



City of Wheaton
303 W. Wesley Street
Wheaton, IL 60187-0727
630-260-2000

City of Wheaton, Illinois

www.wheaton.il.us

Description: WATER PUMPING STATIONS GENERATOR REPLACEMENT

Requesting: Invitation to Bid (2 original copies compiled as described within)

Issue Date: April 10, 2017

Mandatory Pre-Bid Meeting: Thursday, April 20, 2017 at 10:00 a.m.

Location: 615 Countryside Drive, Wheaton, IL; meeting will proceed to 1586 S. President Street.

Bid Documents: Copies of the plans may be obtained from BHFX Digital Imaging, www.bhfxplanroom.com, upon a non-refundable payment of \$50.00 per set. Plans can only be purchased through BHFX Digital Imaging.

Last Date for Questions: Wednesday, April 26, 2017 at 12:00 pm local time

Sealed Proposal Submittal Due: Wednesday, May 3, 2017, prior to 11:00 am local time

Public Bid Opening Location: Wednesday, May 3, 2017 at 11:00 a.m.
Wheaton City Hall, 303 West Wesley St., Wheaton, IL
Council Chambers, 2nd Floor

Project Completion: before April 30, 2018

Note: Illinois Prevailing Wage Act 820 ILCS does apply

Contacts for this bid: LStyczen@wheaton.il.us

Enclosures: General Instructions Regarding the Solicitation of Contracted Services
General Terms and Conditions for Contractors
Special Terms and Conditions for Contractors
Project Manual (Plans are available upon request from BHFX Digital Imaging)
Standard Agreement for Contracted Services
Insurance Provisions
Change Order Draft

Bid Submission must include: Cost Proposal Page
Bid Bond (10% of the full contract price) with submittal
Notice of Deviations
Certification of Compliance
Contractor Profile and Submittal Requirements
Certificate of Insurance

If you are awarded the bid,
Additional Documents Required: Signed Standard Agreement for Contracted Services
Payment and Performance Bond (110% of the full contract price)
Certificate of Insurance with endorsements

All questions concerning this solicitation shall be submitted via e-mail to the Procurement Officer and received no later than time stated above. A written response in the form of a public addendum will be published and forwarded to qualified proposers. Contact with anyone other than the Procurement Officer for matters relative to this solicitation during the solicitation process is prohibited.

WATER PUMPING STATIONS GENERATOR REPLACEMENT

GENERAL INSTRUCTIONS REGARDING THE SOLICITATION OF CONTRACTED SERVICES

Solicitations are open to all business firms actively engaged in providing the materials, equipment, and services specified and inferred. Active engagement will be verified via references.

1) SOLICITATION PROCESS

a) Documents:

- i) The City of Wheaton's website, www.wheaton.il.us/bids/ is the official source for all documents related to this solicitation. The City is not responsible for documents distributed by any other source.
- ii) It is the responsibility of the Bidder to seek clarification of any requirement that may not be clear. This includes a review of all solicitation documents.
- iii) All questions concerning this solicitation shall be submitted via e-mail to the attention of the Procurement Officer by the last date for questions as reflected on the cover page of this document. A written response in the form of a public addendum will be published on the City's website, www.wheaton.il.us/bids/.
- iv) Any interpretation, correction or change of the solicitation documents will be made by published Addendum. Interpretations, corrections, and changes to the solicitation documents made in any other manner will not be binding. All addenda will be published on the City's website at <http://www.wheaton.il.us/bids/>. It is up to the Bidder to check this site for the most current addendum.
- v) Bidders shall acknowledge the receipt of any addendum.

b) The Cone of Silence:

- i) The Cone of Silence is designed to protect the integrity of the procurement process by shielding it from undue influences.
- ii) During the period beginning with the issuance of the solicitation document through the execution of the award document, bidders are prohibited from all communications regarding this solicitation with City staff, City consultants, City legal counsel, City agents, or elected officials.
- iii) Any attempt by a bidder to influence a member or members of the aforementioned may be grounds to disqualify the bidder from participation in this solicitation.

c) Exceptions to the Cone of Silence:

- i) Written communications directed to the Procurement Officer
- ii) All communications occurring at pre-bid meetings
- iii) Oral presentations during finalist interviews, negotiation proceedings, or site visits
- iv) Oral presentations before publicly noticed committee meetings
- v) Contractors already on contract with the City to perform services for the City are allowed discussions necessary for the completion of an existing contract.
- vi) Procurement of goods or services for Emergency situations

2) INVESTIGATION

- a) It shall be the responsibility of the Bidder to make any and all investigations necessary to become thoroughly informed of what is required and specified in the solicitation.
 - i) If the site of the work is an area restricted from the general public, a pre-bid meeting will be provided for all potential bidders to perform this inspection.
 - ii) If the site of the work is an area open to the general public, the potential bidder may perform their inspection at a time of their choosing.
- b) Bidder shall inspect in detail the site of the proposed work and familiarize himself with all the local conditions affecting the work and the detailed requirements of delivery, installation, or construction.
- c) No plea of ignorance by the bidder of conditions that exist or that may hereafter exist, because of failure or omission on the part of the bidder to make the necessary examinations and investigations, will be accepted as a basis for varying the requirements of the City or the compensation to the bidder.

3) OFFERS

- a) Exceptions to specifications, requirements, Terms and Conditions must be clearly identified.
 - b) Offers including goods or equipment must include: Manufacturer's warranties and/or guarantees
 - c) Offers including service during the warranty/guarantee period must include, in writing, any restrictions, and/or associated costs.
 - d) QUOTES are to be submitted via fax or e-mail. Verbal offers will not be accepted.
 - e) FORMAL OFFERS must be on the forms provided and compiled in the order stated. Do not use binders, folders, tabs, or papers larger than 8.5 x 11.
 - f) Delivery of an offer is acceptance of the City's requirements. Offers containing terms and conditions contrary to those specified, or taking exception to any of the Special Terms and Conditions, General Terms and Conditions, Specifications, or Addenda as stated by the City may be considered non-responsive.
 - g) The City shall not accept an offer which is based upon any other offer, contract, or reference to any other document or numbers not included in the solicitation documents.
- 4) ORDER OF PRECEDENCE
- a) Wherever requirements are in conflict, the order of precedence shall be as follows: City Agreement, City Specifications, City Special Terms, and Conditions; City General Terms and Conditions.
 - b) City requirements take precedence over Bidder's offer.
- 5) SIGNATURES AS OFFER
- a) Under the conditions of the Uniform Commercial Code, the signing of the submittal by the bidder constitutes an offer. If accepted by the City, the offer becomes part of the Agreement.
 - b) Offers by:
 - i) Individuals or sole proprietorships shall be signed by a person with the authority to enter into legal binding contracts. Said individual shall use his usual signature.
 - ii) Partnerships shall be signed with partnership name by one of the members of the partnership, or an authorized representative, followed by the signature and title of the person signing.
 - iii) By corporations shall be signed with the name of the corporation, followed by the signature and title of person authorized to bind it in the matter.
- 6) WITHDRAWAL OF OFFERS
- a) Offers may be withdrawn at any time prior to the scheduled opening or due date. Requests to withdraw an offer shall be in writing, properly signed, and received by the Procurement Officer prior to the due date.
 - b) Offers may not be withdrawn after the due date without the approval of the Procurement Officer.
 - c) Negligence in preparing an offer confers no right of withdrawal after opening / due date.
- 7) TIMEFRAME AND CONSEQUENCES
- a) Offers must be received before the designated time.
 - b) Offers received after the designated time will be returned to the sender without review. Offers received late that may be attributed to delays by overnight delivery services, or by delivery services trying to deliver when offices are closed, will be considered late and returned to the sender.
 - c) Unless otherwise specified in the solicitation, offers shall be binding for ninety (90) calendar days following due date.
- 8) PUBLIC OPENINGS
- a) Formal offers by sealed envelope will be publicly opened at the time and location stated. The Procurement Officer shall read the name of the bidder, offered price, and note if deviations are stated. after the opening an apparent low bid will be announced. Award will be based on analysis of costs, deviations, city budget, and approval by City Council.
 - b) Results of Openings will be published on the City's website www.wheaton.il.us/bids/ within three business days.
 - c) Bidders are encouraged to attend all openings and to offer constructive suggestions for improvements to the solicitation process, to increase competition, and ways in which the City may achieve greater savings and increased transparency.

- d) Despite the reading of offers at a public opening, if the offers are thence rejected and thus subject to rebid, the read results will not be published and will be exempt from FOIA requests.

9) REQUIREMENTS

a) Brand Names or Equal:

- i) Specifications are prepared to describe the goods and services which the City deems to be in its best interests to meet its performance requirements. These specifications shall be considered the minimum standards expected of the contractor.
- ii) If an offer does not indicate deviations or alternatives to the specifications, the City shall assume the offer is fully compliant with all specifications.
- iii) Specifications are not intended to exclude potential contractors. Any reference in the City's specifications to a brand name, manufacturer, trade name, catalog number or the like is descriptive, not restrictive, indicating materials that are satisfactory.
- iv) Consideration of other makes and models will be considered, provided the bidder submits a request for pre-approval by the Last Date for Questions stated on the cover page. Bidder should state exactly what he proposes and attach a cut sheet, illustration or other descriptive matter which will clearly indicate the character of the item. A written response in the form of a public addendum will be published on the City's website, www.wheaton.il.us/bids/.

b) Quantities:

- i) All quantities represent an estimate of the quantity of the work to be done and/or materials to be ordered. It is given as a basis for comparison of offers and to determine the awarding of the Agreement.
- ii) The City does not expressly or by implication agree that the actual quantities involved will correspond to the published estimate. The bidder accepts that the quantities stated are estimates only and will not hold the City bound to said number.
- iii) The City reserves the right to modify the estimates, or remove them in their entirety, whichever is in the best interests of the City.

10) BID BONDS

- a) The City may require a Bid Bond / Bid Deposit if so stated.
- b) Bid Bonds / Bid Deposits are typically ten percent (10%) of the full contract price unless depicted otherwise.
- c) If a Bid Deposit (preferred), it shall be submitted with the formal offer and be in the form of a certified check or a bank cashier's check made payable to the City of Wheaton. Checks will be retained by the City until an award is fully executed, at which time the checks will be promptly returned to the unsuccessful Bidders.
 - i) The Bid Deposit check of the successful Bidder will be retained until the Agreement has been executed and all required documents, including a Performance Bond if requested, are received.
 - ii) The Bid Deposit check of the successful Bidder shall be forfeited to the City if the Bidder withdraws its offer, or neglects, refuses or is unable to enter into an agreement.
- d) If Bidder chooses to use a Bid Bond, the Bid Bond must be in compliance with all bond requirements mandated by the State of Illinois.

11) DEVIATIONS TO REQUIREMENTS AND ALTERNATE OFFERS

- a) If the Bidder is unable to meet most of the specifications, but believes their product/work will meet the needs of the city, the Bidder should submit an Alternate Bid and include material specification sheets, performance data, or other documentation justifying consideration.
- b) If a Bidder plans to submit multiple offers, each offer must be packaged separately and identified on the outer envelope and on the cover page of the offer in a way that can be differentiated from the other offer(s).
- c) The Procurement Officer reserves the right to make the final determination of compliance or whether any deviation or alternate is of an equivalent or better quality and which offer can best meet the needs of the City. Such determination shall be incorporated within Purchasing's recommendation to the City Council.

12) ENVIRONMENTAL REQUIREMENTS

- a) The City is committed to becoming a sustainable city that conserves its use of resources to optimize efficiency and minimize waste. The City is committed to providing services in an equitable manner for present and future generations.
- b) Recycled Content Products: It is in the City's interest to purchase products with the highest recycled material content feasible. The City requests that Bidders suggest recycled content products as alternatives.
- c) Recycled Packing Material: The City desires that all shipping containers/packing material for equipment, materials and supplies delivered to the City contain no less than the specified minimum EPA percentage requirements of post-consumer recycled content. Containers and packing material should show the recycled product logo and recycled content percentage information.
- d) To help "Turn Wheaton Green", the bidder's sustainability policy, as well as green initiatives for this solicitation, will be considered in the evaluation of the offer.

13) PRICE

- a) The price offered shall remain firm throughout the duration of the Agreement.
- b) Failure to record all requested breakdown of prices may result in disqualification. Unit price shall be shown for each unit specified. In case of mistake in extended price, unit price shall govern.
- c) Price shall represent the entire cost of all requirements stated within the solicitation and Agreement. No subsequent claim will be recognized for any surcharges, add on costs, increase in material prices, cost indexes, wage scales, fuel surcharges, freight costs, packaging or any other rates affecting the industry or this project.

