described herein.
- B. Additionally, where drawings note to add surge protection to existing equipment, provide equipment as specified herein or as noted on the project drawings.
- C. Provide supplemental Surge Suppressors on each end of all 4-20 mADC signal lines which originate at, or terminate on, devices located on exterior of building. Typical equipment would include, but not be limited to, magmeters located in exterior meter pits and wet-well transmitters. Where 4-20 mADC signals both originate and terminate within a single building, no supplemental surge protection is required.

1.02 RELATED SECTIONS

- A. Section 16010 - General Electrical Requirements.
- B. Section 16170 - Grounding and Bonding.
- C. Section 16470 – Panelboards

1.03 REFERENCE TO STANDARDS

- A. ANSI/NFPA 70 - National Electrical Code (most current issue).
- B. U.L. 1449/ANSI “3rd Edition” - Surge Protective Devices
- C. U.L. 1283 – Electromagnetic Interference Filters.
- D. IEEE C62.41– Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits
- E. IEEE C62.45 – Guide on Surge Testing for Equipment Connected to Low-Voltage Power Circuits
- F. NEMA LS-1 – Low Voltage Surge Protection Devices

1.04 DELIVERY, STORAGE AND HANDLING

- A. Electrical surge protection equipment shall be stored in a clean dry place, away from construction.

1.05 SUBMITTALS

- A. Product Data: Provide catalog data for electrical surge protection equipment.

- B. Provide information to verify 3rd party testing certification on assembled equipment ratings. Ratings on individual components will not meet this requirement and will not be considered.
- C. Provide verification that the SPD complies with the required ANSI/UL 1449 3rd Edition listing by Intertek (ETL), Underwriters Laboratories (UL) or other Nationally Recognized Testing Laboratorys (NRTL). Compliance may be in the form of a file number that can be verified on ETL's or UL's website or on any other NRTL's website, as long as the website contains the following information at a minimum: model number, SPD Type, system voltage, phases, modes of protection, Voltage Protection Rating (VPR), and Nominal Discharge Current (I_n). Language similar to "Manufactured in accordance with . . ." will not meet the intent of this specification requirement.
- D. Manufacturer's Instructions:

Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.

1.06 QUALIFICATIONS

- A. Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation and installation of Product.
- B. Third party tested for compliance.

1.07 QUALITY ASSURANCE (RESERVED)

1.08 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and shown.

1.09 COORDINATION (RESERVED)

1.10 MAINTENANCE SERVICE (WARRANTY)

- A. As a minimum, all equipment shall be warranted to be free from defects in material and workmanship for a period of one year from date of substantial completion established by the Owner.

1.11 EXTRA MATERIALS (SPARE PARTS) (RESERVED)

PART 2 PRODUCTS

2.01 EQUIPMENT SPECIFICATION

- A. UL Category Code VZCA = UL 1449 3rd Edition Surge Protective Devices.
- B. All Electrical Surge Protection hardware shall be U.L. Listed and labeled as "Surge

Protective Devices” under the latest edition of UL 1449 “3rd Edition”.

- C. Visual indication that surge suppressors are functioning properly shall be furnished in the form of display, pilot light or LED for each device. If manufacturer utilizes LED's or pilot lights, one indicator shall be provided for each leg of a multi-phase device.
- D. Where Surge Protective hardware is not an integral part of a factory-assembled piece of equipment (such as factory installed in a switchboard or MCC), manufacturer or Contractor shall furnish all equipment, brackets and appurtenances necessary in order to properly install suppressors to manufacturer's requirements.
- E. Electrical Requirements – Power Distribution Equipment
 - 1. Unit operating voltage and configuration – Refer to Drawings
 - 2. SPD Types:

Type 1: Can be installed before service disconnect overcurrent device. (Old equivalent: Secondary surge arrestor, lightning arrester.) Nominal Discharge Current Rating - 10kA or 20kA.

Type 2: Can only be installed after service disconnect overcurrent device. (Old equivalent: TVSS) Nominal Discharge Current Rating - 3kA, 5kA, 10kA or 20kA.

Type 3: Point of Utilization SPD. Installed a minimum 10 m (30ft) of conductor between service disconnect overcurrent device and surge protective device. (Old equivalent: Plug-In surge trips, surge receptacles).

Type 4: Component SPD. Does not have full enclosure; intended solely for installation in another listed device. Must pass all tests relevant to installation location (Type 1 or Type 2). (Old equivalent: UR recognized component.)

- 3. The suppression system shall incorporate thermally protected metal oxide varistors (MOVs) as the core surge suppression component for the service entrance and all other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cell, air gaps, etc.
- 4. Maximum Continuous Operating Voltage (MCOV) – The MCOV shall be greater than 125% of the nominal system operating voltage.
- 5. Protection Modes: The SPD must protect all modes of the electrical system being utilized. The required protection modes are indicated by bullets in the following table:

LN = Line to Neutral
LL = Line to Line
LG = Line to Ground
NG = Neutral to Ground

Wye System: LN-A Phase, LN-B Phase, LN-C Phase, LG-A Phase, LG-B Phase, LG-C Phase, NG

Delta System: LL-A Phase, LL-B Phase, LL-C Phase, LG-A Phase,

LG-B Phase, LG-C Phase

Single Phase System: LN-A Phase, LN-B Phase, LG-A Phase, LG-B Phase, NG

High Leg Delta: LN-A Phase, LN-B Phase, LN-C Phase, LG-A Phase, LG-B Phase, LG-C Phase, NG

6. Voltage Protection Ratings (VPR) shall not exceed the following per UL-1449:

Modes	208Y/120	480Y/277
L-N; L-G; N-G	600 V	1000 V
L-L	900 V	1800 V

7. ANSI/IEEE Cat. C3 Let Through Voltage – The let through voltage based on IEEE C62.41 and C62.45 recommended procedures for Category C3 surges (20 kV, 10 kA) shall be less than:

Modes	208Y/120	480Y/277
L-L	1240V	2060V
L-G	1000V	1580V
L-N, N-G	890 V	1370 V

8. ANSI/IEEE Cat. B3/C1 Let Through Voltage – The let through voltage based on IEEE C62.41 and C62.45 recommended procedures for the ANSI/IEEE Cat. B3 ringwave (6000V, 3000A) shall be less than:

Modes	208Y/120	480Y/277
L-L	900V	1640V
L-G	550V	1050V
L-N, N-G	520 V	980 V

9. Each unit shall include an EMI/RFI filter. Filter shall comply with UL-1283.
10. Where practical, and to aid in keeping power lead/bus length short, Surge Protective Devices may be integrated into electrical distribution equipment enclosures.
11. In order to isolate the Surge Protective Devices under fault conditions, the assembly shall be U.L. rated for the same short circuit fault duty rating as the equipment to which it is connected. Provide supplemental fusing, if required, in order to meet this requirement. All overcurrent protection components shall be tested in compliance with UL 1449 – Limited Current Test and AIC Ratings.
12. Devices shall be provided with integral thermal protection to disconnect the suppression components during an overheated MOV condition.
13. Minimum Repetitive Surge Current Capability: The device shall be repetitive surge tested in every mode utilizing Category C3 waveshapes at minimum of one minute intervals without suffering either performance

degradation or more than 10% deviation of clamping voltage at a specified surge current. The minimum repetitive surge current capability as per ANSI/IEEE C62.41 and ANSI/IEEE C62.45 shall be:

- a. Service Entrance: 12,000 impulses per mode.
 - b. Branch Location (MCC's & Switchboards): 500 impulses per mode.
 - c. Branch Location Panelboard: 100 impulses per mode.
14. Voltage Protection Rating: The residual (limiting) voltage for a 6000V, 3000A, 8x 20µs surge waveform that the Surge Protective Device is capable of withstanding shall be no less than that shown in the following table:

Minimum total Surge Current and Withstand Capability with Compliance to ANSI/IEEE C62.41 and NEMA LS-1			
Application	Per Phase	Per Mode	Surge Withstand Capabilities ANSI/IEEE C3 Wave (10kA)
All Service Entrance Equipment (Switchgear, Switchboards, MCC's, and other S.E. listed equipment)	240 kA	120kA	12,000 events
Branch Locations (Non-S.E. MCC's & Switchboards)	120 kA	60 kA	500 events
Branch Locations (Non-S.E. Panelboards)	40 kA	20 kA	100 events

15. Lighting and Distribution Panelboard Requirements. The following additional requirements shall apply when drawings indicate that the Surge Protective equipment is to be integral to the panelboard and mounted within the enclosure housing.
- a. The Surge Protection units shall be tested to demonstrate suitability for ANSI/IEEE C62.41 Category C1 environments.
 - b. The Surge Protective Device shall not limit the use of Through-feed lugs, Sub-feed lugs and Sub-feed breaker features, where applicable.
 - c. The Surge Protective Device shall be immediately installed on the load side of the main breaker.
 - d. The panelboard shall be capable of re-energizing upon removal of the Surge Protective Device.
 - e. A direct bus bar connections shall be used to mount the Surge Protective component to the panelboard bus bar to reduce the impedance of the shunt path.
 - f. The Surge Protected panelboard shall be constructed using a direct bus bar connection.
 - g. The surge Protective Device shall be included and mounted within the panelboard by the manufacturer of the panelboard.
 - h. The complete panelboard, including the Surge Protection Device shall be UL-67 listed.
16. Switchgear, Switchboard, MCC and other Service Entrance equipment:

- a. The Surge Protection Devices covered under this section shall be 3rd party tested and suitable for ANSI/IEEE C62.41 Category C3 environments.
 - b. Surge Protection Device Nominal Discharge Current Rating: 20kA.
 - c. Then Surge Protection Device shall be located on the load side of the main disconnect device, as close as possible to the phase conductors and ground/neutral bar.
 - d. Provide a 30-amp disconnect (or manufacturers recommended size). The disconnect shall be directly integrated to the suppressor assembly.
 - e. Provide factory installed digital surge counter and form C dry-contact alarm that changes state if any of the three phases detect a faulted, open or other reduced protection condition.
 - f. All monitoring diagnostic features shall be visible from the front of the equipment.
- F. Control Panels (120 VAC Supply): All fabricated control panels utilizing 120 VAC power which house relays, timers or other electrical and electronic equipment shall be provided with Surge Protective Devices on the 120 VAC supply. This 120 VAC Surge Protective Device is in addition to any upstream three-phase Surge Protection units required elsewhere. Each 120 VAC Surge Protective Device unit shall include an isolated dry-contact "failure-alarm" for remote monitoring. Control Panel Surge Protective Devices units shall be Transtector ACP Model 100-BW3R, or equivalent. To permit remote monitoring, connect the "Alarm" dry-contact to a Programmable Logic Controller (PLC) Digital Input, if applicable on project.
- G. Instrumentation Signal Protection. All analog instrumentation 4 -20 ma signal cables which originate or terminate on an instrument installed on building exterior shall be individually protected with surge suppression at both ends of cable.
- 1. All Instrumentation Signal Surge Suppressors mounted within control panels shall be Transtector Model DRDC-24 (DIN Rail mount), or equivalent.
 - 2. All Instrumentation Signal Surge Suppressors mounted at field mounted equipment shall be ½" pipe nipple mount Transtector Model PDS-1 (dead-ended) or PDS-2 (thru-design), or equivalent.
- H. Surge Protection for DeviceNet Network:
On projects involving DeviceNet, or where shown on the drawings, provide UL-497B DeviceNet surge protection devices. Surge protection may be installed within DeviceNet equipment where practical. Where other enclosures are unavailable, provide suitably sized NEMA 4X Non-Metallic enclosure to house Surge Protection equipment. DeviceNet Surge Protection devices shall be Leviton Model #3863-DEV.
- I. Surge Protection for Ethernet Network:
On projects involving metallic-wire Ethernet which extends to building exterior, or where shown on the drawings, provide UL-497B Ethernet surge protection devices. Surge protection may be installed within other Ethernet equipment, Local Control Panels or PLC enclosures, whichever best suits particular project networking architecture and equipment. Where other enclosures are unavailable,

provide suitably sized NEMA 4X Non-Metallic enclosure to house Surge Protection equipment. Ethernet Surge Protection devices shall be furnished with standard RJ-45 Input and Output jacks. Ethernet Surge Protection devices shall be Leviton Model #3861-ETH.

PART 3 EXECUTION

3.01 EXAMINATION (RESERVED)

3.02 PREPARATION (RESERVED)

3.03 INSTALLATION

- A. Control panel surge protection shall be installed per manufacturer's instructions by panel builder prior to shipment.
- B. Surge protection equipment for all other locations shall be installed per manufacturer's instructions and requirements.

END OF SECTION 16671

DIVISION 16 – ELECTRICAL
Section 16950 – Testing Electrical Systems

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions on Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.
- B. Contractor shall note that this section shall be considered a Supplement to testing requirements outlined or described in other sections of these specifications.

1.02 WORK INCLUDES

- A. Extent of Work as required by the Drawings and these Specifications

1.03 RELATED WORK

- A. Specified elsewhere:
 - 1. Section 16010 - General Electrical Requirements
 - 2. Section 16123 - Building Wire and Cable
 - 3. Section 16160 - Cabinets and Enclosures
 - 4. Section 16170 - Grounding and Bonding
 - 5. Section 16441 - Enclosed Switches

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements
 - 1. Governing Codes:
 - a. NFPA 70 – National Electrical Code (most current issue)

1.05 SUBMITTALS

- A. Submit under provisions of Division 1.
 - 1. Test Reports:
 - a. Test of entire electrical system as noted herein. Submit to the Engineer in triplicate.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Furnish all equipment, tools, manpower, and labor to perform specified testing.

PART 3 EXECUTION

3.01 TESTING

- A. After wires and cables are in place and connected to devices and equipment, the system shall be tested for short circuits, improper grounds, and other faults. When fault condition is present, the trouble shall be rectified, then re-tested. Where cable is found defective or damaged, it shall be removed and replaced in entirety; do not field repair. Cost for correction shall be considered incidental to the project.
- B. All wiring devices and electrical apparatus furnished under this contract, when ground or shorted on any integral "live" part, shall be removed and the trouble rectified by replacing all defective parts and materials. Cost of correction is considered incidental to the project.
- C. All feeder cables and other power distribution apparatus shall have a Megger resistance test conducted to determine that insulation resistance is not less than that recommended by the manufacturer, or as noted below.

Unless otherwise recommended by the manufacturer, insulation resistance testing shall meet or exceed the following on 600 Volt equipment utilizing 500 Volt resistance test instrument:

Conductors	50 Meg-Ohms
Motors.....	5 Meg-Ohms
Switchboards, MCC's and Panelboards	25 Meg-Ohms
Power Transformers	5 Meg-Ohms

- D. Contractor shall furnish all tests and shall provide all test equipment, meters, instruments, cable connections or apparatus necessary for performing tests as specified herein. All costs for testing shall be considered incidental to this item and will not be paid for separately.
- E. Examine connections to equipment for proper phase relationships. Rotate phase conductors as necessary in order to correct.
- F. All motors shall be tested under Article 16220. All motors shall be tested for correct direction of rotation. Run tests on all motors shall be tested for correct direction of rotation. Run tests on all motors and verify that proper overload devices have been installed. Coordinate this task with motor supplier.
- G. Testing of Ground System
 - 1. Each and all grounded cases and metal parts associated with electrical equipment shall be tested for continuity of connection with the ground bus system by the Contractor in the presence of the Engineer or his representative.
 - 2. All grounding electrode conductors brought in from the ground field shall be tested for satisfactory continuity and by resistance measurement between the electrical equipment ground bus and the ground field. The grounding path shall not exceed 0.010 ohms.

3. Each Ground Field shall be tested for resistance to earth a "three-terminal" or "fall-of-potential" test as described in IEEE Standard #81. As an alternate, a specially designed clamp-on instrument such as AEMC Model 3710 or 3730 may be used if found acceptable to the engineer. Based upon measured field data, the Contractor shall calculate the ground field resistance and furnish record copies to the Engineer and Owner for record. In no case shall the ground field resistance exceed 25 ohms. If the resistance is found to be higher than 25 ohms, one additional rod shall be driven with a minimum separation equal to the length of the ground rod used and connected in parallel with the rod under test.
4. Exterior ground field resistance testing shall not be measured during unusually wet weather and should be performed during normal weather and soil conditions. Any tests incorrectly performed or not performed to the satisfaction of the engineer will be repeated. Costs for all such re-testing shall be considered incidental to the project.
5. All specified maximums and minimums of this specifications must be met. Complete test records of all tests shall be made and shall show resistance values obtained and calculations of same, showing method of test and calculation.

3.02 CORRECTION OF DEFECTS

- A. When tests disclose any unsatisfactory workmanship or equipment furnished under this contract, correct defects and retest. Repeat tests until satisfactory results are obtained.
- B. When any wiring or equipment is damaged by tests, repair or replace such wiring or equipment. Test repaired items to ensure satisfactory operation.

END OF SECTION 16950

**Public Works Transfer Switch
One Line Diagram and Details**

FINAL PLANS
MARCH 2016

WENTZVILLE
PUBLIC WORKS
GENERATOR
INSTALLATION

OWNER

WENTZVILLE, MISSOURI

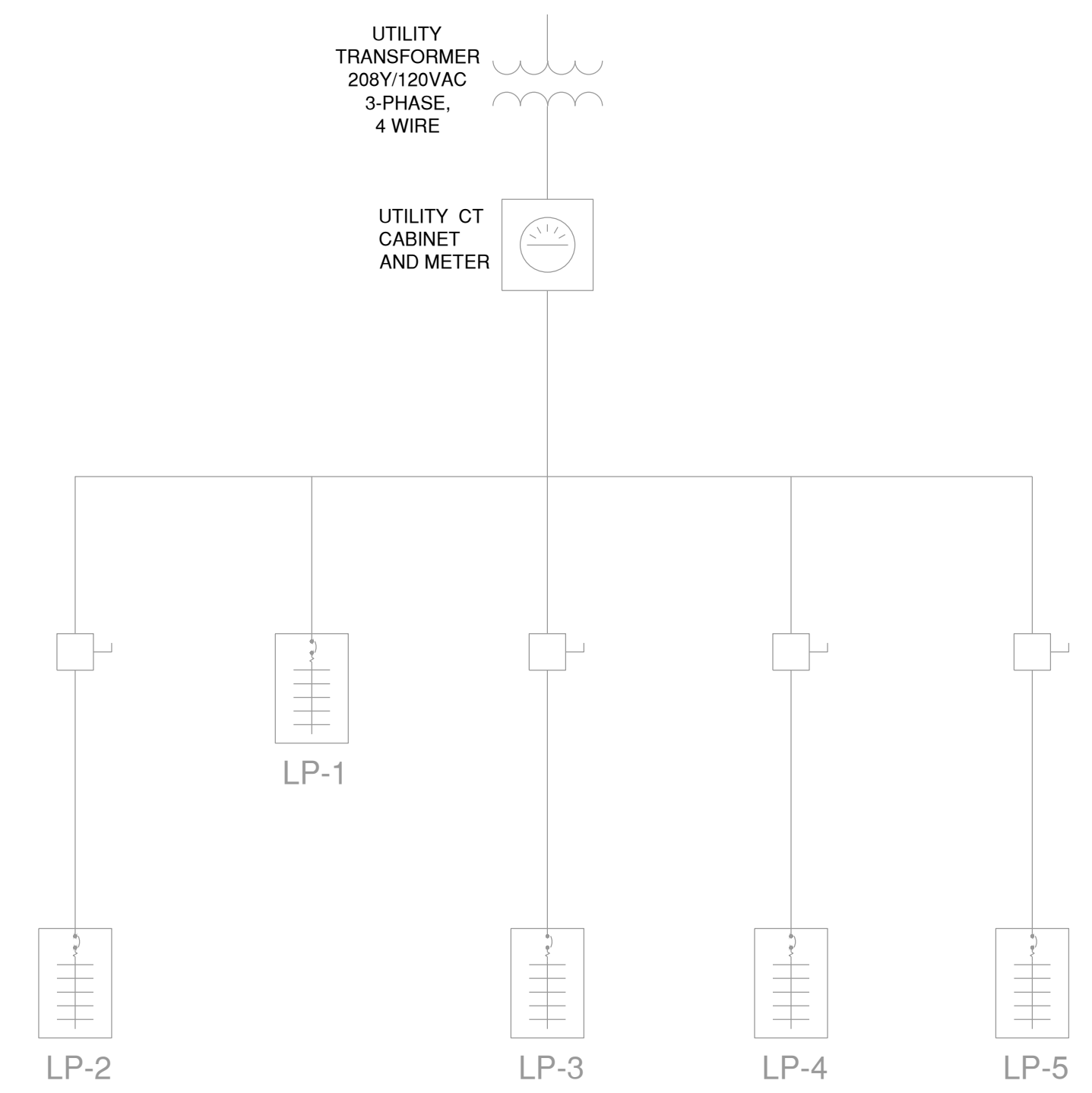
MARK	DATE	DESCRIPTION

PROJECT NO:	15436-05-00
CAD DWG FILE:	PUBLIC WORKS.DWG
DESIGNED BY:	JS8
DRAWN BY:	JS8
CHECKED BY:	AB
APPROVED BY:	RA
COPYRIGHT:	CRAWFORD, MURPHY & TILLY, INC. 2016