14) FOR PROJECTS BID AS TIME AND MATERIAL

- a) Time, inclusive of but not limited to salaries, benefits, overtime, set-up, break-down, includes all costs associated with labor for this service.
- b) Material, inclusive of but not limited to goods, components, equipment, includes all costs associated with all items necessary to complete this service.
 - i) Complete illustrative and technical data, drawings, and/or printed literature for the materials or equipment quoted should be included with the offer.
- c) Overhead and Profit shall include all costs not covered under material or labor, such as fixed costs and taxes.

15) DISCOUNTS

- a) Discounts of less than thirty (30) days will not be considered in the evaluation.
- b) Discounts for thirty (30) days or more may be considered in the evaluation.
- c) Where the net offer is equal to an offer with a discount deducted, the award shall be made to the net offer.
- d) Discounts will be figured from the date of receipt of a proper invoice or the approval of the quality of the product received or service completed – whichever is later.

16) TAXES

- a) Unit prices shall not include any local, state or federal taxes.
- b) The City is exempt by law from paying sales tax on goods, equipment, and products permanently incorporated to the project, from State and City Retailer's Occupation Tax, State Service Occupation Tax, State Use Tax, and Federal Excise Tax.
- c) The City's Sales Tax Exemption Number is E9997-4312-07.
- d) The Contractor shall pay sales, consumer, use and other similar taxes.

17) EVALUATION OF OFFERS

- a) Receipt of One (or too few) offers: If the City receives one or too few bids, as defined by the City, from a publicly broadcasted solicitation, the City may reschedule the opening to a later date. The offers received will either be:
 - i) returned unopened to the Bidder for re-submittal at the new due date and time, or
 - ii) if there are no changes in requirements, and pending agreement with the Bidder, held until the new due date and time
- b) If the City does not receive any bids, from a publicly broadcasted solicitation, the City may negotiate with any interested parties.

18) DETERMINING RESPONSIVENESS OF THE OFFER

- a) Responsive bids are inclusive of, but not restricted to: received prior to the due date and time, completed as stated in the solicitation documents, inclusive of all required documents, compliant to all product requirements and specifications, able to meet delivery requirements, accepting of all Agreement terms and conditions.

19) WAIVERS AND REJECTIONS OF OFFERS

- a) The City reserves the right to waive any informality, technical requirement, deficiency, or irregularity in the offer. The City may conduct discussion with Bidders to further clarify the offer as may be necessary. Correction of the offer shall be effected by submission within 4 hours (e-mail or fax) of a corrected page with changes documented and signed.
- b) The City reserves the right to reject any or all offers for any reason including but not limited to: budgetary constraints, unclear solicitation documents, change in needs, suspicion of collusion, pricing aberrations, front end loading; mathematically unbalanced proposals in which prices for some items are substantially out of proportion to comparable prices, materially unbalanced proposals in which material requirements for some items are substantially higher to comparable proposals; poor quality or poor performance in past City contracts, and other reasons deemed important to the City.
- c) The City reserves the right to accept or reject any offer in which the Bidder names a total price for all the work without breaking down requested material costs, labor costs, and/or overhead and profit.
- d) Multiple offers from an individual, firm, partnership, corporation, or association under the same or different names are subject to rejection unless specifically permitted in the solicitation. Reasonable grounds for believing that a bidder is interested in more than one offer may result in rejection of all offers in which the bidder is interested. Any or all offers will be rejected if there is any reason for believing that collusion exists.
- e) Nothing in this section will preclude a firm acting as a subcontractor to be included as a subcontractor for two or more prime contractors submitting a proposal for work. However, a subcontractor may not submit a proposal as a prime contractor, and a prime contractor may not submit a proposal as a subcontractor.
- f) FOIA: If the City rejects all offers and concurrently provides notice of its intent to reissue the solicitation, the rejected offers remain exempt from FOIA requirements until the City awards or rejects the reissued solicitation.

20) DETERMINING RESPONSIBLNESS OF THE BIDDER

- a) The City reserves the right to determine the competence, the financial stability, and the operational capacity, of any Bidder.
- b) Upon request by the City, Bidders shall furnish evidence for the City to evaluate their resources and ability to provide the goods and services required. Such evidence may include; but not be limited to: tour of facilities, staffing levels, listing of equipment and vehicles, listing of personnel's qualifications, certificates, licenses; listing of committed but not yet completed orders; financial statements.
- c) Bidder may be required to submit samples of items within a specified timeframe and at no expense to the City. If not destroyed in testing, samples will be returned at the Supplier's request and expense. Samples which are not requested for return within thirty (30) days will become the property of the City.
- d) Bidders may be required to affect a demonstration of the item or service being proposed. Such demonstration must be at a site convenient and agreeable to the affected City personnel and at no cost to the City.
- e) Bidders may be required to provide references. The City reserves the right to contact said references or other references that may be familiar with the Bidder. The City reserves the right to eliminate a bidder who has not demonstrated the required years of service within the required specialty.
- f) Bidders may be required to provide their internal policy on sustainability.
- g) The City reserves the right to determine if such information might hinder, influence the quality of the work specified, or prevent the prompt completion of additional work such as future maintenance and service.

21) CONFIDENTIAL INFORMATION

- a) Bidders may be required to provide evidence of financial viability. This may be a Dunn and Bradstreet Report, a financial statement prepared by a licensed Certified Public Accountant showing the Bidder's financial condition at the end of the past fiscal year, an annual report.

- b) Bidders may be required to provide other information which they consider proprietary and confidential, and if made known to the public, may affect their ability to compete in the marketplace. Said information will be subject to Illinois State FOIA requirements including the following exemptions:
 - i) (5 ILCS 140/7) (From Ch. 116, par. 207) Sec. 7.
 - ii) Exemptions. (1) The following shall be exempt from inspection and copying: (g) Trade secrets and commercial or financial information obtained from a person or business where the trade secrets or commercial or financial information are furnished under a claim that they are proprietary, privileged or confidential, and that disclosure of the trade secrets or commercial or financial information would cause competitive harm to the person or business and only insofar as the claim directly applies to the records requested.
- c) Bidders considering requests to be proprietary and confidential should submit an additional redacted offer. Failure to do so may result in information becoming available to the public.

22) SELECTION PROCESS

- a) The City endeavors to select the offer meeting the best interests of the City as stated by its City Council based on the totality of lawful considerations.
- b) The City's determination of best overall value may include consideration of the City's internal cost structure for meeting requirements, such as the city's inventory carrying costs, ordering lead times, equipment maintenance costs, standardization, available project management resources, and items typically identified with and relating to a "Life Cycle Cost Analysis".
- c) The City will consider the following non-exclusive list in determining award: soft costs of Agreement management; total cost of ownership factors such as transition costs, training costs, additional requirements such as spare parts and special tooling.
- d) The City will contact references to verify bidder's ability and skill to perform the work required based on: past work of similar nature, quality of work, proactive nature of work crew, adherence to the project's production schedule and proposed price constraints, and references' experience if the contractor has character, integrity, and a reputation for good judgment.
- e) If the city's evaluation yields a concern with the potentially recommended bidder's ability, the City reserves the right to require a Performance Bond at no additional cost to the city.
- f) If two (2) or more bids are received which are in all respects equal, the Agreement shall be awarded to a bidder maintaining a place of business in the City; however, if all or none of such bidders maintain a place of business in the City, then the Agreement shall be awarded by drawing lots. If the Agreement award must be determined by drawing lots, the affected bidders shall be notified no less than forty-eight (48) hours prior to the drawing of lots to allow for the bidders or their designees to be present, if they so choose, to witness the drawing of lots. The drawing of lots shall be managed by the City Procurement Officer and the result shall be final subject to all other Agreement terms and conditions.

23) AWARD

- a) Except as otherwise stated, bidders will be awarded within ninety (90) days from the opening date.
- b) Award is based on the lowest responsive responsible offer; offering the lowest life-cycle cost; providing the best overall value to the City; and deemed most advantageous to the City, price and other factors considered.
- c) When there is a Base Bid and Alternates, the low bidder shall be the lowest responsible and responsive bid submitted for the Base Bid and Alternate A. If all Bids and Alternate A exceed the project budget, the city reserves the right to award to the bidder presenting the best alternatives for the city.
- d) When there is a Base Bid and Options, the low bidder shall be the lowest responsible and responsive bid submitted for the best combinations for the city.
- e) The City reserves the right to award by item, part or portion of an item, group of items, in the aggregate, or to reject any and all offers in whole or in part according to the best interests of the City.
 - i) Bidder may restrict their offer to consideration in the aggregate by so stating on the proposal form, but must name a unit price on each item.
- f) The successful Bidder may be required to enter into an Agreement with the City of Wheaton covering all matters set forth in the solicitation document, and addenda.

24) REQUIREMENTS IF AWARDED THE WORK

- a) Registration: The successful supplier, prior to the execution of the order, or no later than 10 days after receipt of the award document, must be registered to do business in the City of Wheaton and the State of Illinois.
- b) Insurance: The successful Bidder, if awarded by Agreement, will be required to carry insurance acceptable to the City. (*reference Contract Addendum 1*).
 - i) Certificates of Insurance, Endorsements, and a Waiver of Subjugation must be submitted with the execution of the Agreement.
 - ii) The Bidders obligation to purchase stated insurance cannot be waived by the city's action or inaction.
- c) Bonds: The successful bidder, if awarded by Agreement, may be required to provide a bond/bonds. Said bonds must be through a bonding company listed on the Department of the Treasury's Listing of Certified Companies http://www.fms.treas.gov/c570/c570_a-z.html.
 - i) Surety must be in compliance with any bond requirements mandated by the State of Illinois.
- d) Security Clearance: Background checks inclusive of finger printing MAY be required for contractors servicing secured areas. Contractors will submit a list of employees' names to the Project Manager who will coordinate the background checks with the police department. Said list should include staff to cover absences or reassignment.
 - i) Anyone with a background history showing a conviction for a felony; theft history of any kind, sex offense history, or any crime involving moral turpitude, illegal drug or narcotics use, sale or possession, or anyone showing a felony charge pending, or who has any outstanding warrants of any type, including misdemeanor traffic or felony warrants, may be subject to arrest, and will not be allowed to work under this Agreement.
 - ii) The contractor shall be responsible for all personnel engaged in the work. Contractor must ensure that: said personnel have been completely and satisfactorily cleared by the City of Wheaton for work within secure areas; a sufficient amount of backup or relief personnel to cover absenteeism or replacement have been completely and satisfactorily cleared or work; equipment and personnel do not enter facilities except as required during the progress of the work.
 - iii) The City reserves the right to request removal of any contractor's employee upon submitting proper justification should such action be considered necessary to the best interests of the City. Contractor is permitted to add/replace personnel with approved backup personnel, or reassign personnel already cleared by the City for work within secure areas. The City must be provided written notice prior to time of replacement.

25) AUDIT

- a) The successful Bidder may be audited by the City or an agent of the City. Audits may be at the request of federal or state regulatory agencies, other governmental agencies, courts of law, consultants hired by the City or other parties which in the City's opinion requires information. Data, information, and documentation will include, but not be limited to, original estimate files, change order estimate files, detailed worksheets, subcontractor proposals, supplier quotes and rebates, and all project related correspondence, and subcontractor and supplier change order files.

26) PROTESTS

- a) Any Bidder who claims to be aggrieved in connection with a solicitation, the selection process, a pending award, or other reasonable issue may initiate a protest.
 - i) Protests involving the solicitation process or stated requirements must be presented in writing via e-mail to the Procurement Officer no later than the last date for questions as reflected on the cover page of this document.
 - ii) Protests involving the evaluation of offers, staff recommendations, or the award process must be submitted in writing to the Procurement Officer no later than three business days after bid results are publicly posted.
- b) Protests must include: the name and address of the protestor; appropriate identification of the solicitation; if an award has been initiated, the award document number (if available), identification of the procedure that is alleged to have been violated; precise statement(s) of the relevant facts; identification of the issue to be resolved; protestor's argument and supporting documentation (Exhibits, evidence, or documents to substantiate any claims).

- c) A person filing a notice of protest will be required, at the time the notice of protest is filed, to post a bond in the form of a cashier's check in an amount equal to twenty-five percent of the City's estimate of the total volume of the award, or \$1,000, whichever is less.
 - i) If the decision of the Protest does not uphold the action taken by the City, then the City shall return the amount, without deduction, to the Bidder filing the protest.
 - ii) If the decision of the Protest upholds the action taken by the City, then the City shall retain the amount of the cashier's check in payment for a portion of the cost and expense for time spent by City staff in responding to the protest and in conducting the evaluation of the protest.
- d) Upon receipt of the notice of protest, the Procurement Officer shall stop the award process.
 - i) The Procurement Officer will rule on the protest in writing within two business days from receipt of protest.
 - ii) Appeals of the Procurement Officer's decision must be made in writing within two business days after receipt thereof and submitted to the City Manager for final resolution. Appellant shall have the opportunity to be heard and an opportunity to present evidence in support of the appeal.
 - iii) The City Manager's decision is final.

27) **OTHER ENTITY USE**

- a) Although this solicitation is specific to the City of Wheaton, Offerors have the option of allowing this offer, if awarded by the City to the Offeror, to be available to other local entities and agencies within the DuPage-Kane-Cook-Will and Kendall Counties. If the successful Offeror and the interested entity/agency mutually agree on the Terms and Conditions, inclusive of pricing, both parties may perform business under the authority of this solicitation and Agreement.
- b) It is understood that at no time will any city or municipality or other agency be obligated for placing an order for any other city, municipality, or agency; nor will any city or municipality or agency be obligated for any bills incurred by any other city or municipality or agency. Further, it is understood that each agency will issue its own purchase order to the awarded Supplier.

END OF GENERAL INSTRUCTIONS REGARDING THE SOLICITATION OF CONTRACTED SERVICES

WATER PUMPING STATIONS GENERATOR REPLACEMENT

GENERAL TERMS AND CONDITIONS FOR CONTRACTORS

- 1) **AGREEMENT ADMINISTRATION**
 - a) A “Work May Proceed” order will be issued by Procurement upon confirmation of a properly executed Agreement.
 - b) Once the “Work May Proceed” order is issued, the contractor's primary contact with the city will become the Project Manager.
 - c) The Project Manager’s primary responsibility is to assure the city receives the contracted services in accordance to the terms and conditions and specifications of the Agreement. The Project Manager will, but is not limited to: oversee the entire project from kick-off activities through close out and payment of final invoice; monitor equipment, materials, and project progress; address any quality issues and change orders; verify schedule of Values, output, schedule status; conduct random inspections.
 - d) The contractor will provide name and contact information of key contact to the Project Manager for use during time of emergency or at any hour city staff sees fit to do so.
 - a. If security clearance is required for this work, it will be pursued at this time.
- 2) **COMMUNICATIONS PLAN**
 - a) The contractor shall designate an individual who must be present, at all times, on the site and who will serve as the contractor’s authorized representative throughout the completion of the Work and who shall be readily available to respond to communications. This individual must be a competent, English-speaking individual who is capable of reading and understanding the Agreement Documents. This representative shall be subject to receive instructions and have full authority to execute the directions, without delay, and promptly supply any necessary labor, equipment, material, or incidentals to do so. If any person employed shall refuse or neglect to obey the directions of the Project Manager, in anything relating to the Work, or shall appear to be incompetent, disorderly, or unfaithful, he/she shall, upon request of the City, be at once discharged and shall not be employed again on any part of the Work.
 - b) The contractor shall provide the name and phone number of the contractor’s representative who, in the case of an off-hours emergency can be readily accessible and be available for quick response to the site. If that person does not respond within the period of time requested all reasonable costs, including the payment of overtime wages or charges, shall be deducted from payments due the contractor. Contractor shall immediately notify the Project Manager in writing of any change in the identity and telephone number of the contractor’s representative.
 - c) The contractor is required to provide the City’s project manager with written/e-mailed bulletins addressing the status of the project throughout the life of the Agreement.
 - d) The bulletins shall cover all work performed and completed and shall confirm the schedule of the work yet to be performed. It shall also state any assumptions and/or exclusions.
 - e) The bulletin shall identify problems encountered, or still outstanding, with an explanation of the cause and resolution of the problem or how the problem will be resolved.
 - f) The contractor will be responsible for conducting status meetings with the project manager as scheduled. The meetings can be in person or over the phone, at the discretion of the city.
- 3) **DOCUMENTS**
 - a) Contractor is to maintain at the job site a complete and current set of drawings, plans and contract documents; bulletins, supplemental instructions, proposals, change orders, subcontractor's proposals, supplier’s invoices, all written requests, and responses to each required change.
 - b) All documents must accurately reflect the current status of all pertinent data including changes in the line item quantities and Agreement sum attributed to change orders.
 - c) All documents are to be available to the Project Manager.
 - d) All documents are to be available for auditing purposes, FOIA, and other reasons necessitated by the city.

- 4) MATERIAL AND EQUIPMENT
- a) If the offer identifies an item by manufacturer's name, trade name, catalog number, or reference, the contractor shall furnish the item so identified and shall not propose to furnish an "equal".
 - b) If the identified item is no longer available, the City must approve any proposed "equal" prior to order placement. The City will not incur any additional costs for the "equal".
 - c) All components used in the manufacture or construction of materials, supplies and equipment, and all finished materials, shall be new, the latest make/model, of the best quality, and the highest grade workmanship.
 - d) Contractor must provide documentation that any and all Hazardous Material created during the performance of the project work has been disposed of or recycled in compliance with all Illinois Administrative Code Title 35, Part 733 "Standards for Universal Waste Management", and other applicable State, Federal and local regulations.
 - e) All material or equipment furnished shall meet the minimum requirements of Occupational Safety & Health Standard (OSHA) published in the Federal Register, U L, or other nationally recognized certifying body.
- 5) SUBSTITUTIONS
- a) No substitutions will be considered after Notice of Award except under one or more of the following conditions:
 - i) Substitution required for compliance with final interpretations of code requirement or insurance regulations
 - ii) Unavailability of specified products, through no fault of the contractor.
 - iii) Subsequent information discloses inability of specified product to perform properly or to fit in designated space.
 - iv) Manufacturer /fabricator refusal to certify or guarantee performance of specified product as specified.
 - v) When a substitution would be substantially to owner's best interest.
 - b) Substitutions will not be considered when items are indicated or implied on shop drawings or product data submittals without formal request.
- 6) REQUESTS FOR SUBSTITUTION
- a) Submit request for substitution to the attention of the Project Manager. Include documentation confirming compliance of proposed substitution with Agreement documents.
 - i) For products include: Product description and identification, manufacturer's name, and address. manufacturer's literature, performance and test data, reference standards, samples, name, and address of similar projects on which product was used and dates of installation
 - ii) For construction methods include: detailed description of proposed method, drawings illustrating methods, itemized comparison of proposed substitution with product or method specified, statement regarding the effect of the substitution to the construction schedule
 - b) Identify: changes or coordination required, other contracts affected, accurate cost data on proposed substitution in comparison with product or method specified.
 - c) Contractor attests that he has personally investigated proposed product or method and determined that it is equal or superior in all respects to that specified; that he will provide the same guarantee for substitution as for product or method specified; that he will coordinate installation of accepted substitutions into the work, making all changes for work to be complete in all respects.
 - d) Cost data must include all related costs under Agreement but excludes owner's redesign, administrative costs of owner, costs under separate agreements.
 - e) Contractor will pay all additional costs and expenses for owner and other contractors.
 - i) Acceptance of substitution will require substantial revision of plans, drawings, and Agreement documents for all related projects.
- 7) DELIVERY AND STORAGE
- a) Deliveries of documents, materials, equipment etc. are between the hours of 8:30 A.M. and 3:00 P.M. Monday through Friday, excluding holidays, unless otherwise stipulated.
 - b) Failure to deliver within a reasonable lead-time as determined by the city, shall constitute authority for the Procurement Officer to purchase in the open market items of comparable grade to replace the items not delivered.

- c) Contractor is to accept material and equipment delivered to the job site and is responsible to store all items in accordance with the manufacturer's written instructions, handling, and protection from weather, damage, and theft for the duration of the Agreement. Contractor shall be responsible for losses.
 - d) Material delivered shall remain the property of the Contractor until:
 - i) A physical inspection and actual usage of the material is made and found to be acceptable to the City; and
 - ii) Material is determined to be in full compliance with the solicitation documents and executed Agreement.
 - iii) Where circumstances or conditions exist preventing effective inspection of the goods at the time of delivery, the City of Wheaton reserves the right to inspect the goods within a reasonable time after delivery.
 - e) Contractor assumes full responsibility for protection and safekeeping of the contractor's own materials and equipment stored on premises, and move, if necessary, all stored products which interfere with operations of the city.
 - f) Unless otherwise specified, packaged material shall remain in original containers with labels intact and seals unbroken.
 - g) The contractor shall submit a Material Safety Data Sheet (MSDS) prior to or at the time of delivery for any/all toxic substances per Public Act 83-240, OSHA standards or any other applicable law.
- 8) NONCONFORMING MATERIALS
- a) In the event the delivered material is not in compliance to the specification documents and executed Agreement, the City will reject the material.
 - b) Contractor shall remove rejected materials at his expense promptly after notification of rejection.
 - c) Contractor shall provide replacement of rejected articles immediately. If replacement is not timely, as determined by the city, the Procurement Officer will purchase in the open market items of comparable grade to replace the items not replaced and the Contractor shall reimburse the City for any expense incurred in excess of Agreement prices. Such purchases shall be deducted from Agreement quantities
 - d) The city reserves the right to either: cancel the order; request contractor to issue credit to the city; or deduct such amount from monies owed.
 - e) Should public necessity demand it, the City reserves the right to use or consume items delivered which are substandard in quality, subject to an adjustment in price to be determined by the Procurement Officer.
- 9) WARRANTY / GUARANTEE PERIOD
- a) The Contractor warrants that all goods furnished hereunder will conform in all respects to the terms of this order, including any drawings, specifications, or standards incorporated herein, and/or defects in goods are free from defects in design. Contractor also warrants the goods are suitable for and will perform in accordance with the purposes for which they were intended.
 - b) The Contractor agrees that the supplies or services furnished under this Agreement shall be covered by the most favorable commercial warranties the Contractor gives to any customer for such supplies or services and that the rights and remedies provided herein are in addition to and do not limit any rights afforded to the City by any other clause of this Agreement or by law.
 - c) Unless otherwise specified, the contractor shall unconditionally guarantee the materials and workmanship on all equipment furnished by him for a period of one year (Guarantee Period) from date of installation close out.
 - d) If within the Guarantee Period any defects or signs of deterioration are noted which, in the opinion of the City, are due to faulty design and installation, workmanship, or materials, the City shall notify the contractor. At the contractor's expense, the Contractor shall repair or adjust the equipment or parts to correct the condition, or replace the part or equipment to the complete satisfaction of the city.
 - i) Replacement parts of defective components shall be supplied at no cost to the City. Shipping costs for defective parts required to be returned to the contractor shall be paid by the contractor.
- 10) MANUFACTURER'S REQUIREMENTS
- a) All work must be performed according to manufacturer's stated recommendations.
 - b) If manufacturer's stated recommendations conflict with specifications, issues should be addressed in writing to the Project Manager prior to proceeding with any work.

- c) If manufacturer's stated recommendations include required services not listed within the specifications, said services must be considered as inherent to the city's specifications and offers should include said services.
- d) All work is to be performed consistent to industrial performance standards.

11) PERMITS AND LICENSES

- a) The successful contractor shall be responsible for obtaining, at their own expense, all permits and licenses which may be required to complete the Agreement.
- b) Contractor represents that it, its employees, agents, and subcontractors shall hold all required licenses, permits, qualifications and certificates, and have duly registered and otherwise complied in all respects with all applicable federal, state and local laws, regulations, and ordinances applicable to the performance of this Agreement.

12) CONTRACTOR USE OF PREMISES

- a) Confine operations at site to areas permitted by all laws, ordinances, and permits, as well as the Agreement documents.
- b) The contractor shall control operations to avoid interference with normal traffic flow on and around the site; when necessary provide barriers, warning lights, and signs as required to protect workers and the public.
- c) Limit use of premises for work, storage of material and equipment, and parking of worker's automobiles.
- d) Conduct operations in a manner that avoids interference with use of the building and building operations and which protects persons and property.
- e) If utility shut-down is required, provide Project Manager two (2) days advanced warning and estimation of duration of required utility shutdown.

13) UTILITY LOCATION

- a) The contractor must exercise extreme caution while working around existing utilities. The contractor shall notify J.U.L.I.E., utility companies, and the Project Manager before commencing construction work around utility locations within the scope of the project.

14) CONTRACTOR IDENTIFICATION

- a) For security purposes, all contracted service providers must be clearly identified with company photo id and company attire.
- b) Upon Project Manager's approval, contractors requiring unrestricted mobility within designated facilities will require a City of Wheaton contractor photo id.
- c) Contractor's advertising decals, stickers or other signs shall not be affixed to equipment or visible to the public.

15) MANUALS AND DOCUMENTS

- a) The contractor shall submit to the owner such operating and maintenance manual and repair part lists as required by the nature of the work.

16) CLEANING

- a) Contractor shall maintain premises and public properties free from accumulation of waste, debris, and rubbish caused by construction operations. Cleaning and disposal operations must comply with Federal, State and local ordinances and anti-pollution laws.
- b) Provide on-site metal containers for collection of waste materials, debris, and rubbish.
- c) At completion of work: sweep paved areas broom clean; remove waste materials, rubbish, tools, equipment, machinery, and surplus materials; clean all sight-exposed surfaces and leave project area clean and ready for use; clean the project site, yard, grounds, and landscaped areas; remove petro- chemical spills, stains, and other foreign deposits; clean plumbing fixtures to a sanitary condition, free of stains.
- d) Touch-up and otherwise repair and restore marred exposed finishes and surfaces.