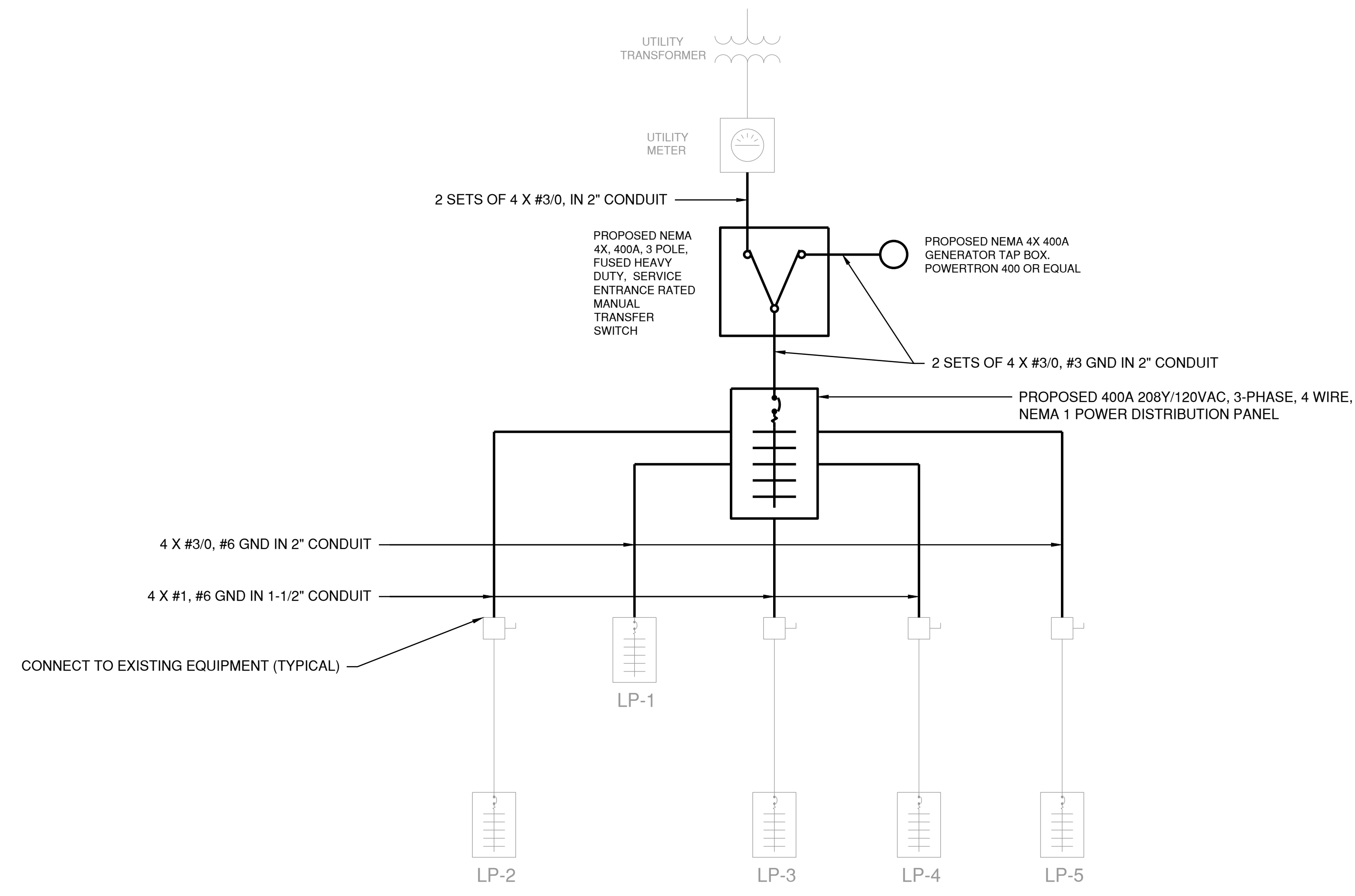
SHEET TITLE
**PUBLIC WORKS
ONE-LINES**

E-2

SHEET 2 OF XX



EXISTING ONE-LINE



PROPOSED ONE-LINE

GENERAL NOTES

- REMOVE EXISTING GROUNDING ELECTRODES FROM DISTRIBUTION SYSTEM AND EXTEND TO NEW MANUAL TRANSFER SWITCH. IF GROUNDING ELECTRODES ARE NOT PRESENT ADD 2/0 CONDUCTOR IN 1" PVC CONDUIT FROM THE MANUAL TRANSFER SWITCH TO THE BUILDING STRUCTURAL STEEL. USE EXOTHERMIC WELD TO SECURE TO STRUCTURAL STEEL. IF GROUND RODS ARE NOT PRESENT INSTALL THREE GROUND RODS IN A TRIANGLE SPACED MINIMUM 10 FEET APART. CONDUCTOR SHALL BE #6 IN 3/4" PVC CONDUIT. USE EXOTHERMIC WELD TO SECURE TO GROUND RODS. SEE GROUNDING AND BONDING SPECIFICATION FOR ADDITIONAL INFORMATION.
- ALL NEW WORK IS SHOWN IN BOLD. ALL EXISTING EQUIPMENT IS SHOWN FOR INFORMATION ONLY.

Path: J:\Wentzville\1543605\Eng. Design\Comp_est\Report\Drawing1.dwg
Date: Thursday, March 24, 2016 5:46:38 PM

ref CLIENT LOGO.dwg

GENERAL NOTES

- COORDINATE ANY POWER OUTAGES WITH OWNER. OUTAGES SHALL BE COORDINATED A MINIMUM OF TWO WORKING DAYS PRIOR TO LOSS OF SERVICE. NO OUTAGE SHALL LAST LONGER THAN 8 HOURS WITHOUT WRITTEN CONSENT FROM THE OWNER.
- INTERIOR CONDUIT MAY BE EMT. EXTERIOR CONDUIT SHALL BE GALVANIZED RIGID STEEL.
- CONTRACTOR SHALL MODIFY EXISTING SITE FENCING AND ASPHALT PAVING AS REQUIRED TO PROVIDE ADEQUATE SPACE FOR PORTABLE GENERATOR STAGING. VERIFY SITE CONDITIONS AND OWNERS GENERATOR EQUIPMENT DIMENSION PRIOR TO INSTALLING ANY EQUIPMENT ONSITE.
- IF ADDITIONAL SPACE IS REQUIRED FOR MOUNTING OF POWER DISTRIBUTION PANEL EXISTING DISCONNECT SWITCHES MAY BE REMOVED. PROPOSED CIRCUIT BREAKERS SHALL SERVICE AS DISCONNECTING MEANS FOR LOADS SERVED.
- DEPENDING ON OWNERS GENERATOR CORD LENGTH MANUAL TRANSFER SWITCH AND GENERATOR RECEPTACLE DENOTED BY KEYED NOTES 1 AND 2 MAY NEED TO BE REVERSED TO FACILITATE EASY GENERATOR HOOKUP. COORDINATE WITH OWNER PRIOR TO INSTALLATION.

KEYED NOTES

- GENERATOR RECEPTACLE. MOUNT ON EXTERIOR OF EXISTING STRUCTURE. CONTRACTOR SHALL UTILIZE GALVANIZED STEEL STRUT TO PROVIDE MINIMUM 1/2" AIR GAP. SYSTEM SHALL BE POWERTRON 400 OR EQUAL IN NEMA 3R ENCLOSURE.
- MANUAL TRANSFER SWITCH. MOUNT ON EXTERIOR OF EXISTING STRUCTURE. CONTRACTOR SHALL UTILIZE GALVANIZED STEEL STRUT TO PROVIDE MINIMUM 1/2" AIR GAP.
- SERVICE ENTRANCE POWER DISTRIBUTION PANEL. MOUNT ON INTERIOR OF EXISTING STRUCTURE. IF STRUT IS REQUIRED THE CONTRACTOR SHALL UTILIZE ALUMINUM OR STAINLESS STEEL.
- NEW 20A, GFCI RECEPTACLE WITH WEATHERPROOF WHILE IN USE COVER



PANELBOARD SCHEDULE																			
PANEL DESIGNATION: POWER DIST. PANEL				BOND NEUTRAL AND GROUND BAR: YES				POLE: 42											
LOCATION: PUBLIC WORKS INTERIOR				NEUTRAL BUS RATING: 100%				SHORT CIRCUIT RATING: 35KA											
MFR & TYPE:				SERVICE ENTRANCE RATED: YES				SERIES OR FULLY RATED: FULLY				TVSS & DISCONNECT REQUIRED: YES							
VOLTS: 208Y/120V				MOUNTING: SURFACE				BUS RATING (AMPS): 400											
PHASE: 3				ENCL RATING: NEMA 1				BUS: COPPER; SILVER OR TIN PLATED											
WIRE: 4				FED FROM: BOTTOM				MAIN CIRCUIT BREAKER: AMP/POLE 400/3											
CKT NO.	LOAD	BREAKER SIZE	LOAD AMPS	DIVERSITY FACTOR	PHASE AMPS (USAGE)			POLE NO.	PHASE AMPS (USAGE)			DIVERSITY FACTOR	LOAD AMPS	BREAKER SIZE	LOAD	CKT NO.			
					A	B	C		1	2	3								
1					0	0	0	1	2	0						2			
3	LP1	200/3						3	4	0				125/3	LP2	4			
5							0	5	6		0					6			
7							0	7	8	0						8			
9	LP3	125/3					0	9	10		0			125/3	LP4	10			
11							0	11	12		0					12			
13							0	13	14	0						14			
15	LP5	200/3					0	15	16		0			20/3	SPARE	16			
17							0	17	18		0					18			
19							0	19	20	0						20			
21	SPARE	20/3					0	21	22		0			20/3	SPARE	22			
23							0	23	24		0					24			
25							0	25	26	0						26			
27	SPARE	20/3					0	27	28		0			20/3	SPARE	28			
29							0	29	30		0					30			
31	RECEPTACLE	20/1					0	31	32	0				20/1	SPARE	32			
33	SPARE	20/1					0	33	34		0			20/1	SPARE	34			
35	SPARE	20/1					0	35	36		0			20/1	SPARE	36			
37	SPARE	20/1					0	37	38	0				20/1	SPARE	38			
39	SPARE	20/1					0	39	40		0			20/1	SPARE	40			
41	SPARE	20/1					0	41	42		0			20/1	SPARE	42			
SECTION TOTAL:					0	0	0		0	0	0								
MINIMUM MAIN CIRCUIT BREAKER AMPS:					0			PHASE TOTAL AMPS:			0 0 0			TOTAL USAGE LOAD:			0 VA		
								PHASE TOTAL VA:			0 0 0			MIN. XFMR VA:			0 VA		