17) SAFETY AND HEALTH

- a) All Occupational Safety and Health Administration (OSHA) standards apply.
- b) Store volatile wastes in covered metal containers and remove from premises daily.

- c) Provide adequate ventilation during use of volatile or noxious substances.

18) CHANGE ORDER PROCEDURE

- a) The city reserves the right to make changes in the plans and specifications by altering, adding to, or deducting from the work, without invalidating the Agreement. All such changes shall be executed under the conditions of the original Agreement, except that any claim for extension of time caused thereby shall be adjusted at the time of ordering such change.
- b) Bulletins: From time to time during progress of the work, the city may issue a bulletin which interprets the Agreement documents or order minor changes in the work without change in Agreement sum or Agreement time.
 - i) Issuance of a bulletin is not to be considered a change order authorizing additional work or affecting project time table. Such changes require a proposal, review, and if approved, a change order.
- c) Should the contractor consider that a change in the specified work, the Agreement sum or Agreement time is required, he shall initiate a change order and submit to the Project Manager for documented approval before proceeding with the work.

19) CHANGE ORDERS

- a) Issuance of a statement, or verbal approval, is not to be considered a Change Order and is not authorization to proceed.
- b) Change orders will be numbered in sequence and dated.
- c) Approved Change Orders are required with any/all changes in, the specified work, the Agreement sum, the time for completion, or any combination thereof.
- d) Change orders will describe the change or changes, will refer to the bulletin(s) and proposal(s) involved, and will be signed by the city and the contractor prior to implementing the change.
- e) All Change Orders shall clearly identify the impact of cost and the effect on time required to perform the work associated with the proposal.
 - i) If the proposal is found to be satisfactory and in proper order, and both parties agree upon cost or credit for the change, the city will authorize the documented Change Order which will be confirmed via Agreement amendment.
 - ii) Additional requests for additional costs and/or extensions of time for previously proposed and accepted items will NOT be granted after initial acceptance.
- f) The contractor will take measures to ensure contractors and sub-contractor's staff is familiar with the procedures for processing change orders.

20) PAYMENT

- a) Authorization of payment requires receipt of contractor's invoice, acceptance of product/services and receipt of other required paperwork such as: certificate of origin, MSDS, Waivers and Liens, Certified Payroll (if applicable).
- b) Retainage in the amount of ten percent (10%) of a payment request will be deducted from the amount determined for the first fifty percent (50%) of the project for major projects. Retainage will be held until:
 - i) All defective work has been remedied.
 - ii) All work is 100% final and the City's project manager has formally accepted the work.
 - iii) All waivers, liens, certified payrolls, warranty documents and other required documentation are provided.
 - iv) Or, if the work is fifty percent (50%) completed, satisfactory and on schedule, upon the discretion of the Project Manager. In such a case, the city will continue to retain no less than five percent (5%) of the total adjusted Agreement price.
 - v) Retainage will not apply to payments for Bonds and Mobilization.
- c) Payment will be:
 - i) made to the company awarded this order. Under no circumstances will a third party be reimbursed.
 - ii) Via the City's Purchasing Card Program, MasterCard, in which payment will occur at time of product or service delivery (preferred); or
 - iii) Via supplier generated invoice.

- d) The City complies with the Illinois Local Government Prompt Payment Act which states that any bill approved for payment shall be paid within 30 days after date of approval.
 - i) Invoices must be submitted to the city within six months of order completion. Any invoices submitted in excess of six months from order completion will not be paid.
- 21) **CONTRACTOR SERVICE ISSUES**
 - a) Recourse for non-compliant construction services shall be managed, in any order, via (a) Punch List, (b) Retainage and/or (c) Performance Bonds.
- 22) **LIQUIDATED DAMAGES**
 - a) Delivery delays beyond the Agreement delivery date will result in added expense to the city. The city shall be paid damages for such delay. Because the amount of damage is extremely difficult to ascertain, the contractor agrees to compensate the city in the amount specified in the document entitled Special Terms and Conditions for Contracted Services in the section entitled Liquidated Damages.
 - b) This amount shall be fixed as liquidated damages that the City will suffer because of such delay, and not as a penalty.
 - c) The City shall have the right to deduct and retain the amount of such liquidated damages from any monies due the contractor.
 - d) The contractor shall be entitled to a reasonable extension of time for unavoidable delay in delivery due to causes not reasonably foreseeable by the parties at the time of the Agreement execution, and that are entirely beyond the control and without the fault or negligence of the contractor, including, but not limited to, acts of god or the public enemy , war or other national emergency making delivery temporarily impossible or illegal, acts or omissions of other suppliers, strikes and labor disputes not brought on by any act or omission of the supplier, fire, flood, epidemics, quarantines, or freight embargoes.
- 23) **PROCESS TO TERMINATE**
 - a) The service provider shall not be reimbursed until services are compliant.
 - b) If services continue to remain non-compliant, Procurement will prepare a formal Letter of Warning addressing the contractor's Failure to Comply. Agreement language states "The City may terminate this Agreement upon seven (7) days written notice to the contractor."
 - c) If contractor fails to achieve required results within stated timeframe, Procurement will terminate the Agreement.
 - d) The City shall have the right to terminate this Agreement, without cause, upon twenty-one (21) days written notice to the contractor. The contractor shall be paid for all work performed in conformance with the Agreement through the effective date of the not for cause termination.

END OF GENERAL TERMS AND CONDITIONS FOR CONTRACTORS

WATER PUMPING STATIONS GENERATOR REPLACEMENT

SPECIAL TERMS AND CONDITIONS FOR CONTRACTED SERVICES

1. Background

The City of Wheaton is seeking bids from qualified contractors for the replacement of standby diesel-fueled engine-generators for emergency duty at two (2) water pumping stations as specified in the Project Manual.

2. Bid Documents

- a. The City of Wheaton's website, www.wheaton.il.us/bids/ is the official source for all documents related to this solicitation.
- b. Copies of the plans may be obtained from BHFX Digital Imaging, www.bhfxplanroom.com, upon a non-refundable payment of \$50.00 per set. Plans can only be purchased through BHFX Digital Imaging.

3. Timeframe

- a. Bid posted on April 10, 2017
- b. Mandatory Pre-Bid Meeting: Thursday, April 20, 2017, at 10:00 a.m.
 - i. Location: 615 Countryside Drive, Wheaton, IL; meeting will proceed to 1586 S. President Street. Interested bidders must provide their own transportation to travel between meeting sites.
- c. Last Date for Questions: Wednesday, April 26, 2017, at 12:00 pm local time
 - i. All questions concerning this solicitation shall be submitted via e-mail to the attention of the Procurement Officer, LStyczen@Wheaton.il.us. A written response in the form of a public addendum will be published on the City's website, www.wheaton.il.us/bids/
- d. Bid Responses Due: Wednesday, May 3, 2017, prior to 11:00 am local time
- e. Bid Award: May 2017
- f. Project Completion: Prior to April 30, 2018.

4. Liquidated Damages

- a. The City retains the right to demand liquidated damages if deadlines are not met.
- b. For this Agreement, the contractor agrees to compensate the City in the amount of \$500.00 per calendar day beyond the completion date specified.
- c. Any extensions agreed to by executed Change Orders will be considered in the application of Liquidated Damages.

5. Communications Plan

- a. The Contractor will coordinate project management with Al McMillen, Water Superintendent, at AMcmillen@Wheaton.il.us, or (630) 260-2092.
- b. The Contractor shall attend a pre-construction meeting with the City project manager prior to commencement of any work.
- c. The successful bidder must submit the following for approval at, or before, the pre-construction meeting:
 - i. Certificates of Insurance, Endorsements, and a Waiver of Subrogation
 - ii. Payment and Performance Bond
 - iii. Project schedule, including anticipated completion date
 - iv. List of all essential project personnel with job title and experience listed

6. Work Hours

- a. Monday – Friday 7:00am - 5:00pm (excluding City holidays) or with the approval of the Project Manager.
- b. The contractor shall notify the Project Manager at least 48 hours prior to initial start of operations, and prior to any temporary cessation and resumption of operations.

7. Prevailing Wage

- a. Illinois Prevailing Wage Act 820 ILCS does apply.
- b. Certified Payroll is required with each invoice.

Waivers of Lien

- c. The first Application for Payment shall be accompanied by the General Contractor's partial waiver of lien, called Waiver of Lien to Date, for the full amount of payment due.
- d. Each subsequent Application for Payment shall be accompanied by the General Contractor's Waiver of Lien to Date, plus the partial waivers of lien of Labor, Subcontractors and Material Suppliers who were included in the immediately preceding Application for Payment to the extent of that payment.
- e. The final Application for Payment must be accompanied by the Final Waiver of Lien for the full amount of the Contract from the General Contractor, Labor, Subcontractors, and Material Suppliers, including those who have not previously furnished such final waivers.

8. Bonds

- a. A Bid Bond / Bid Deposit of ten percent (10%) of the full contract price is required.
- b. A Payment and Performance Bond of one hundred ten percent (110%) of the full contract price is required for the faithful fulfillment of the agreement; for the protection of the City from all liens and damages arising out of the work.
- c. Bond Certificates must be submitted with the signed agreement, i.e. no later than ten (10) days after receipt of the award document.

9. Insurance Requirements

Reference Contract Addendum 1.

10. Cost Structure

- a. All of the work not specifically mentioned herein which is required to delivered the completed project as specified herein shall be included in the bid proposal.

11. Method of Payment: Partial payment based on progress.

Invoices

- a. A schedule of dates when pay requests must be submitted will be determined at the preconstruction meeting.
- b. All invoices must reflect the following applicable information: Agreement Number, name of the Project, name of the Contractor, and the services/deliverables with the price depicted in the same format as the offer.
- c. Lien waivers must be submitted with each invoice.
- d. The City shall withhold 10% retainage from each payment due the Contractor. Contract retainage shall be released upon final completion of all work and receipt of all documentation as required by the Agreement.
- e. All invoices are mailed to the attention of the Project Manager; City of Wheaton, PO Box 727, Wheaton, IL 60187.

Project Close Out

- f. Verification of quality and completion of service
- g. Completion of Punch List and all areas of non-compliance or incomplete tasks
- h. Review Liquidated Damages
- i. Review Retainage
- j. Final Payment: Prior to authorization of Final Payment, the following documents must be submitted:
 - i. Completed Waivers and Liens
 - ii. All Certified Payrolls
 - iii. Documented completion of the Punch List
 - iv. Statements of Warranty
 - v. Written approval of the City's Project Manager

END OF SPECIAL TERMS AND CONDITIONS FOR CONTRACTED SERVICES

**CITY OF WHEATON, ILLINOIS
COUNTRYSIDE AND PRESIDENT
WATER PUMPING STATIONS
GENERATOR REPLACEMENT**

PROJECT MANUAL

Baxter & Woodman, Inc.
Crystal Lake, IL
815.459.1260

Chicago, IL
815.459.1260

DeKalb, IL
815.459.1260

Grayslake, IL
815.459.1260

Mokena, IL
815.459.1260

Burlington, WI
815.459.1260

Madison, WI
608.277.1230

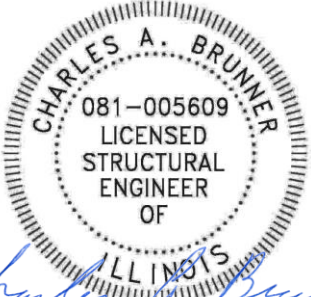
PROJECT TITLE PAGE
00 01 01 (160194.40)

00 01 07


SEALS PAGE

March 15, 2016

1. Specifications of materials and labor required for the construction work shown on the Drawings are prepared by Baxter & Woodman, Inc., Consulting Engineers.
2. The Drawings which accompany these Specifications are titled "City of Wheaton, Illinois – Countryside and President Water Pumping Stations Generator Replacement".
3. Copyright 2017 by Baxter & Woodman, Inc. All Rights Reserved. No part of these Specifications or the accompanying Drawings may be reproduced by any means, or otherwise reused without the prior written permission of Baxter & Woodman, Inc.



Charles A. Brunner
Structural Engineer
License Expires 11/30/2018



Harry D. Harman
Project Manager/Electrical Engineer
License Expires 11/30/2017

BAXTER & WOODMAN, INC.
STATE OF ILLINOIS – PROFESSIONAL DESIGN FIRM
LICENSE NO. – 184-001121 - EXPIRES 4/30/2017

SEALS PAGE
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SECTION 01 14 11

CONTRACTOR USE OF PREMISES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section applies to all situations in which the Contractor or his representatives including, but not necessarily limited to, suppliers, subcontractors, employees, and field engineers, enter upon the Owner's property.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- F. Provide a list of names and identification of all persons to be entering the Owner's property in connection with the Work of this Contract, and submit a copy of the list to the Owner at the preconstruction conference.
 - 1. Advise the Owner of personnel changes at project meetings.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not store construction equipment, tools or materials on any area of the Owner's property except where directed by the Engineer.