NOTES:

 FINAL PLANS
MARCH 2016

 WENTZVILLE
PUBLIC WORKS
GENERATOR
INSTALLATION

OWNER

WENTZVILLE, MISSOURI

MARK DATE DESCRIPTION

 PROJECT NO: 15436-05-00
 CAD DWG FILE: PUBLIC WORKS.DWG
 DESIGNED BY: JSB
 DRAWN BY: JSB
 CHECKED BY: AB
 APPROVED BY: RA
 COPYRIGHT: CRAWFORD, MURPHY & TILLY, INC. 2016

 SHEET TITLE
**PUBLIC WORKS
ELECTRICAL PLAN**

E-2

SHEET X OF XX

Missouri

Division of Labor Standards

WAGE AND HOUR SECTION



JEREMIAH W. (JAY) NIXON, Governor

Annual Wage Order No. 23

Section 092

ST. CHARLES COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by

John E. Lindsey, Director
Division of Labor Standards

This Is A True And Accurate Copy Which Was Filed With The Secretary of State: March 10, 2016

Last Date Objections May Be Filed: April 11, 2016

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	** Date of Increase	*	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits
Asbestos Worker (H & F) Insulator			\$38.36	55	60	\$21.41
Boilermaker			\$32.76	126	7	\$30.10
Bricklayer and Stone Mason	6/16		\$32.50	72	5	\$21.80
Carpenter	6/16		\$36.98	77	41	\$16.30
Cement Mason	6/16		\$31.16	80	6	\$17.95
Communication Technician			\$31.35	44	47	\$9.53 + 31.75%
Electrician (Inside Wireman)	10/16		\$35.70	82	71	\$10.84 + 38.5%
Electrician (Outside-Line Construction/Lineman)	9/16		\$43.75	43	45	\$5.25 + 36%
Lineman Operator	9/16		\$37.73	43	45	\$5.25 + 36%
Groundman	9/16		\$29.11	43	45	\$5.25 + 36%
Elevator Constructor		a	\$46.04	26	54	\$31.645
Glazier			\$33.40	87	31	\$23.55
Ironworker			\$32.88	11	8	\$23.825
Laborer (Building):						
General			\$31.18	118	57	\$13.32
First Semi-Skilled			\$32.11	114	27	\$13.17
Second Semi-Skilled			\$31.17	5	3	\$13.17
Lather			USE CARPENTER RATE			
Linoleum Layer and Cutter	6/16		\$31.83	92	26	\$16.00
Marble Mason	6/16		\$31.83	76	51	\$14.62
Marble Finisher	6/16		\$26.42	76	51	\$13.95
Millwright			USE CARPENTER RATE			
Operating Engineer						
Group I	6/16		\$32.41	3	66	\$25.13
Group II	6/16		\$32.41	3	66	\$25.13
Group III	6/16		\$30.51	3	66	\$25.13
Group III-A	6/16		\$32.41	3	66	\$25.13
Group IV	6/16		\$27.05	3	66	\$25.13
Group V	6/16		\$27.05	3	66	\$25.13
Painter			\$31.65	104	12	\$13.76
Pile Driver			USE CARPENTER RATE			
Pipe Fitter	7/16		\$38.00	91	69	\$26.93
Plasterer	7/16		\$31.56	67	3	\$17.98
Plumber	7/16		\$38.00	91	69	\$26.93
Roofer \ Waterproofer			\$31.35	15	73	\$17.12
Sheet Metal Worker			\$39.63	32	25	\$21.72
Sprinkler Fitter - Fire Protection			\$41.56	66	18	\$22.02
Terrazzo Worker	6/16		\$32.30	116	5	\$13.79
Terrazzo Finisher			\$30.35	116	5	\$11.84
Tile Setter	6/16		\$31.83	76	51	\$14.62
Tile Finisher	6/16		\$26.42	76	51	\$13.95
Traffic Control Service Driver			\$28.775	22	55	\$9.045
Truck Driver-Teamster			\$30.41	35	36	\$10.82

Fringe Benefit Percentage is of the Basic Hourly Rate

**Annual Incremental Increase

ST. CHARLES COUNTY BUILDING CONSTRUCTION - OVERTIME SCHEDULE

FED: Minimum requirement per Fair Labor Standards Act means time and one-half (1 ½) shall be paid for all work in excess of forty (40) hours per work week.

NO. 3: Means the regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute lunch period, with pay at the straight time rate. The regular workday shall begin between the hours of 6:00 a.m. and 9:00 a.m. The Employer may have the option to schedule the work week from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be paid at the applicable overtime rate. If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather, holiday or other conditions beyond the control of the Employer, they shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours for the workweek. All overtime work performed on Monday through Saturday shall be paid at time and one-half (1½) the hourly rate plus an amount equal to one-half (½) of the hourly Total Indicated Fringe Benefits. All work performed on Sundays and recognized holidays shall be paid at double (2) the hourly rate plus an amount equal to the hourly Total Indicated Fringe Benefits. Shifts may be established when considered necessary by the Employer. Shift hours and rates will be as follows. If shifts are established, work on the First Shift will begin between 6:00 a.m. and 9:00 a.m. and consist of eight (8) hours of work plus one-half hour unpaid lunch. Hours worked during the first shift will be paid at the straight time rate of pay. The second shift shall start eight hours after the start of the first shift and consist of eight (8) hours of work plus one-half hour unpaid lunch. Work on the second shift will begin between 2:00 p.m. and 5:00 p.m. and be paid the straight time rate plus \$2.50 per hour. The third shift shall start eight hours after the start of the second shift and consist of eight (8) hours plus one-half hour unpaid lunch. Work on the third shift will begin between 10:00 p.m. and 1:00 a.m. and be paid the straight time rate plus \$3.50 per hour. The additional amounts that are to be paid are only applicable when working shifts. Shifts that begin on Saturday morning through those shifts which end on Sunday morning will be paid at time and one-half these rates. Shifts that begin on Sunday morning through those shifts which end on Monday morning will be paid at double time these rates.

NO. 5: Means eight (8) hours shall constitute the regular workday between the hours of 6:00 a.m. and 5:30 p.m., except when the Employer elects to work four 10-hour days as described below. The starting time of the workday can be adjusted from 6:00 a.m. to 9:00 a.m. The Employer may have the option to schedule his workweek from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate. If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), he shall have the option to work Friday at the straight time rate of pay to complete his forty (40) hours. However, should a holiday occur, Monday through Thursday, the Employer shall have the option to work Friday at the straight time rate of pay to complete his forty (40) hours. Time and one-half (1½) shall be paid for work performed in excess of eight (8) hours on any regular workday or outside the hours limiting a regular workday, Monday through Friday. Time and one-half (1½) shall be paid for work performed on Saturdays. Double (2) time shall be paid for work performed on Sundays and recognized holidays. Overtime shall be computed at one-half (½) hour intervals. **Projects that cannot be performed during regular workday:** Where specifications issued by governmental agencies require work to be performed outside the regular workday, the starting time will begin when the employee starts to work. The employee shall be paid applicable straight time hourly wage plus a premium of (\$2.50) per hour for the first eight (8) hours worked. Any hours worked in excess of eight (8) hours shall be paid at the applicable overtime rate. **Shift work:** Shifts may be established when necessary by the Employer. Shifts shall be established for a minimum of three (3) consecutive workdays. The first shift will be paid at eight (8) hours straight time pay for eight (8) hours worked. The second shift will be paid at eight (8) hours straight time pay plus a two dollar and fifty cent (\$2.50) per hour premium for eight (8) hours work. The third shift will be paid at eight (8) hours straight time pay plus a three dollar and fifty cent (\$3.50) per hour premium for eight (8) hours work. Payment for shift work shall be determined when an Employer first begins his shift operation, i.e., the shifts which begin on Friday morning and end on Saturday morning will be paid straight time; the shifts which start on Saturday morning and end on Sunday morning will be paid at time and one-half (1½); the shift that start on Sunday morning and end on Monday morning will be paid at two (2) times the regular rate of pay. Employees working during the normal workday shall receive first shift pay; employees working predominantly during the evening hours shall receive second shift pay; employees working predominately during the early morning hours will receive third shift pay. Nothing above prohibits the working of two (2) shifts greater than eight (8) hours with excess hours to be paid at overtime rate.

NO. 11: Means eight (8) hours shall constitute a day's work, with the starting time to be established between 6:00 a.m. and 8:00 a.m. from Monday to Friday. Time and one-half (1½) shall be paid for first two (2) hours of overtime Monday through Friday and the first eight (8) hours on Saturday. All other overtime hours Monday through Saturday shall be paid at double (2) time rate. Double (2) time shall be paid for all time on Sunday and recognized holidays or the days observed in lieu of these holidays.

**ST. CHARLES COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE**

NO. 15: Means the regular working day shall be scheduled to consist of at least eight (8) hours, but no more than ten (10) consecutive hours, exclusive of the lunch period. The regular working day may be scheduled to commence at any time between the hours of 5:00 a.m. and 10:00 a.m. All work performed in excess of forty (40) hours in one work week, or in excess of ten (10) hours in one work day shall be paid at the rate of one and one-half (1½) times the regular hourly wage scale. Any work performed on a Saturday shall be paid for at the rate of one and one-half (1½) times the regular hourly wage scale unless such Saturday work falls under the category of Saturday Make-Up Day. Any work performed by Employees anywhere on Sunday or recognized holidays, shall be paid for at the rate of double (2) time the regular wage scale. If, during the course of a work week, an Employee is unable to work for any reason, and, as a result, that Employee has not accumulated forty (40) hours of compensable time at the straight time rate, the Employer, at his option may offer the Employee the opportunity to work on Saturday at straight time; provided, however, if during the period worked by said Employee on Saturday, the Employee's compensable time at the straight time rate exceeds forty (40) hours, all time worked in excess of the forty (40) hours will be paid at the rate of one and one-half (1½) times the regular hourly wage scale.