1.5 SITE CONDITIONS – Reserved.

CONTRACTOR USE OF PREMISES

01 14 11-1 (160194.40)

1.6 MAINTENANCE – Reserved.

1.7 USE AND RESTORATION OF THE SITE

- A. Construct and maintain temporary roadways from the existing public roadway to the site and within the entire site for material and equipment transport necessary to complete the work.
 - 1. Include necessary culverts for proper drainage.
 - 2. Obtain necessary permits for the construction of access temporary roadways.
 - 3. Obtain Engineer's approval for the location of the temporary roadways.
- B. Upon completion of the Work, restore areas used for temporary roadways to fully graded condition totally free of stones or crushed rock.
- C. Before submitting Final Application for Payment, restore all areas within the work site boundaries disturbed by the Work to a fully regraded condition, provided with at least four (4) inches of hand raked topsoil and sodded as specified under Section 32 92 00.16.
- D. Clean all permanent roadways used for construction activities by using motorized street sweeper that utilizes vacuum and water to pick up debris, when directed by Engineer.

1.8 CONTRACTOR'S INGRESS AND EGRESS

- A. Truck and Equipment access:
 - 1. To avoid traffic conflict with vehicles of the Owner's employees and customers, and to avoid overloading of streets and driveways elsewhere on the Owner's property, limit the access of trucks and equipment to the route directed by the Engineer.
 - 2. Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the work site.
- B. Contractor's vehicles:
 - 1. Require Contractor's vehicles, vehicles belonging to employees of the Contractor, and all other vehicles entering upon the Owner's property in performance of the Work, to use only the Access Route directed by the Engineer.
 - 2. Do not permit such vehicles to park on any street or other area of the Owner's property except in the area directed by the Engineer.
- C. Restoration: Clean and restore to at least the preconstruction condition all roadways, streets, sidewalks, driveways, and parking areas used during construction.

1.9 ACCESS TO OWNER'S FACILITIES

- A. Restricted areas and structures:
 - 1. Do not enter any designated restricted area or any existing structure, except as required to do specific work.

2. Obtain Owner's permission to enter restricted areas or existing structures to do specific work.
3. Remove all construction debris and clean work areas daily when working in restricted areas or existing structures.

B. Equipment:

1. Do not use Owner's equipment or tools.

1.10 PROTECTION OF EXISTING PROPERTY AND EQUIPMENT

A. Property:

1. Take all necessary precautions to protect existing structures, piping, trees and all other facilities from damage during construction, and comply with Section 31 23 39, paragraph 3.2 of these Specifications.
2. Repair or replace all property damaged during construction.
3. Prevent entry of all foreign materials including excavated earth and/or backfill into open tanks. Notify Engineer twenty-four (24) hours in advance of beginning work in the vicinity of any open tank. Immediately stop work and notify both Owner and Engineer in the event any tool, earth, rock, sand or other foreign materials enter into any tank. Before resuming work, empty the tank under the Owner's supervision, and, in accordance with the requirements of 1.8 herein, remove all foreign material.

B. Equipment:

1. Take all necessary precautions to protect all equipment from sand, dust, water and other debris which is produced during construction.
2. Wherever possible, cut concrete or masonry from outside the structure to prevent production of dust in areas containing equipment.
3. During dust-producing activities inside of structures, isolate work area from equipment using temporary impervious partitions or individual equipment encasement.
4. Under excessive dust conditions, ventilate isolated working areas as directed by Engineer.
5. Remove all temporary equipment protection facilities upon completion of construction activity requiring such protective measures.

1.11 DISPOSAL OF SPOIL

- A. Remove all spoil, excess excavated material, or other construction activity residual materials from the work site. Do not deposit this material on private or public property without written permission from property owner or authorized representative of the appropriate public agency.

1.12 SECURITY

- A. Restrict the access of all persons entering upon the Owner's property in connection with the Work to the Access Route and to the actual site of the Work.

END OF SECTION

CONTRACTOR USE OF PREMISES

01 14 11-3 (160194.40)

SECTION 01 14 15

PLANT OPERATION DURING CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Prepare and maintain a sequence of construction which will ensure the continuance during construction of the same degree of water production as is provided by the existing facility.
- B. Related work:
 - 1. Documents affecting the work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Lubricants – None Required.
- E. Spare Parts – None Required.
- F. Comply with pertinent provisions of Section 01 33 01.
- G. Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed and as a part of the construction schedule required by Section 01 32 16, submit a detailed sequence of construction showing how the new work will be completed without interruption of the existing treatment process.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 RAW SEWAGE BYPASSING - Reserved

PLANT OPERATION DURING CONSTRUCTION

01 14 15-1 (160194.40)

1.8 TEMPORARY EQUIPMENT

- A. Provide temporary generators to provide emergency power in the event of a loss of normal power at no additional cost to the Owner.

1.9 OPERATION OF TREATMENT FACILITIES

- A. The Owner will operate and maintain permanent facilities used for the distribution of water. No equipment or treatment unit shall be removed from service nor shall the power to any part of the plant be discontinued without the approval of the Engineer.

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INTERPRETATION

PART 1 - GENERAL

1.1 SUMMARY: REQUESTS FOR INTERPRETATION (RFI)

- A. The Contractor may submit Requests For Interpretation (RFI) to the Engineer to expedite the Contractor's performance on the Project. RFIs will be submitted following the requirements, all as described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
 - 2. Individual requirements for submittals will be described in pertinent Sections of these Specifications.
- C. Work not included:
 - 1. Incomplete submittals will not be reviewed by the Engineer.
 - 2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.
- D. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Make submittals of RFIs in accordance with the provisions of this Section.
- F. Prior to submitting each RFI, the Contractor shall first carefully study and compare the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information requested is not reasonably obtainable from such sources.

REQUESTS FOR INTERPRETATION

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- G. The Contractor shall submit each RFI sufficiently in advance of the date by which such information is required to allow the Engineer sufficient time, in the Engineer's professional judgement, to permit adequate review and response and to permit Contractor compliance with the latest construction schedule.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 This Subsection intentionally left blank.

PART 3 - EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

- A. Each RFI shall be submitted to the Engineer, in writing, on such form and with such accompanying information as the Engineer may require for such purpose. Each RFI shall identify the specific sources which were reviewed by the Contractor in its efforts to determine the information requested, and a statement to the effect that the information being requested could not be determined from such sources.
- B. Consecutively number all submittals.
 - 1. When material is submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
 - 2. On re-submittals, cite the original submittal number for reference.
- C. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
 - 1. Use Request for Interpretation (RFI) Form, Section 01 26 13.13.
- D. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
- E. Submittal log:
 - 1. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times, the date of the request, to whom the request was made, by whom the request was made, the nature of the request, and the Engineer's resolution thereof.

2. Make the submittal log available to the Engineer for the Engineer's review upon request.
3. Review this log at each Project Meeting and make the resolution of RFIs a part of the minutes of such meetings.

END OF SECTION

01 26 13.13

REQUEST FOR INTERPRETATION (RFI) FORM

RFI NO. _____

Contractor requests for interpretation will be considered upon receipt of this completed RFI Form. By submission of this form the Contractor attests to the fact that having carefully reviewed the Contract Documents and coordinated the Work with the appropriate trades and reviewed field conditions, that the information requested cannot be determined from such efforts as called for in the General Conditions of the Contract.

Date: _____ Project: _____

To: _____

Description of Requested Interpretation: _____

Specification References: _____

Drawing References: _____

Proposed method of resolving issue. Sketches and/or Pages Attached: _____ Yes, _____ No

Potential impact on project cost: _____

Response Date: _____ List date by which response by Engineer is requested to maintain project schedule. (Allow sufficient time for response).

Signed: _____, Project Superintendent
Signature signifies acceptance of responsibility for accuracy and completeness of information.

ENGINEER'S RESPONSE

Notations listed below indicate the Engineer's action on method proposed by the Contractor to resolve issues or remarks in response to RFI when no Contractor recommendation has been provided. Changes to Contract Amount and/or project time shall be processed using standard Change Order Forms. Sketches and/or Pages Attached _____ Yes _____ No

Signed: _____ Date: _____

REQUEST FOR INTERPRETATION (RFI) FORM

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SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Engineer will conduct project meetings throughout the construction period.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. The Contractor's relations with his subcontractors and material suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Agenda items: To the maximum extent practicable, advise the Engineer at least 24 hours in advance of project meetings regarding items to be added to the agenda.
- F. Minutes:
 - 1. The Engineer will compile minutes of each project meeting, and will furnish three copies to the Contractor and required copies to the Owner.
 - 2. Recipients of copies may make and distribute such other copies as they wish.

1.3 QUALITY ASSURANCE

- A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 No products are required in this Section.

PART 3 - EXECUTION

3.1 MEETING SCHEDULE

- A. Project meetings will be scheduled at the Preconstruction Meeting.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.2 MEETING LOCATION

- A. The Engineer will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

3.3 PRECONSTRUCTION MEETING

- A. Preconstruction Meeting will be scheduled to be held within 20 working days after the effective date of the Agreement.
 - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
 - 2. The Engineer will advise other interested parties, including the Owner, and request their attendance.
- B. Minimum agenda: Data will be distributed and discussed on at least the following items:
 - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Engineer.
 - 2. Channels and procedures for communications.
 - 3. Construction schedule, including sequence of critical work.
 - 4. Contract Documents, including distribution of required copies of original Documents and revisions.
 - 5. Processing of Shop Drawings and other data submitted to the Engineer for review.
 - 6. Processing of Bulletins, field decisions, and Change Orders.
 - 7. Rules and regulations governing performance of the Work; and
 - 8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

3.4 PROJECT MEETINGS

A. Attendance:

1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

END OF SECTION

SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

- A. Prepare and maintain the schedules and reports described in this Section to assure adequate planning and execution of the Work so that the Work is completed within the Contract Times, and to assist the Engineer in appraising the reasonableness of the proposed schedule and in evaluating progress of the Work.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Requirements for progress schedule: General Conditions.
 - 3. Construction period: Form of Agreement.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.
- F. Construction schedule: Prior to submission of the first Application for Payment, but no later than 30 calendar days after Contract Times commence, submit to the Engineer one reproducible copy and four prints of a construction schedule prepared in accordance with Part 3 of this Section.
- G. Periodic reports: Prior to submittal of Application for Payment for completed work coinciding with 50 percent and 80 percent of the Contract Price, submit to the Engineer four prints of the construction schedule updated as described in Part 3 of this Section.

1.3 QUALITY ASSURANCE

- A. Perform data preparation, analysis, charting, and updating in accordance with standards approved by the Engineer.

CONSTRUCTION PROGRESS SCHEDULES

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- B. Reliance upon the approved schedule:
 - 1. The construction schedule as approved by the Engineer will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
 - 2. Processing of the first Application for Payment will not be completed by the Engineer until the construction schedule has been submitted in accordance with 1.2 F. above.
 - 3. Processing of the 50 percent and 80 percent progress payment applications will not be completed by the Engineer until the periodic reports have been submitted in accordance with 1.2 G. above.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 CONSTRUCTION ANALYSIS

- A. Graphically show by Critical-Path (CPM), Program Evaluation and Review Technique (PERT), Precedence Methods, bar-chart, or other means acceptable to the Engineer, the order and interdependence of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent in coordination with all subcontractors whose work is shown on the diagram.
- B. Include, but do not necessarily limit indicated activities to:
 - 1. Project mobilization.
 - 2. Work elements.
 - 3. Special material and equipment installation and testing.
 - 4. Final cleanup.
 - 5. Final inspecting and testing.
 - 6. All activities by the Engineer that affect progress, required dates for completion, or both, for all and each part of the work.
 - 7. Contractor's anticipated working dates.

PART 3 - EXECUTION

3.1 CONSTRUCTION SCHEDULE

- A. As soon as practicable after receipt of Notice to Proceed, complete the construction schedule in preliminary form, meet with the Engineer, review contents of the proposed construction schedule, and make all revisions agreed upon.
- B. Submit in accordance with Paragraph 1.2 F. above.

3.2 PERIODIC REPORTS

- A. As required under Paragraph 1.2 G. above, update the approved construction schedule.
 - 1. Indicate "actual" progress in percent completion for each activity;
 - 2. Provide written narrative summary of revisions causing delay in the program, and an explanation of corrective actions taken or proposed.

3.3 REVISIONS

- A. Make only those revisions to approved construction schedule as are approved in advance by the Engineer.

END OF SECTION

SECTION 01 33 01

SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Individual requirements for submittals will be described in pertinent Sections of these Specifications.
 - a. The process for securing approval of proposed substitutions is described in Section 01 62 01, "Product Options and Substitutions".
- C. Work not included:
 - 1. Submittals not required by the various Specification Sections of the Contract Documents will not be reviewed by the Engineer.
 - 2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.
- D. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Provide submittals of Shop Drawings, Samples, Substitution Requests, progress schedules and other items required in the Contract Documents in accordance with the provisions of this Section.