NO. 22: Means a regular work week of forty (40) hours will start on Monday and end on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof may be worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A workday is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time may be advanced or delayed if mutually agreed to by the interest parties. For all time worked on recognized holidays, or days observed as such, double (2) time shall be paid.

NO. 26: Means that the regular working day shall consist of eight (8) hours worked between 6:00 a.m., and 5:00 p.m., five (5) days per week, Monday to Friday, inclusive. Hours of work at each jobsite shall be those established by the general contractor and worked by the majority of trades. (The above working hours may be changed by mutual agreement). Work performed on Construction Work on Saturdays, Sundays and before and after the regular working day on Monday to Friday, inclusive, shall be classified as overtime, and paid for at double (2) the rate of single time. The employer may establish hours worked on a jobsite for a four (4) ten (10) hour day work week at straight time pay for construction work; the regular working day shall consist of ten (10) hours worked consecutively, between 6:00 a.m. and 6:00 p.m., four (4) days per week, Monday to Thursday, inclusive. Any work performed on Friday, Saturday, Sunday and holidays, and before and after the regular working day on Monday to Thursday where a four (4) ten (10) hour day workweek has been established, will be paid at two times (2) the single time rate of pay. The rate of pay for all work performed on holidays shall be at two times (2) the single time rate of pay.

NO. 32: The regular working day shall consist of eight (8) hours of labor on the job between six (6) a.m. and four (4) p.m. and the regular working week shall consist of five (5) consecutive eight (8) hour day's of labor on the job beginning with Monday and ending with Friday of each week. The normal work week is 40 hours. All full-time or part-time labor performed during such hours shall be recognized as regular working hours and paid for at the regular hourly rate. **All work performed during regular work hours on Saturdays will be paid at time and one-half (1 ½).** All work performed outside of regular working hours and performed during the regular work week, shall be at double (2) times the regular rate, except that the first two (2) hours following the regular work day shall be paid at one and one-half (1½) times the regular rate. An early starting time of 6:00 a.m. may be used mutually agreed upon by the interested parties. **SHIFT RATE:** Shift work would start after 4:00 p.m. to 6:00 a.m. The first 8 hours would be at 115% of the basic wage rate. Overtime Monday through Friday would be at 1 ½ of base shift rate. Saturday regular work day hours – 1½ of base shift rate. Saturday – work after 8 hours – 2 times the basic wage rate. Sunday and Holidays – 2 times the basic wage rate. ~~All work performed on recognized holidays and Sundays shall be paid double (2) time. Appropriate overtime rates to be based on fifteen minute increments.~~

NO. 35: Means a regular work week of forty (40) hours, will start on Monday and end on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof maybe worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A work day is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time maybe advanced or delayed if mutually agreed to by the interested parties. For all time worked on recognized holidays, or days observed as such, double (2) time shall be paid.

ST. CHARLES COUNTY BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 43: Eight (8) hours shall constitute a work day between the hours of 7:00 a.m. and 4:30 p.m. Forty (40) hours within five (5) days, Monday through Friday inclusive, shall constitute the work week. Work performed in the 9th and 10th hour, Monday through Friday, shall be paid at time and one-half (1½) the regular straight time rate of pay. Contractor has the option to pay two (2) hours per day at the time and one-half (1½) the regular straight time rate of pay between the hours of 6:00 a.m. and 5:30 p.m., Monday through Friday. Work performed outside the regularly scheduled working hours and on Saturdays, Sundays and recognized legal holidays, or days celebrated as such, shall be paid for at the rate of double (2) time.

NO. 44: Means forty (40) hours shall constitute a work week, Monday through Friday. Eight (8) hours shall constitute a work day. Hours of work shall be between the hours of 7:00 a.m. and 4:30 p.m. All work performed before 7:00 a.m. and after 4:30 p.m. and all work performed in excess of eight (8) hours in any one work day, over forty (40) hours in any work week and the first eight (8) hours of work on Saturday, shall be paid at the rate of one and one-half (1½) times the regular rate of pay. All hours worked in excess of eight (8) hours on Saturday, all hours worked on Sunday and on holidays, or days that may be celebrated as such, and as designated by the federal government, shall be paid at two (2) times the regular rate of pay. All shifts for work performed between the hours of 4:30 p.m. and 1:00 a.m. shall receive eight (8) hours pay at the regular hourly rate of pay plus two dollars (\$2.00) per clock hour. All work performed between the hours of 12:30 a.m. and 9:00 a.m. on a third shift shall receive eight (8) hours pay at the regular hourly rate plus four dollars (\$4.00) per clock hour. All overtime work required after the completion of a regular shift shall be paid at one and one-half times (1½ x) the "shift" hourly rate.

NO. 55: Means the regular work day shall be eight (8) hours between 6:00 a.m. and 4:30 p.m. The first two (2) hours of work performed in excess of the eight (8) hour work day, Monday through Friday, and the first ten (10) hours of work on Saturday, shall be paid at one & one-half (1½) times the straight time rate. All work performed on Sunday, observed holidays and in excess of ten (10) hours a day, Monday through Saturday, shall be paid at double (2) the straight time rate.

NO. 66: Means eight (8) hours shall constitute a day's work beginning at 7:00 a.m. (or 8:00) A.M. and ending at 3:30 (or 4:30) P.M. The work week shall be forty (40) hours beginning Monday at 7:00 a.m. (or 8:00) A.M. and ending Friday at 3:30 (or 4:30) P.M. The Employer at his option may use a flexible starting time between the hours of 6:00 a.m. and 8:00 a.m. All overtime, that is worked outside of the above established working hours of Monday through Friday, shall be paid at double (2) time, including Saturdays, Sundays and Holidays.

NO. 67: Means eight (8) hours shall constitute a day's work, with a flexible starting time to begin between 6:00 a.m. to 8:00 a.m., five (5) days a week, Monday through Friday. Any work over eight (8) hours in any one day shall be at the overtime rate, which is time & one-half (1½). Any work on Saturday shall be at time & one-half (1½), unless a Make-Up Day due to inclement weather is in effect. Any work on Sundays or holidays shall be at double (2) time. Four (4) days, ten (10) hours each day to be worked during Monday through Friday, shall be paid at straight time. A Make-Up Day Due To Inclement Weather Only - Employee(s) will be permitted to work an eight (8) hour make-up day on Saturday only, and the employee will receive the regular straight time wage rate.

NO. 72: Means that except as is otherwise provided herein, the work week shall be determined to begin at 8:00 a.m. Wednesday and end at 4:30 p.m. on the following Tuesday. Except as herein provided, working hours are from 8:00 a.m. to 11:55 a.m. and 12:30 p.m. to 4:25 p.m. and no more than the regular hours shall be worked during the forenoon or afternoon at the regular rate. In the case of days of inclement weather starting time and quitting time may be adjusted so long as the hours worked on such days do not exceed eight (8) and do not extend beyond 4:30 p.m. In circumstances where the Employee or Employees have regularly been working overtime on a particular day or days, no adjustment in the starting time shall operate to deprive Employees of overtime pay, which they would have otherwise received but for the change in the starting time. The parties understand that the application of the provisions of the preceding sentence will result in Employees receiving overtime pay even where they have not worked more than with (8) hours on a particular day. Regardless of the starting time, the forenoon working hours shall end at 11:55 a.m. and the afternoon working hours shall begin at 12:30 p.m. and end 8 hours and 25 minutes after the starting time fixed by the Employer for forenoon hours. Work performed by an employee on a non-holiday Saturday, except as hereinafter provided, or at night or before or after regular working hours on a non-holiday weekday, shall be considered overtime work, for which Employees working during such time shall be paid at the rate of one and one-half (1½) times their regular hourly wage rate for each hour or fraction thereof, worked during such time. Work performed on a Sunday or the recognized holidays shall be considered overtime work for which the Employee shall be paid twice the amount of his or her regular hourly wage rate for each hour or fraction thereof worked on any such day.

ST. CHARLES COUNTY BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 76: Means the standard workday shall consist of eight (8) hours of work between the hours of 8:00 a.m. and 4:30 p.m. with a thirty (30) minute unpaid lunch hour occurring in the middle of the shift. The standard workweek shall consist of five standard workdays commencing on Monday and ending on Friday. The normal starting and quitting times may be changed by mutual consent of interested parties. All time worked before and after the established eight (8) hour workday, Monday through Friday, and all time worked on Saturday, shall be paid for at the rate of time & one-half (1½) the hourly base wage rate in effect. All time worked on Sunday and holidays shall be paid at the rate of double (2) the hourly wage in effect. All work done on Saturday will be done at time & one-half (1½), unless Saturday shall be used as a make-up day. If an employee should lose one or more days in a work week and use Saturday as a make-up day the pay shall be at the regular hourly base wage rate and benefits.

NO. 77: Means the regular workday shall consist of eight (8) consecutive hours, exclusive of a thirty (30) minute lunch period, with pay at the regular straight time hourly rate. The regular workday shall begin on the job site between the hours of 6:00 a.m. and 8:00 a.m. with the starting time to be determined by the Employer, unless project owner requires different starting time. This adjustable starting time can, at the Employer's option, be staggered to permit starting portions of the work force at various times within the prescribed hours. The Employer may establish a four (4) ten (10) hour shift exclusive of the thirty (30) minute lunch period at the straight time wage rate. Forty (40) hours per week shall constitute a week's work Monday through Thursday. In the event a job is down due to weather conditions, safety or other conditions beyond the control of the Employer, then Friday may, at the option of the employer, be worked as a make-up day at the straight time wage rate. Straight time is not to exceed ten (10) hours a day or forty (40) hours per week. Time and one-half (1 ½) shall be paid for all overtime hours worked during the week, Monday through Friday and for all work performed on Saturday. Double (2) time shall be paid for all time worked on Sunday and recognized holidays.