1.3 QUALITY ASSURANCE

- A. Coordination of submittals:
 - 1. Review and coordinate all aspects of each item being submitted carefully prior to each submittal.
 - 2. Verify that each item and the submittal for it conform in all respects with the specified requirements.

SUBMITTALS

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3. Certify that this coordination has been performed by affixing the Contractor's signature to each Contractor's Submittal Transmittal Form Attachment 01 33 01.

B. Resubmittals and reimbursement of Engineer's costs.

1. The Engineer will record all time used by the Engineer in the review of any third and subsequent submittals.
2. The Owner will reimburse the Engineer at the Engineer's standard hourly rate for all time spent in such third and subsequent reviews and deduct such costs from payments due the Contractor.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 SHOP DRAWINGS

- A. Provide Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
 1. Shop Drawings are not required for manholes, valve vaults, catch basins, pipe, and appurtenances needed for infrastructure systems (storm sewers, sanitary sewers, and water distribution) so long as the items match the materials and manufacturers specified in the project manual.
- B. Submit Shop Drawings electronically to the Engineer as a single .pdf file set.
 1. Attach, as the first page of each Shop Drawing, a completely executed Contractor's Submittal Transmittal Form Attachment 01 33 01.
 2. Collate the electronic .pdf file to include all data pertaining to the Shop Drawing Submittal in one .pdf set.
 - a. Separate .pdf files submitted will be cause for rejection and the Shop Drawing will be returned to the Contractor.
- C. Submit all required shop drawings for a specification section at the same time under one Contractor's Submittal Transmittal Form Attachment 01 33 01.
- D. Do not submit partial submittals of an item within a specification section or use a separate Contractor's Submittal Transmittal Form Attachment 01 33 01 for separate items within a particular section.
- E. Identify exceptions or items that do not comply with the specifications and provide explanation for exception or non-compliance.

- F. For Shop Drawings required to be resubmitted for review, include the following:
1. A completely executed cover sheet Contractor's Submittal Transmittal Form Attachment 01 33 01.
 2. A cover letter responding to each of the review comments returned to the Contractor by the Engineer with the previous review and specifically stating:
 - a. If the equipment and resubmitted data provided complies with the review comment(s). If so, then the Contractor shall provide:
 - (1) How the equipment complies.
 - (2) Specifically indicate where support documentation can be located in the shop drawing.
 - b. If the equipment and resubmitted data provided cannot or does not comply with the review comment(s). If so, then the Contractor shall provide:
 - (1) What is being provided to comply instead.
 - (2) Justify why the Contractor feels the Engineer should consider it is acceptable not to allow the Contractor to not comply with the specification.
 3. Resubmission of a complete and fully-inclusive shop drawing with all data pertinent to the item(s) being submitted.
 - a. Partial submission of data that only addresses the Engineer's specific review comments, or a portion thereof, and does not include all data for a complete resubmittal, will be cause for immediate rejection.

2.2 MANUFACTURERS' LITERATURE

- A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly indicate which portion of the contents is being submitted for review by highlighting, circling, or other means, or by crossing out contents that do not pertain to the submittal and are not to be considered.
1. This also applies to specifically indicating, when applicable, which optional items will or will not be provided with items specified.

2.3 SAMPLES

- A. Provide Sample or Samples identical to the precise article proposed to be provided.
1. Identify as described under "Identification of submittals" below.
- B. Number of Samples required:
1. Unless otherwise specified, submit Samples in the quantity which is required to be returned, plus one which will be retained by the Engineer.
 2. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Engineer.
 3. Because submittals are submitted to the Engineer in an electronic format as described herein, specifically indicate on the Contractor's Submittal Transmittal Form Attachment 01 33 01 included with each submittal (when samples are required) when and where the physical samples will or have been transmitted for physical observation.

4. Include as part of the electronic submittal a .pdf copy of any and all transmittals, shipping information, signatures of receipt, etc. identifying the transmission and receipt of the said sample(s).

2.4 COLORS AND PATTERNS

- A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Engineer for selection.

2.5 MANUFACTURERS' RECOMMENDED INSTALLATION PROCEDURES

- A. Maintain in a safe place at the site one copy of manufacturers' recommended installation procedures for all equipment and materials.
 1. Make these installation procedures readily available to the Engineer for reference.
- B. When the manufacturers' recommended installation procedures are submitted as part of the shop drawings required by the Contract Documents, approval of such installation procedures by the Engineer will not be required.

PART 3 - EXECUTION

3.1 IDENTIFICATION OF SUBMITTALS

- A. Consecutively number all submittals beginning with identifying number "001" for the first submittal delivered by the Contractor.
 1. When items are submitted for any reason, transmit under a new Contractor's Submittal Transmittal Form Attachment 01 33 01 and with a new transmittal number.
 2. When material is resubmitted for any reason, cite the original identifying submittal number, and followed by insertion of a letter "A" for the first resubmittal, "B" for the second resubmittal, and so on.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
 1. Use Contractor's Submittal Transmittal Form, Attachment 01 33 01.
- C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

3.2 GROUPING OF SUBMITTALS

- A. Shop Drawings may be submitted for different specification sections under one Contractor's Submittal Transmittal Form Attachment 01 33 01, provided the items are specifically and directly related to each other such that review of the items from different specification sections is pertinent for a complete review.
 1. Identify any and all items and their specific specification section(s) if included with and submitted under a differing main specification section submittal.

2. Partial submittals may be rejected as not complying with the provisions of the Contract.
3. The Contractor may be held liable for delays so occasioned.
4. Do not submit unrelated items in group submittals.

3.3 ELECTRONIC SUBMITTAL PROCEDURES

A. Summary:

1. Transmit submittals to Engineer in electronic (.pdf) format using Submittal Exchange, a website service designed specifically for transmitting submittals between construction team members.

B. Setup:

1. Obtain and pay for the Submittal Exchange subscription for this Project.
 - a. Contact Glenn Van Treeck at Submittal Exchange at 515.393.2471 or glenn.vantreeck@oracle.com to verify cost prior to bid.
2. The Engineer will set up and define the requirements of the Project to be submitted, transmitted, and maintained through Submittal Exchange.
3. At Contractor's option, training is available from Submittal Exchange regarding use of website and .pdf submittals.
 - a. Contact Submittal Exchange at 515.393.2471.
4. Internet Service and Equipment Requirements:
 - a. Email address and Internet access at Contractor's main office.
 - b. Adobe Acrobat (www.adobe.com), Bluebeam PDF Revu (www.bluebeam.com), or other similar .pdf review software for applying electronic stamps and comments.

C. Procedures:

1. Submittal Preparation - Contractor may use any or all of the following options:
 - a. Subcontractors and Suppliers provide electronic (.pdf) submittals to Contractor via the Submittal Exchange website.
 - b. Subcontractors and Suppliers provide paper submittals to General Contractor who electronically scans and converts to .pdf format.
 - c. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to .pdf format.
2. Review and certify by signature that the submittal complies with the requirements of the Contract Documents including verification of manufacturer/product, dimensions and coordination of information with other parts of the work.
3. Transmit each submittal to Engineer using the Submittal Exchange website, www.submittalexchange.com.
4. Engineer review comments will be made available on the Submittal Exchange website for downloading.
5. Contractor will receive email notice of completed review.
6. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.

- D. Project Close-out:
 - 1. Submit three copies of the complete record of Submittal Exchange documents in .pdf format to the Engineer at the end of the Project.
 - a. Provide each copy on a separate flash drive.

3.4 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
- B. In scheduling, allow at least ten working days for review by the Engineer following the Engineer's receipt of the submittal.

END OF SECTION

ATTACHMENT 01 33 01

CONTRACTOR'S SUBMITTAL TRANSMITTAL FORM

TO: BAXTER & WOODMAN, INC.
8678 RIDGEFIELD ROAD
CRYSTAL LAKE, IL 60012

DATE: _____

ATTN: _____

PROJECT NAME: _____

FROM: _____ SPEC NO. _____

ENGR. DWG. NOS. _____

TRANSMITTAL NO. _____

1. The following submittals are forwarded for your review:

<u>No. of Copies</u>	<u>Manufacturer</u>	<u>Description</u>	<u>Drawing No.</u>	<u>Date</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

2. Have all field measurements, field construction criteria, materials, dimensions, catalog numbers, and similar data been determined and verified? Yes ____ No ____
3. Has work indicated in this submittal been coordinated with all trades? Yes ____ No ____
4. Is work by all trades being provided as necessary to accommodate this submittal? Yes ____ No ____
5. Contractor has approved submittal and has affixed his certification stamp. Yes ____ No ____
6. Contractor's description and justification for deviations from Contract Documents.
(Use additional sheet if necessary.)

7. Remarks: _____

Signature: _____

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SECTION 01 41 26

PERMITS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes permit requirements for building, generator removal and underground tank removal.
- B. Related Sections:
 - 1. Documents affecting work of this Section include, but are not necessary limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Other permits requirements may also be described in other Sections of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PERMITS

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1.7 PERMITS

- A. Obtain all permits required, and pay all inspection fees for the respective work requiring such permits.

1.8 NPDES PHASE II STORMWATER PERMIT

- A. Not applicable. The project involves less than 1.0-acre of disturbed area.

END OF SECTION

SECTION 01 42 13

ABBREVIATIONS AND ACRONYMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes abbreviations referenced in the Contract Documents.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 ABBREVIATIONS

- A. Referenced Standards:
 - 1. Where the Contract Documents reference any published specifications or standards of any organization or association, comply with the requirements of the specification or standards which are current on the date of Advertisement for Bids. In case of a conflict between the referenced

ABBREVIATIONS AND ACRONYMS

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specifications or standards, the one having the more stringent requirements shall govern.

2. In case of conflict between the referenced specifications or standards and the Contract Documents, the Contract Documents shall govern.

B. Abbreviations:

1. The following are definitions of abbreviations that may be used within the Project Manual:

AA - Aluminum Association

AASHTO - American Association of State Highway and Transportation Officials

ACI - American Concrete Institute

AISC - American Institute of Steel Construction

ANSI - American National Standard Institute

ASTM - American Society for Testing and Materials

AWG - American Wire Gauge

AWS - American Welding Society

AWWA - American Water Works Association

CBM - Certified Ballast Manufacturers Association

CRSI - Concrete Reinforcing Steel Institute

ICEA - Insulated Cable Engineers Association

IEEE - Institute of Electrical and Electronics Engineers, Inc.

ISA - Instrument Society of America

FS - Federal Specifications

NAPF – National Association of Pipe Fabricators

NEC - National Electrical Code (NFPA 70)

NECA - National Electrical Contractors' Association

NEMA - National Electrical Manufacturer's Association

NFPA - National Fire Protection Association or National Forest Products Association

NSF - National Sanitation Foundation

OSHA - U.S. Department of Labor, Occupational Safety and Health Department

PS - United States Products Standards

IDOT "STANDARD SPECIFICATIONS" - Illinois Department of Transportation "Standard Specifications for Road and Bridge Construction" including Recurring Special Provisions and Interim Special Provisions.

SSPC – Society for Protective Coatings

UL - Underwriter's Laboratories, Inc.

END OF SECTION

SECTION 01 45 29

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes testing to be provided by an independent testing laboratory service.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Requirements for specific tests will be described in various Sections of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Provide the services of a testing laboratory approved by the Engineer.
- B. Upon completion of each test and/or inspection, promptly distribute copies of test or inspection reports to the Engineer, to governmental agencies requiring submission of such reports, and to such other persons as directed by the Engineer.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

TESTING LABORATORY SERVICES

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1.7 TESTING AGENCY DUTIES AND LIMITS OF AUTHORITY

- A. Cooperate with the Engineer and the Contractor; provide qualified personnel and equipment to perform the scope of testing work outlined.
- B. Acquaint the Engineer and the Contractor with testing procedures for special conditions encountered at the site.
- C. Perform specified monitoring, sampling, and testing of the materials and construction.
 - 1. Comply with specified standards, ASTM, other authorities, and as specified.
 - 2. Ascertain compliance with the Contract Documents.
 - 3. Obtain written acknowledgment of sampling or testing.
- D. Give prompt written notice to the Engineer and the Contractor of irregularities or deficiencies of work which are observed during performance of service.
- E. The Laboratory is not authorized to release, revoke, alter or enlarge the Contract requirements, or to approve or accept any portion of the work, or to perform the duties of the Contractor.

PART 2 - PRODUCTS

2.1 PAYMENT FOR TESTING

- A. Include within the Contract Price an amount sufficient to cover all testing required of the Contractor under pertinent Sections of these Specifications, and to cover all testing and inspecting required by governmental agencies having jurisdiction.
- B. The Owner will pay for all testing and inspecting specifically requested by the Engineer over and above those described in Paragraph 2.1 A. above.
- C. When tests indicate noncompliance with the Contract Documents, all testing and subsequent retesting occasioned by the noncompliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.