NO. 80: Means eight (8) hours shall constitute the regular work day and forty (40) hours a work week, Monday through Friday. The Employer shall establish the starting time between 6:30 a.m. through 9:00 a.m. An Employer may further adjust the starting time up to 9:30 a.m. throughout the year. Time and one-half (1½) shall be paid after eight (8) consecutive hours worked after the established starting time and for hours worked before the established starting time. Time and one-half (1½) shall be paid for work performed on Saturdays. Work performed on Sundays and Holidays shall be paid at the double (2) time rate of pay. The Employer when working on Highway and Road Work may have the option to schedule the work week for his paving crew only from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate of time and one-half (1½). If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), the Employer shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours.

NO. 82: Means the work day shall consist of eight (8) hours worked between 7:00 a.m. and 4:30 p.m. Forty (40) hours will constitute the work week from Monday through Friday, inclusive. Up to four (4) hours of overtime work per day performed before or after the assigned normal work day, (twelve (12) continuous hours, starting no earlier than 6:00 a.m., Monday through Friday), shall be paid at a rate of one and one-half times (1.5x) that employee's hourly rate. Any additional overtime, Monday through Friday, shall be paid at two times (2x) the regular rate of pay. The first eight hours of overtime work on Saturday shall be paid at the rate of one and one-half times (1.5x) the regular rate of pay. Hours worked in excess of eight (8) hours on Saturday shall be paid at two times (2x) the regular rate of pay. Double time shall be paid for work performed on Sundays, recognized legal holidays or days that may be celebrated as such as designated by the federal government. All shifts for work performed between the hours of 4:30 p.m. and 1:00 a.m. shall be paid at the regular hourly rate plus two dollars (\$2.00) per clock hour. All shifts for work performed between the hours of 12:30 a.m. and 9:00 a.m. shall be paid at the regular hour rate plus four dollars (\$4.00) per clock hour. ~~All overtime work required after the completion of a regular shift shall be paid at one and one-half times (1.5x) the "shift" hourly rate.~~

NO. 87: Means eight (8) hours starting between 6:00 a.m. and 8:00 a.m. and ending between 2:30 p.m. and 4:30 p.m. at the Employers discretion shall constitute a day's work. Any work prior to 6:00 a.m. or after eight (8) hours shall be paid at the overtime rate. Five (5) days from Monday through Friday inclusive shall constitute a regular work week. All hours before and after these regular hours shall be considered overtime and shall be paid for at the rate of double (2) time. All work on Saturday and Sunday shall be paid at double (2) the prevailing scale of wages.

ST. CHARLES COUNTY BUILDING CONSTRUCTION - OVERTIME SCHEDULE

NO. 91: Means eight (8) hours shall constitute a day's work commencing at 7:00 a.m. and ending at 3:30 p.m., allowing one-half (½) hour for lunch. The option exists for the Employer to use a flexible starting time between the hours of 6:00 a.m. and 9:00 a.m. The regular workweek shall consist of forty (40) hours of five (5) workdays, Monday through Friday. The workweek may consist of four (4) ten (10) hour days from Monday through Thursday, with Friday as a make-up day. If the make-up day is a holiday, the employee shall be paid at the double (2) time rate. The employees shall be paid time and one-half (1½) for work performed on Saturdays, before the regular starting time or after the regular quitting time or over eight (8) hours per work day (unless working a 10-hour work day, then time and one-half (1½) is paid for work performed over ten (10) hours a day) or over forty (40) hours per work week. Work performed on Sundays and recognized holidays shall be paid at the double (2) time rate of pay. **SHIFT WORK:** When it is necessary for the project to operate in shifts, there will be three (3) eight (8) hour shifts commencing at 8:00 a.m. Shift work must continue for a period of not less than three (3) consecutive work days, two (2) days which must be regular work days (Monday through Friday). In the event the second or third shift of any regular work day shall fall into a Saturday or a holiday, such extension into a Saturday or holiday shall be considered as part of the previous workday and employees shall be paid at the regular shift rate. The first day shift shall work a regular eight (8) hour day at regular rates. The second shift shall be eight (8) hours regular time pay plus \$2.50 per hour premium for eight (8) hours work. Third shift will be for eight (8) hours regular time pay plus \$3.00 per hour premium for eight (8) hours work.

NO. 92: Means all work performed from 8:00 a.m. to 4:30 p.m., Monday through Friday, will be at straight time pay up to forty (40) hours per week. All work performed Monday through Friday before 8:00 a.m. and after 4:30 p.m. will be done at time and one-half (1½). All work done on Saturday will be done at time and one-half (1½), unless the employer and employee agree that Saturday shall be used as a make-up day. The Employer may use a flexible starting time of 7:00 a.m. to 8:00 a.m., and quitting time of 3:30 p.m. to 4:30 p.m., and any such different work starting time shall determine whether wages are payable at the straight rate or the premium rate. All work performed on Saturday shall be paid for at time and one-half (1½), unless the Saturday has been used as a make-up day. All work performed on Sunday and holidays shall be paid for at the rate of double (2) time.

NO. 104: Means eight (8) hours per day shall constitute a standard work day between the hours of 6:00 a.m. and 8:00 p.m. The standard work week shall be forty (40) hours between 6:00 a.m. on Monday and ending 8:00 p.m. on Friday. An overtime rate of time and one-half (1½) the base hourly rate shall be paid on all hours in excess of eight (8) hours in a day Monday through Friday. Saturdays shall be considered overtime and work done on Saturday shall be paid at time and one-half (1½) the prevailing scale. Sundays and holidays shall be considered overtime and work done on these days shall be paid at double (2) the prevailing scale.

NO. 114: Means eight (8) hours shall constitute a regular work day between the hours of 7:00 a.m. and 5:30 p.m. with a thirty (30) minute lunch period to start between the hours of 11:00 a.m. and 1:00 p.m. Five (5) days shall constitute a regular work week commencing on Monday and ending on Friday. One and one-half (1½) times the regular hourly rate of pay shall be paid for all overtime work, with the exception of holidays or Sundays. Overtime work shall be deemed to include any work performed in excess of eight (8) hours on any day in the regular work week, or any work performed before 7:00 a.m. or after 5:30 p.m. on any day in the regular work week. If a crew is prevented from working forty (40) hours Monday through Friday by reason of inclement weather, then Saturday may be worked by that crew as a make-up day at the straight time rate. Double (2) time shall be paid for work performed on Sundays and holidays, or days observed as such. **Shift Work:** In the case of three (3) shifts, workmen shall be paid eight (8) hours for seven and one-half (7½) hours worked.

NO. 116: Means the standard work day shall consist of eight (8) hours of work between the hours of 8:00 a.m. and 4:30 p.m. The standard work week shall consist of five standard work days commencing on Monday and ending on Friday inclusive. All time worked before and after the established eight (8) hour work day, Monday through Friday, and all time worked on Saturdays, shall be paid for at the rate of time & one-half (1½) the hourly base wage rate in effect. All time worked on Sundays and recognized holidays shall be paid for at the rate of double (2) the hourly base wage rate in effect.

**ST. CHARLES COUNTY
BUILDING CONSTRUCTION - OVERTIME SCHEDULE**

NO. 118: Means eight (8) hours shall constitute the regular work day, between the hours of 6:00 a.m. and 5:30 p.m. except when the Employer elects to work four (4) ten (10) hour days as described below. The starting time of the workday can be adjusted from 6:30 a.m. to 9:00 a.m. The Employer may have the option to schedule his work week from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate. If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), or other conditions beyond the control of the Employer, the Employer shall have the option to work Friday at the straight time rate of pay to complete his forty (40) hours. However, should a holiday occur, Monday through Thursday, the Employer shall have the option to work Friday at the straight time rate of pay to complete his forty (40) hours. Time and one-half (1½) shall be paid for work performed in excess of eight (8) hours on any regular work day or outside the hours limiting a regular work day. Straight time is not to exceed ten (10) hours a day or forty (40) hours per week. When an Employer works a project on a four (4) ten (10) hour day work schedule, the Employer will not bring in any other crew for a fifth workday on the project while not calling in the normal crew that had been scheduled for that project. Time and one-half (1½) shall be paid for work performed on Saturdays. Double (2) time shall be paid for work performed on Sundays and recognized holidays. Overtime shall be computed at one-half (1/2) intervals. Projects that cannot be performed during regular workday: If required by owner, the contractor may perform work outside the normal work hours and employees shall be paid applicable straight time hourly wage rate plus a premium of one dollar and fifty cents (\$1.50) per hour for the first eight (8) hours worked. Any hours worked in excess of eight (8) hours shall be paid at the applicable overtime rate plus the one dollar and fifty cent (\$1.50) per hour premium. The overtime rate shall be computed after the \$1.50 premium has been added to the hourly wage rate. However, if a contractor employs any other craft on a project being worked outside the normal workday, and is paying the other craft a higher premium, then the Laborers employed by such contractor on such project outside the normal work hours shall be paid the higher premium. Shift work: Shifts may be established when necessary by the Employer. Shifts shall be established for a minimum of three (3) consecutive workdays. The first shift will be paid at eight (8) hours straight time pay for eight (8) hours work. The second shift will be paid at eight (8) hours straight time pay plus a thirty-five cent (\$.35) per hour premium for seven and one-half (7½) hours work. The third shift will be paid at eight (8) hours straight time pay plus a forty-cent (\$.40) per hour premium for seven (7) hours work. Overtime is computed after the premium has been added to the hourly wage rate. Nothing above prohibits the working of two (2) shifts greater than eight (8) hours with excess hours to be paid at overtime rate.

NO. 126: Means eight (8) hours per day shall constitute a day's work and forty (40) hours per week, Monday through Friday, shall constitute a week's work. The regular starting time shall be 8:00 a.m. If a second or third shift is used, the regular starting time of the second shift shall be 4:30 p.m. and the regular starting period for the third shift shall be 12:30 a.m. These times may be adjusted by the employer. The day shift shall work a regular eight (8) hours shift as outlined above. Employees working a second shift shall receive an additional \$0.25 above the regular hourly rate and perform seven and one-half (7½) hours work for eight (8) hours pay. Third shift employees shall be paid an additional \$0.50 above the regular hourly rate and work seven (7) hours for eight (8) hours pay. When circumstances warrant, the Employer may change the regular workweek to four (4) ten-hour days at the regular time rate of pay. All time worked before and after the established workday of eight (8) hours, Monday through Friday, and all time worked on Saturday shall be paid at the rate of time and one-half (1½) except in cases where work is part of an employee's regular Friday shift. All time worked on Sunday and recognized holidays shall be paid at the double (2) time rate of pay except in cases where work is part of an employee's previous day's shift. For all overtime hours worked \$27.96 of the fringe benefits portion of the prevailing wage shall be paid at the same overtime rate at which the cash portion of the prevailing wage is to be paid. The remaining \$1.24 of the fringe benefit portion of the prevailing wage may be paid at straight time.