PART 3 - EXECUTION

3.1 TAKING SPECIMENS

- A. Except as may be specifically otherwise approved by the Engineer, have the testing laboratory secure and handle all samples and specimens for testing.

3.2 COOPERATION WITH TESTING LABORATORY

- A. Provide access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.
- B. Furnish casual labor and facilities:
 - 1. To obtain and handle samples at the site or at the source of the product to be tested.
 - 2. To facilitate testing operations.
 - 3. For laboratory's exclusive use for storage and curing of test samples on site.
- C. Notify the testing agency sufficiently in advance of operations to allow for assignment of personnel and scheduling of its operations.
- D. Provide the testing laboratory with copies of approved relevant shop drawings.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes construction facilities and temporary controls required for the Work.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Comply with pertinent safety requirements and regulations for temporary facilities and controls.
 - 3. Equipment normally furnished by the individual trades in execution of their own portions of the Work is not part of this Section.
 - 4. Permanent installation and hookup of the various utility lines are described in other Sections.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

TEMPORARY FACILITIES AND CONTROLS

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1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 REQUIREMENTS

- A. Provide construction facilities and temporary controls needed for the Work including, but not necessarily limited to:
 - 1. Temporary utilities and services such as water, electricity and heat.
 - 2. Sanitary facilities.
 - 3. Enclosures such as fencing, tarpaulins, barricades, and canopies.
 - 4. Temporary fencing of the construction site.
 - 5. Fire extinguishers.
 - 6. Dust and mud control.
 - 7. Security.

PART 2 - PRODUCTS

2.1 UTILITIES AND SERVICES DURING CONSTRUCTION

- A. Electricity:
 - 1. Provide necessary temporary wiring and, upon completion of the Work, remove such temporary facility.
 - 2. Provide and pay for electricity used in construction.
- B. Heating: Provide and maintain heat necessary for proper conduct of operations needed in the Work.

2.2 SANITARY FACILITIES

- A. Provide temporary sanitary facilities meeting federal, state, and local health department requirements.
 - 1. Maintain in a sanitary condition at all times.

2.3 ENCLOSURES

- A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

2.4 TEMPORARY FENCING

- A. Provide and maintain for the duration of construction a temporary fence of design and type needed to prevent entry onto the Work by the public.
- B. Temporary work boundary fence (standard).
 - 1. Provide fence 36-inch to 48-inch in height.
 - a. Material: Polyethylene, PVC, or wood lath.

TEMPORARY FACILITIES AND CONTROLS

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2. Provide steel or wood posts.
 - a. Height: To support fence for total height after being driven.

2.5 FIRE EXTINGUISHERS

- A. Provide and maintain not less than two fire extinguishers, multi-purpose dry chemical type with UL rating of 4A-60 B:C, 10-pound capacity, Amerex Model ABC, or equal, enclosed in suitable protecting cabinets and conveniently located for proper protection.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.
- B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Engineer.

3.2 SECURITY

- A. Take whatever measures are necessary to protect the safety of the public, workmen, and materials.
 1. Provide inspection of work area daily.
 2. Provide the security of the site, both day and night.

3.3 RIGHT-OF-WAY AND PROPERTY LINE CONTROL

- A. Protect all right-of-way markers, property line iron pins, and easement iron pins during construction.
 1. Flag such control points prior to construction, and protect the points during the course of construction.
- B. Establish tie-down control for any right-of-way markers or iron pins that may be lost or damaged during the work.
- C. Re-establish any right-of-way markers or iron pins that are lost or damaged during construction, after completion of restoration work.
- D. Provide the services of a Registered Land Surveyor for replacement of lost markers and pins.
 1. The cost for this work will be considered incidental to the Contract, and no additional compensation will be allowed.

END OF SECTION

SECTION 01 61 01

GENERAL EQUIPMENT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes the general equipment requirements applicable to all equipment and supplements the detailed equipment specifications.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Sections 01 33 01 and 01 78 26.
- F. Submit manufacturer's certificate of inspection, Contractor's verification of equipment inspection, and Contractor's equipment guarantee as specified herein.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

GENERAL EQUIPMENT REQUIREMENTS

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PART 2 - PRODUCTS

2.1 LUBRICANTS

- A. Provide lubricants of the type recommended by the equipment manufacturer for each item of equipment in sufficient quantity for one year of normal operation and maintenance.
- B. Provide lubrication fittings readily accessible from the outside of all equipment without removing covers or guards.

2.2 ANCHORS

- A. Provide the size and number of anchor bolts, mechanical anchors and adhesive anchors determined by the equipment manufacturer unless otherwise indicated on the Drawings.
- B. Provide Type 316 stainless steel anchor bolts, threaded rods, nuts, washers, mechanical anchors, adhesive anchors, and other fastener parts for installing equipment, complying with ASTM F593 and F594.
- C. Comply with pertinent provisions of Section 05 50 00.

PART 3 - EXECUTION

3.1 SHOP ASSEMBLY AND MATCHMARKING

- A. Assemble, inspect, and test equipment in the manufacturer's shop as far as is practical.
- B. Provide accurate shopmarking and identification for items to be field erected in accordance with erection details furnished with the equipment.
- C. Provide all fasteners and miscellaneous small parts to be field erected individually packaged for shipment, and identify as to location in accordance with a schedule of fasteners with the equipment.

3.2 INSTALLATION, INSPECTION, TESTING AND OPERATOR INSTRUCTIONS

- A. Provide the services of a qualified serviceman from the manufacturer of each piece of equipment to:
 - 1. Inspect the equipment installation including alignment, clearances, field erection where applicable, and initial lubrication where applicable.
 - 2. Ascertain that the installation is properly completed.
 - 3. Instruct the Owner's personnel in the proper operation and maintenance of the equipment in accordance with the manufacturer's recommendations.

- B. Make all changes or adjustments that may be required for a complete and proper installation and operation.
- C. After the installation has been completed in accordance with the manufacturer's instructions and in the presence of the manufacturer's serviceman, test the equipment and its appurtenances for proper operating condition and for performance in accordance with these Specifications, subject to the Engineer's approval.
- D. Provide three (3) copies of the manufacturer's certificate of inspection and the Contractor's verification of equipment inspection to the Engineer certifying and verifying that the equipment and all appurtenances supplied with it have been installed in accordance with the manufacturer's recommendations and that the test operation was satisfactory.
 - 1. Use the form, Attachment 01 61 01-1.

3.3 EQUIPMENT GUARANTEE

- A. Guarantee all equipment, motors, electrical controls, and other mechanical devices to operate in accordance with the requirements of these Specifications and replace and repair any guaranteed item found to be defective within two years, or longer period if specifically stated for any particular item, from the date of the Owner's acceptance for use of the equipment without additional expense to the Owner for labor or materials.
 - 1. After obtaining Owner Authorized Representative's signature, provide three (3) copies of a Contractor's equipment guarantee to the Engineer, using the form, Attachment 01 61 01-2.

END OF SECTION

ATTACHMENT 01 61 01-1**MANUFACTURER'S CERTIFICATE OF INSPECTION**

Date: _____
Project: _____
Contractor: _____
Manufacturer: _____
Equipment: _____

This will certify that I have completely checked and inspected the installation of this equipment and it has been properly installed in accordance with our instructions and requirements. I also certify that the equipment has been satisfactorily tested and is now ready for normal operation and use.

I have instructed the Owner's operator, _____,
in the proper operation and maintenance of the equipment which we have furnished for this project.

Manufacturer's Representative's Signature

Name and Title

CONTRACTOR'S VERIFICATION OF EQUIPMENT INSPECTION

Date: _____
Project: _____
Contractor: _____
Manufacturer: _____
Equipment: _____

We, the Contractor for the subject project, hereby verify that the equipment manufacturer's serviceman has inspected and tested the installation of this equipment within the last 30 days and has certified that the equipment which we have furnished and installed for this project is now ready for normal operation and use by the Owner.

Contractor's Representative's Signature

Name and Title

ATTACHMENT 01 61 01-2

CONTRACTOR'S EQUIPMENT GUARANTEE

Date: _____
Project: _____
Contractor: _____
Manufacturer: _____
Equipment: _____

We, the Contractor for the subject project, hereby guarantee this equipment for a period of _____ years from the date of the Owner's acceptance and use of this equipment, and shall replace or repair the equipment or any parts thereof which become defective or do not function properly during normal operation and maintenance without any additional expense to the Owner for labor or materials.

Contractor's Representative's Signature

Name and Title

ACCEPTED this _____ day of _____, 20____, for Owner's use.

Owner's Representative's Signature

Name and Title

SECTION 01 62 01

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes product options available to bidders and the Contractor, plus procedures for securing approval of proposed substitutions.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Make submittals after Effective Date of the Agreement in accordance with pertinent provisions of Section 01 33 01.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Promptly upon award of the Contract, notify all pertinent personnel regarding requirements of this Section.
- B. Require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 PRODUCT OPTIONS

- A. The Contract is based on standards of quality established in the Contract Documents.
 - 1. In agreeing to the terms and conditions of the Contract, the Contractor has accepted a responsibility to verify that the specified products will be available and to place orders for all required materials in such a timely manner as is needed to meet his agreed construction schedule.

PRODUCT OPTIONS AND SUBSTITUTIONS

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2. Neither the Owner nor the Engineer has agreed to the substitution of materials or methods called for in the Contract Documents, except as they may specifically otherwise state in writing.
- B. Materials and/or equipment specified by name:
1. Where materials and/or equipment are specified by naming one single manufacturer and/or model number, followed by words that indicate no substitution is permitted, only the material and/or equipment named is approved for incorporation into the Work.
 2. Should the Contractor demonstrate to the approval of the Engineer that a specified material or method was ordered in a timely manner and will not be available in time for incorporation into this Work, the Contractor shall submit to the Engineer such data on proposed substitute materials and/or equipment as are needed to help the Engineer determine suitability of the proposed substitution.
- C. Where materials and/or equipment are specified by name and/or model number, followed by the words "or equal":
1. The material and/or equipment specified by name establishes the required standard of quality.
 2. Materials and/or equipment proposed by the Contractor to be used in lieu of materials and/or equipment so specified by name shall in all ways equal or exceed the qualities of the named materials and/or equipment.
 3. The Contractor may propose "substitute" or "or equal" items for non-major equipment in accordance with Paragraph 6.05 of the General Conditions.
 - a. If in the Engineer's sole discretion an item of material or equipment proposed by the Contractor does not qualify as an "or equal" item, the Engineer will notify the Contractor in writing that the item will be considered as a "substitute" item. If the Contractor wishes for the Engineer to continue the evaluation, the Contractor shall submit additional information in accordance with Paragraph 6.05.A.2 of the General Conditions.
 4. The Engineer will record all time used by the Engineer to evaluate proposed substitute items. Owner will reimburse the Engineer at the Engineer's standard hourly rate for all time spent evaluating proposed substitute items and deduct such costs from payments due the Contractor. Costs associated with review of proposed "or equal" items will not be charged to the Contractor.
- D. Products specified by reference to standard specifications such as ASTM and similar standards do not require submittal except for interface within the Work.

1.8 DELAYS

- A. Delays in construction arising by virtue of the non-availability of a specified material and/or method will not be considered by the Engineer as justifying an extension of the agreed Contract Time.

END OF SECTION

PRODUCT OPTIONS AND SUBSTITUTIONS

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SECTION 01 66 11

STORAGE AND PROTECTION OF MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Additional procedures also may be prescribed in other Sections of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the requirements of this Section for off-site storage.
 - 1. The Engineer reserves the right to inspect the off-site storage areas.
- B. Store equipment and materials in accordance with the manufacturer's instructions.
- C. Provide temporary weathertight enclosures to protect products from damage by the elements.
- D. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

STORAGE AND PROTECTION OF MATERIAL & EQUIPMENT

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1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the Engineer, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.8 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality, and other pertinent information.

1.9 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Engineer and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work required to:
 - 1. Make the several parts fit properly.
 - 2. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
 - 3. Remove and replace work not conforming to requirements of the Contract Documents.
 - 4. Remove and replace defective work.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. In addition to other requirements specified, upon the Engineer's request uncover work to provide for inspection by the Engineer of covered work, and remove samples of installed materials for testing.
 - 3. Do not cut or alter work performed under separate contracts without the Engineer's written permission.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Request for Engineer's consent:
 - 1. Prior to cutting which affects structural safety, submit written request to the Engineer for permission to proceed with cutting.
 - 2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Engineer and secure his written permission and the required Change Order prior to proceeding.