**ST. CHARLES COUNTY
HOLIDAY SCHEDULE – BUILDING CONSTRUCTION**

NO. 3: All work done on New Year's Day, Decoration Day, July 4th, Labor Day, Veteran's Day, Thanksgiving and Christmas shall be compensated at the double (2) time rate of pay. When any of these holidays fall on a Sunday, the following Monday shall be observed.

NO. 5: All work that shall be done on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day shall be paid twice the amount of his or her regular hourly wage rate for each hour of fraction thereof worked on any such day .

NO. 6: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veterans Day, Thanksgiving Day, Christmas Day and any additional holidays which may be mutually agreed upon. Whenever any such holiday falls on a Sunday, the following Monday shall be recognized and observed as the holiday. Work performed on Sundays and holidays shall be paid at the double time rate of pay. No work shall be performed on Labor Day.

NO. 7: The following days are assigned days and are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. If a holiday falls on a Saturday, it shall be observed on the preceding Friday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This is applied to protect Labor Day. When a holiday falls during the normal workweek, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week. However, no reimbursement for these eight (8) hours is to be paid to the workman unless worked. If workman are required to work the above enumerated holidays or days observed as such, or on Sunday, they shall receive double (2) the regular rate of pay for such work.

NO. 8: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day, or the days observed in lieu of these holidays, shall be paid at the double time rate of pay.

NO. 12: All work done on New Year's Day, Decoration Day, Independence Day, Veteran's Day, Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. Should any of these days fall on Sunday, then the following day shall be observed as the holiday. Under no circumstances shall employees be permitted to work on Labor Day.

NO. 18: All work done on New Year's Day, Memorial Day, July 4th, Labor Day, Veteran's Day, Thanksgiving Day, the Friday following Thanksgiving and Christmas Day shall be paid at the double time rate of pay. When one of the above holidays falls on Sunday, the following Monday shall be considered the holiday, and when one of the above holidays falls on Saturday, the preceding Friday shall be considered the holiday, and all work performed on said day(s) shall be paid at the double time rate.

NO. 25: All work done on New Year's Day, Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving, Christmas Day, Presidential Election Day, or days locally observed as such, and Saturday and Sunday shall be recognized as holidays and shall be paid at the double (2) time rate of pay. If a named holiday falls on a Saturday, the holiday will be observed on the preceding Friday. When a named holiday falls on Sunday, the Monday after will be observed as the holiday. Appropriate overtime rates to be based on fifteen minute increments.

NO. 26: All work done on New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. When a Holiday occurs on Saturday it shall not be observed on either the previous Friday or the following Monday. Such days shall be regular work days. If such a holiday occurs on Sunday it shall be observed on the following Monday.

NO. 27: All work done on the following holidays or days observed as such shall be paid at the double time rate of pay: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day.

ST. CHARLES COUNTY HOLIDAY SCHEDULE – BUILDING CONSTRUCTION

NO. 31: All work done on New Year's Day, Presidents Day, Good Friday, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, Friday after Thanksgiving Day, Christmas Day, and Employee's Birthday shall be paid at the double time rate of pay. If a holiday falls on Sunday, the following Monday will be observed as the recognized holiday. If a holiday falls on Saturday, the preceding Friday will be observed as the recognized holiday.

NO. 36: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workman unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make-up day when an observed holiday occurs during the work week. Employees have the option to work that make-up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 41: The following days shall be observed as legal holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day. No work shall be performed on the Fourth of July, Labor Day or Christmas Day. Any work performed on the above holidays shall be paid for at two (2) times the regular straight time rate of pay. When any of the above holidays fall on Sunday, the following Monday shall be observed as such holiday. If a holiday falls on Saturday, it shall not be considered to be observed on the previous Friday or following Monday. Such days shall be regular workdays.

NO. 45: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving, the day before Christmas, and Christmas Day, shall be paid at the double time rate of pay.

NO. 47: The following holidays are recognized: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, the day after Thanksgiving and Christmas Day. When a holiday listed above falls on Saturday, it shall be celebrated on the Friday preceding the holiday. When a holiday falls on Sunday, the following Monday shall be observed. Holidays referred to above shall be paid for at the double (2) time rate of pay when worked.

NO. 51: All time worked on Sundays and recognized holidays shall be paid for at the rate of double (2) the hourly base wage rate in effect. The Employer agrees to recognize the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day. If the holiday falls on Sunday, it shall be recognized on the following Monday. If the holiday falls on a Saturday, it shall be recognized as a Saturday only holiday.

NO. 54: All work performed on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, the Friday after Thanksgiving Day, and Christmas Day shall be paid at the double (2) time rate of pay. When a holiday falls on Saturday, it shall be observed on Friday. When a holiday falls on Sunday, it shall be observed on Monday.

NO. 55: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. ~~No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day.~~ When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workmen unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make up day when an observed holiday occurs during the work week. Employees have the option to work that make up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

**ST. CHARLES COUNTY
HOLIDAY SCHEDULE – BUILDING CONSTRUCTION**

NO. 57: All work done on New Year's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day (November 11), Thanksgiving Day, and Christmas Day shall be compensated at the double (2) time rate of pay. When any of these holidays fall on a Sunday, the following Monday shall be observed. No work shall be performed on the days set forth except in cases of emergencies to protect life or property.

NO. 60: All work performed on New Year's Day, Armistice Day (Veteran's Day), Decoration Day (Memorial Day), Independence Day (Fourth of July), Thanksgiving Day and Christmas Day shall be paid at the double time rate of pay. No work shall be performed on Labor Day except when triple (3) time is paid. When a holiday falls on Saturday, Friday will be observed as the holiday. When a holiday falls on Sunday, the following Monday shall be observed as the holiday.

NO. 66: All work performed on Sundays and the following recognized holidays, or the days observed as such, of New Year's Day, Decoration Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day, shall be paid at double (2) the hourly rate plus an amount equal to the hourly Total Indicated Fringe Benefits. Whenever any such holidays fall on a Sunday, the following Monday shall be observed as a holiday.

NO. 69: All work performed on New Year's Day, Memorial Day, July Fourth, Labor Day, Veteran's Day, Thanksgiving Day or Christmas Day shall be compensated at double (2) their straight-time hourly rate of pay. Friday after Thanksgiving and the day before Christmas are also holidays, however, if the employer chooses to work the normal work hours on these days, the employee will be paid at straight -time rate of pay. If a holiday falls on a Saturday, the holiday will be observed on Saturday; if a holiday falls on a Sunday, the holiday will be observed on the following Monday.

NO. 71: All work performed on the following recognized holidays, or days that may be celebrated as such, shall be paid at the double (2) time rate of pay: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Day after Thanksgiving and Christmas Day. If a holiday falls on Sunday, it shall be celebrated on Monday. If a holiday falls on Saturday, it shall be celebrated on the Friday proceeding such Saturday.

NO. 73: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day (or mutually agreed date of the Friday after Thanksgiving Day may be substituted for Veteran's Day), Thanksgiving Day and Christmas Day, or in the event that any of said Holidays falls on Sunday, then the day or days generally recognized as such. Any work performed anywhere on any of the aforesaid Holidays, or on the day or days recognized and observed as such, shall be paid for at double (2) time the regular hourly rate.

OCCUPATIONAL TITLE	* Date of Increase	Basic Hourly Rates	Over-Time Schedule	Holiday Schedule	Total Fringe Benefits
Carpenter	6/16	\$36.21	23	16	\$16.10
Cement Mason	6/16	\$31.16	17	11	\$17.95
Electrician (Outside-Line Construction/Lineman)	9/16	\$43.75	9	12	\$5.25 + 36%
Lineman Operator	9/16	\$37.73	9	12	\$5.25 + 36%
Lineman - Tree Trimmer		\$25.24	32	31	\$10.20 + 3%
Groundman	9/16	\$29.11	9	12	\$5.25 + 36%
Groundman - Tree Trimmer		\$20.00	32	31	\$7.89 + 3%
Laborer					
General Laborer		\$31.18	8	1	\$13.32
Millwright	6/16	\$36.21	23	16	\$16.10
Operating Engineer					
Group I	6/16	\$32.41	10	9	\$25.13
Group II	6/16	\$32.41	10	9	\$25.13
Group III	6/16	\$31.11	10	9	\$25.13
Group IV	6/16	\$27.65	10	9	\$25.13
Oiler-Driver	6/16	\$28.11	10	9	\$25.13
Pile Driver	6/16	\$36.21	23	16	\$16.10
Traffic Control Service Driver		\$28.775	26	25	\$9.045
Truck Driver-Teamster		\$30.41	25	21	\$10.82

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate sheet.

**REPLACEMENT PAGE
ST. CHARLES COUNTY
OVERTIME SCHEDULE - HEAVY CONSTRUCTION**

FED: Minimum requirement per Fair Labor Standards Act means time and one-half (1 ½) shall be paid for all work in excess of forty (40) hours per work week.

NO. 8: Means eight (8) hours shall constitute the regular workday, between the hours of 6:30 a.m. and 5:30 p.m. except when the Employer elects to work four (4) ten (10) hour days as described below. The starting time of the workday can be adjusted from 6:30 a.m. to 9:00 a.m. The Employer may have the option to schedule his work week from Monday through Thursday at Ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate. If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), or other conditions beyond the control of the Employer, the Employer shall have the option to work Friday at the straight time rate of pay to complete his forty (40) hours. However, should a holiday occur, Monday through Thursday, the Employer shall have the option to work Friday at the straight time rate of pay to complete his forty (40) hours. Time and one-half (1½) shall be paid for work performed in excess of eight (8) hours on any regular workday or outside the hours limiting a regular workday. Straight time is not to exceed ten (10) hours a day or forty (40) hours per week. When an Employer works a project on a four (4) ten (10) hour day work schedule, the Employer will not bring in any other crew for a fifth workday on the project while not calling in the normal crew that had been scheduled for that project. Time and one-half (1½) shall be paid for work performed on Saturdays. Double (2) time shall be paid for work performed on Sundays and recognized holidays. Overtime shall be computed at one-half (1/2) intervals. Projects that cannot be performed during regular workday: On Highway/Heavy work, or if required by owner, the contractor may perform work outside the normal work hours and employees shall be paid applicable straight time hourly wage rate plus a premium of one dollar and fifty cents (\$1.50) per hour for the first eight (8) hours worked. Any hours worked in excess of eight (8) hours shall be paid at the applicable overtime rate plus the one dollar and fifty cent (\$1.50) per hour premium. The overtime rate shall be computed after the \$1.50 premium has been added to the hourly wage rate. However, if a contractor employs any other craft on a project being worked outside the normal workday, and is paying the other craft a higher premium, then the Laborers employed by such contractor on such project outside the normal work hours shall be paid the higher premium. Shift work: Shifts may be established when necessary by the Employer. Shifts shall be established for a minimum of three (3) consecutive workdays. The first shift will be paid at eight (8) hours straight time pay for eight (8) hours work. The second shift will be paid at eight (8) hours straight time pay plus a thirty-five cent (\$.35) per hour premium for seven and one-half (7½) hours work. The third shift will be paid at eight (8) hours straight time pay plus a forty-cent (\$.40) per hour premium for seven (7) hours work. Overtime is computed after the premium has been added to the hourly wage rate. Nothing above prohibits the working of two (2) shifts greater than eight (8) hours with excess hours to be paid at overtime rate.

NO. 9: Eight (8) hours shall constitute a work day between the hours of 7:00 a.m. and 4:30 p.m. Forty (40) hours within five (5) days, Monday through Friday inclusive, shall constitute the work week. Work performed in the 9th and 10th hour, Monday through Friday, shall be paid at time and one-half (1½) the regular straight time rate of pay. Contractor has the option to pay two (2) hours per day at the time and one-half (1½) the regular straight time rate of pay between the hours of 6:00 a.m. and 5:30 p.m., Monday through Friday. Worked performed in the first eight (8) hours on Saturday shall be paid at the rate of one and eight tenths (1.8) the regular straight time rate. Work performed outside these hours and on Sundays and recognized legal holidays, or days celebrated as such, shall be paid for at the rate of double (2) time.

**REPLACEMENT PAGE
ST. CHARLES COUNTY
OVERTIME SCHEDULE - HEAVY CONSTRUCTION**

NO. 10: Means the regular workday for which employees shall be compensated at straight time hourly rate of pay shall, unless otherwise provided for, begin at 8:00 a.m. and end at 4:30 p.m. The regular workweek shall consist of five (5) days, Monday through Friday, beginning at 8:00 a.m. and ending at 4:30 p.m. except as may be modified. The starting time may be either advanced or delayed one hour or two hours at the discretion of the Employer. The Employer may have the option to schedule his work week from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate. If the Employer elects to work Monday through Thursday and is stopped due to inclement weather, holidays or other conditions beyond the control of the Employer, he shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hour workweek. All necessary overtime and work performed on Saturday, shall be paid at time and one-half (1½) the hourly rate, plus an amount equal to one-half (½) of the hourly Total Indicated Fringe Benefits. All work performed on Sundays and recognized holidays shall be paid at double (2) the hourly rate, plus an amount equal to the hourly Total Indicated Fringe Benefits. Shifts may be established when considered necessary by the Employer. Shift hours and rates will be as follows. If shifts are established, work on the First Shift will begin between 6:00 a.m. and 9:00 a.m. and consist of eight (8) hours of work plus one-half hour unpaid lunch. Hours worked during the first shift will be paid at the straight time rate of pay. The second shift shall start eight hours after the start of the first shift and consist of eight (8) hours of work plus one-half hour unpaid lunch. Work on the second shift will begin between 2:00 p.m. and 5:00 p.m. and be paid the straight time rate plus \$2.50 per hour. The third shift shall start eight hours after the start of the second shift and consist of eight (8) hours plus one-half hour unpaid lunch. Work on the third shift will begin between 10:00 p.m. and 1:00 a.m. and be paid the straight time rate plus \$3.50 per hour. The additional amounts that are to be paid are only applicable when working shifts. Shifts that begin on Saturday morning through those shifts which end on Sunday morning will be paid at time and one-half these rates. Shifts that begin on Sunday morning through those shifts which end on Monday morning will be paid at double time these rates.

NO. 17: Means eight (8) hours shall constitute the regular work day and forty (40) hours a work week, Monday through Friday. The Employer shall establish the starting time between 6:30 a.m. through 9:00 a.m. An Employer may further adjust the starting time up to 9:30 A.M. throughout the year. Time and one-half (1½) shall be paid after eight (8) consecutive hours worked after the established starting time and for hours worked before the established starting time. Time and one-half (1½) shall be paid for work performed on Saturdays. Work performed on Sundays and Holidays shall be paid at the double (2) time rate of pay. The Employer when working on Highway and Road Work may have the option to schedule the work week for his paving crew only from Monday through Thursday at ten (10) hours per day at the straight time rate of pay with all hours in excess of ten (10) hours in any one day to be at the applicable overtime rate of time and one-half (1½). If the Employer elects to work from Monday through Thursday and is stopped due to inclement weather (rain, snow, sleet falling), the Employer shall have the option to work Friday at the straight time rate of pay to complete the forty (40) hours.

NO. 23: Means the regular workweek shall start on Monday and end on Friday, except where the Employer elects to work Monday through Thursday, (10) hours per day. All work over ten (10) hours in a day or forty (40) hours in a week shall be at the overtime rate of one and one-half (1½) times the regular hourly rate. The regular workday shall be either eight (8) or ten (10) hours. If a job can't work forty (40) hours Monday through Friday because of inclement weather or other conditions beyond the control of the Employer, Friday or Saturday may be worked as a make-up day at straight time (if working 4-10's). Saturday may be worked as a make-up day at straight time (if working 5-8's). An Employer, who is working a four (4) ten (10) hour day work schedule may use Friday as a make-up day when a workday is lost due to a holiday. A workday is to begin at the option of the Employer but not later than 11:00 a.m. except when inclement weather, requirements of the owner or other conditions beyond the reasonable control of the Employer prevent work. Except as worked as a make-up day, time on Saturday shall be worked at one and one-half (1½) times the regular rate. Work performed on Sunday shall be paid at two (2) times the regular rate. Work performed on recognized holidays or days observed as such, shall also be paid at the double (2) time rate of pay. For all overtime hours worked during the week or on Saturday \$15.55 of the fringe benefits portion of the prevailing wage shall be paid at time and one-half (1½). For all overtime hours worked on Sundays or recognized holidays \$15.55 of the fringe benefits portion of the prevailing wage shall be paid double time. The remaining \$.55 of the fringe benefit portion of the prevailing wage shall be paid at straight time.

**REPLACEMENT PAGE
ST. CHARLES COUNTY
OVERTIME SCHEDULE - HEAVY CONSTRUCTION**

NO. 25: Means a regular work week of forty (40) hours, starting on Monday and ending on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof maybe worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A work day is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time maybe advanced or delayed if mutually agreed to by the interest parties. All hours worked on recognized holidays, or days observed as such, double (2) time shall be paid.

NO. 26: Means a regular work week of forty (40) hours will start on Monday and end on Friday. The regular work day shall be either eight (8) or ten (10) hours. If a crew is prevented from working forty (40) hours Monday through Friday, or any part thereof by reason of inclement weather, Saturday or any part thereof may be worked as a make-up day at the straight time rate. Employees who are part of a regular crew on a make-up day, notwithstanding the fact that they may not have been employed the entire week, shall work Saturday at the straight time rate. A workday is to begin between 6:00 a.m. and 9:00 a.m. However, the project starting time may be advanced or delayed if mutually agreed to by the interest parties. For all time worked on recognized holidays, or days observed as such, double (2) time shall be paid.

NO. 32: Means the overtime rate shall be time and one-half the regular rate for work over forty (40) hours per week. Sundays and Holidays shall be paid at double the straight time rate.

**ST. CHARLES COUNTY
HOLIDAY SCHEDULE – HEAVY CONSTRUCTION**

NO. 1: All work done on New Year's Day, Independence Day, Memorial Day, Labor Day, Veteran's Day (November 11), Thanksgiving Day, and Christmas Day shall be compensated at the double (2) time rate of pay. When any of these holidays fall on Sunday, the following Monday shall be observed. No work shall be performed on the days set forth except in cases of emergencies to protect life or property.

NO. 9: All work performed on Sundays and the following recognized holidays, or the days observed as such, of New Year's Day, Decoration Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day and Christmas Day, shall be paid at double (2) the hourly rate plus an amount equal to the hourly Total Indicated Fringe Benefits. Whenever any such holidays fall on a Sunday, the following Monday shall be observed as a holiday.

NO. 11: Means all work performed on New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, Christmas Day, and any additional holidays which may be mutually agreed upon shall be paid at the double (2) time rate of pay. Whenever any such holiday falls on a Sunday, the following Monday shall be recognized and observed as the holiday. No work shall be performed on Labor Day.

NO. 12: All work performed on New Year's Day, Memorial Day, Fourth of July, Labor Day, Veteran's Day, Thanksgiving Day, Christmas Day, or days celebrated as such, shall be paid at the double time rate of pay. When one of the foregoing holidays falls on Sunday, it shall be celebrated on the following Monday. When one of the foregoing holidays falls on Saturday, it shall be celebrated on the Friday before the holiday.

NO. 16: The following days are recognized as holidays: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on Sunday, it shall be observed on the following Monday. If a holiday falls on Saturday, it shall be observed on the preceding Friday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid to the worker unless worked. If workers are required to work the above recognized holidays or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 21: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workman unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make-up day when an observed holiday occurs during the work week. Employees have the option to work that make-up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 25: The following days are recognized as holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. If a holiday falls on a Sunday, it shall be observed on the following Monday. No work shall be performed on Labor Day except in case of jeopardy to work under construction. This rule is applied to protect Labor Day. When a holiday falls during the normal work week, Monday through Friday, it shall be counted as eight (8) hours toward the forty (40) hour week; however, no reimbursement for this eight (8) hours is to be paid the workmen unless worked. An Employer working a four (4) day, ten (10) hour schedule may use Friday as a make up day when an observed holiday occurs during the work week. Employees have the option to work that make up day. If workmen are required to work the above enumerated holidays, or days observed as such, they shall receive double (2) the regular rate of pay for such work.

NO. 31: All work performed on New Year's Day, Presidents' Day, Veterans' Day, Good Friday, Decoration Day, Fourth of July, Labor Day, Christmas Eve Day, Christmas Day, Thanksgiving Day and Day after Thanksgiving or days celebrated for the same.