- F. Notices to the Engineer:
 - 1. Prior to cutting and patching performed pursuant to the Engineer's instructions, submit cost estimate to the Engineer. Secure the Engineer's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.
 - 2. Submit written notice to the Engineer designating the time the Work will be uncovered, to provide for the Engineer's observation.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

2.2 PAYMENT FOR COSTS

- A. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is submitted by the Contractor. Perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
 - 1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
 - 2. After uncovering the work, inspect conditions affecting installation of new work.
- B. Discrepancies:
 - 1. If uncovered conditions are not as anticipated, immediately notify the Engineer and secure needed directions.
 - 2. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION PRIOR TO CUTTING

- A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.3 PERFORMANCE

- A. Perform required excavating and backfilling as required under pertinent other Sections of these Specifications.
- B. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.
- C. Perform fitting and adjusting of products to provide finished installation complying with the manufacturer's recommendations for specified equipment, products, tolerances, and finishes.
- D. Perform slight alterations needed to make adjustable parts fit to fixed parts to provide a complete installation.
- E. Refinish surfaces as necessary to match adjacent finishes.

END OF SECTION

SECTION 01 74 23

FINAL CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. In addition to standards described in this Section, comply with requirements for cleaning as described in other pertinent Sections of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.
- B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

- A. General:
 - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
 - 2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
 - 3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
 - 4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the environment.
- B. Site:
 - 1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of Paragraph 3.1 A. 1. above.
 - 3. Maintain the site in a neat and orderly condition at all times.
- C. Structures:
 - 1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, sweep interior spaces clean.
 - a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
 - 3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

3.2 FINAL CLEANING

- A. "Clean", for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

- B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Paragraph 3.1 above.
- C. Site:
 - 1. Unless otherwise specifically directed by the Engineer, broom clean paved areas on the site and public paved areas adjacent to the site.
 - 2. Completely remove resultant debris.
- D. Structures:
 - 1. Exterior:
 - a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
 - d. In the event of stubborn stains not removable with water, the Engineer may require light sandblasting or other cleaning at no additional cost to the Owner.
 - 2. Interior:
 - a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed material from adjacent surfaces.
 - c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
- E. Schedule final cleaning as approved by the Engineer to enable the Owner to accept a completely clean Work.

END OF SECTION

SECTION 01 77 01
CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes an orderly and efficient transfer of the completed Work to the Owner.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Activities relative to Substantial Completion and Contract closeout are described in the General Conditions.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Prior to requesting that the Engineer issue a certificate of Substantial Completion in accordance with Paragraph 14.04 or 14.05 of the General Conditions, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for a joint inspection by Owner, Contractor, and Engineer.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

1.7 PROCEDURES

- A. Substantial Completion:
 - 1. Prepare and submit the list required by the first sentence of Paragraph 14.04.A of the General Conditions and submit it along with a written request that Engineer issue a certificate of Substantial Completion.

2. Within a reasonable time after receipt of the list, Owner, Contractor and Engineer will jointly inspect the Work to determine status of completion.
3. Should the Engineer determine that the Work is not substantially complete:
 - a. The Engineer will so notify the Contractor, in writing, giving the reasons therefore.
 - b. Remedy the deficiencies and notify the Engineer when ready for reinspection.
 - c. Owner, Contractor and Engineer will reinspect the Work.
4. When the Engineer concurs the Work is substantially complete:
 - a. The Engineer will prepare a tentative "Certificate of Substantial Completion," accompanied by the Contractor's list of items to be completed or corrected, as verified by the Engineer.
 - b. The Engineer will submit the tentative Certificate to the Contractor for acceptance.
 - c. After Contractor signs and returns the tentative Certificate to Engineer, Engineer will submit the tentative Certificate to Owner accompanied by a list of items to be completed or corrected before final payment.
 - d. Owner will have seven days after receipt of the tentative Certificate during which to make objection to Engineer as to any provisions of the Certificate on attached list.
 - (1) If Owner objects, Engineer will consider Owner's objections. If, after considering Owner's objections, Engineer concludes that the Work is not substantially complete, Engineer will, within fourteen days after submission of the tentative Certificate to Owner, notify Contractor in writing, stating reasons therefore. If, after considering Owner's objections, Engineer considers the Work substantially complete, Engineer will within said fourteen days execute and deliver to Owner and Contractor, a definitive Certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative Certificate as Engineer believes justified after consideration of any objections of Owner.
 - (2) If Owner has no objections, Engineer will within fourteen days after submission of the tentative Certificate to Owner and Contractor issue a definitive Certificate of Substantial Completion.
 - e. At the time of delivery of the tentative Certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, maintenance, heat, utilities, insurance, warranties, and guarantees. Unless Owner or Contractor advises the Engineer in writing of any objections within seven days after delivery of the tentative Certificate of Substantial Completion, the Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

- B. Final Completion:
1. Prepare and submit the notice required by the first sentence of Paragraph 14.06A of the General Conditions.
 2. Verify that the Work is complete including, but not necessarily limited to, the items mentioned in Paragraph 14.07.A of the General Conditions.
 3. Certify that:
 - a. Contract Documents have been reviewed.
 - b. Work has been inspected for compliance with the Contract Documents.
 - c. Work has been completed in accordance with the Contract Documents.
 - d. Equipment and systems have been tested as required, and are operational.
 - e. Work is completed and ready for final inspection.
 4. Owner, Contractor, and Engineer will make a joint inspection to verify status of completion.
 5. Should the Engineer determine that the Work is incomplete or defective:
 - a. The Engineer will so notify the Contractor, in writing, listing the incomplete or defective work.
 - b. The Contractor will remedy the deficiencies promptly, and notify the Engineer when ready for reinspection.
 6. When the Engineer determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.
- C. Closeout submittals include, but are not necessarily limited to:
1. Project Record Documents described in Section 01 78 39.
 2. Manufacturer's Certificate of Inspection, Contractor's Verification of Equipment Inspection, and Contractor's Equipment Guarantee for each item of equipment as required in Section 01 61 01.
 3. Warranties and bonds.
 4. Keys and keying schedule.
 5. Spare parts and materials extra stock.
 6. Certificates of Insurance for products and completed operations;
 7. Evidence of payment and release of liens; and
 8. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.
- D. Final adjustment of accounts:
1. Submit a final statement of accounting to the Engineer, showing all adjustments to the Contract Price.
 2. If so required, the Engineer will prepare a final Change Order showing adjustments to the Contract Price which have not been made by previous Change Orders.

END OF SECTION

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SECTION 01 78 26

OPERATION AND MAINTENANCE MANUAL

PART 1 - GENERAL

1.1 SUMMARY

- A. To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding products incorporated into the Work, furnish and deliver the manuals described in pertinent Sections of these Specifications.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.
- F. Submit five copies of the required manuals for each item of equipment to the Engineer no later than 30 days following the Engineer's approval of shop drawings for said item of equipment.

1.3 QUALITY ASSURANCE

- A. Use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this Section, and skilled in technical writing to the extent needed for communicating the essential data.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE MANUALS

- A. Where operation and maintenance manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.
- B. Format:
 - 1. Size: 8-1/2" x 11".
 - 2. Paper: White bond, at least 20 lb. weight.
 - 3. Text: Neatly written or printed.
 - 4. Drawings: 11" in height preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the manual and provide a drawing pocket inside rear cover or bind in with text.
 - 5. Flysheets: Separate each portion of the manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
 - 6. Binding: Use heavy-duty plastic or fiberboard covers with binding mechanism concealed inside the manual; 3-ring binders will be acceptable.
 - 7. Measurements: Provide all measurements in U.S. standard units such as feet-and-inches, lbs, and cfm; where items may be expected to be measured within ten years in accordance with metric formulas, provide additional measurements in the "International System of Units" (SI).
- C. Provide front and back covers for each manual, using durable material, and clearly identified on or through the cover with at least the following information:

OPERATING AND MAINTENANCE MANUALS

()
(Name and address of Work)
()
(name of Contractor)
()
(general subject of this Manual)
()
(Engineer, and approval date)

- D. Contents: Include at least the following:
 - 1. Neatly typewritten index near the front of the manual, giving immediate information as to location within the manual of all emergency information regarding the installation.
 - 2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.
 - 3. Complete nomenclature of all parts of the equipment.

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4. Complete nomenclature and part number of all replaceable parts, name and address of nearest vendor, and all other data pertinent to procurement procedures.
5. Manufacturers' bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturers' data with which this installation is not concerned.
6. Such other data as required in pertinent other Sections of these Specifications.

PART 3 - EXECUTION

3.1 TIMING AND PAYMENT

- A. Make submittals far enough in advance of scheduled dates for equipment installation to provide at least ten (10) working days for review by the Engineer following the Engineer's receipt of the submittal.
- B. Payment for the fabrication, delivery, or installation of any equipment will be withheld until the Engineer has received the required operation and maintenance manual(s).

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Paragraph 3.1 below and, upon completion of the Work, submit the recorded changes as described in Paragraph 3.2 below.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.
- F. The Engineer's approval of the current status of Project Record Documents may be a prerequisite to the Engineer's approval of requests for progress payment and request for final payment under the Contract.
- G. Prior to submitting each request for progress payment, secure the Engineer's approval of the current status of the Project Record Documents.
- H. Prior to submitting request for final payment, submit the final Project Record Documents to the Engineer and secure his approval.

1.3 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Engineer.

PROJECT RECORD DOCUMENTS

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- B. Accuracy of records:
 - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
 - 2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
- C. Make entries within 24 hours after receipt of information that the change has occurred.
- D. Do not conceal any work until the required information is recorded.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Engineer's approval.
 - 1. Such means shall include, if necessary in the opinion of the Engineer, removal and replacement of concealing materials.
 - 2. In such case, provide replacements to the standards originally required by the Contract Documents.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 RECORD DOCUMENTS

- A. Job set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Engineer at no charge to the Contractor one complete set of all Documents comprising the Contract.

PART 3 - EXECUTION

3.1 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the job set described in Paragraph 2.1 A. above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET".

- B. Preservation:
 - 1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set.
 - 2. Do not use the job set for any purpose except entry of new data and for review by the Engineer.
 - 3. Maintain the job set at the site of Work where designated by the Engineer.
- C. Making entries on Drawings:
 - 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
 - 2. Date all entries.
 - 3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
 - 4. In the event of overlapping changes, use different colors for the overlapping changes.
- D. Make entries in the pertinent other Documents as approved by the Engineer.
- E. Conversion of schematic layouts:
 - 1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.
 - a. Final physical arrangement is determined by the Contractor, subject to the Engineer's approval.
 - b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
 - 2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in Paragraph 3.1 E. 1. above.

3.2 REVIEW AND SUBMITTAL

- A. Submit the completed set of Project Record Documents to the Engineer as described in Paragraph 1.2 H. above.
- B. Participate in review meetings as required.
- C. Make required changes and promptly deliver the final Project Record Documents to the Engineer.

3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION

SECTION 02 41 53

DEMOLITION, REMOVAL AND ABANDONMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes demolition and removal of structures and parts of structures, removal of above grade and underground improvements, and abandonment of underground structures and pipelines as shown on the Drawings and specified in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

DEMOLITION, REMOVAL AND ABANDONMENT

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1.7 DEFINITIONS

- A. Demolish – Raze and dispose of above grade structures; including, but not limited to walls, roofs, ceilings, and ground floor slabs and floors. Raze and dispose of all equipment, piping and plumbing, electrical and communications conduit, wires and cables, furniture, furnishings, windows, and doors in above grade and below grade structures.
- B. Remove – Excavate structure foundations, tanks, underground pipes, etc. in their entirety.
- C. Dispose – Transport or haul materials and equipment of any and all types to off-site location(s).
- D. Abandon – Remove structure foundations, tanks, and underground pipes, etc within the following limits
 - 1. 5 feet horizontally from any proposed structure or pipe, and
 - 2. 3 feet vertically below the proposed finished grade or the outside edges of any proposed structure or pipe.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide materials, not specifically described but required for proper completion of the work of this Section, as selected by the Contractor subject to the approval of the Engineer.
- B. Grout for filling of abandoned pipes and structures:
 - 1. Cellular grout:
 - a. Low density cellular concrete capable of being mixed on site and pumped into place through a 2-inch hose.
 - b. Foaming agent complying with ASTM C869.
 - c. Portland Cement: ASTM C150, Type I or Type II.
 - d. Contents: Cement, fly ash, water and foaming agent.
 - e. Minimum net density: 70 pounds per cubic foot.
 - f. Acceptable manufacturer:
 - (1) Mearl Geofoam Liquid Concentrate.
 - (2) Or equal.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PROTECTION

- A. Protect existing utilities indicated or made known.
- B. Protection of persons and property:
 - 1. Barricade open depressions and holes occurring as part of this Work, and post warning lights on property adjacent to or with public access.
 - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 - 3. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this Section.
- C. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- D. Maintain access to the site at all times.

3.3 DEMOLITION

- A. General:
 - 1. By careful study of the Contract Documents and visiting the site, determine the location and extent of demolition to be performed.
 - 2. In all activities, comply with pertinent regulations of governmental agencies having jurisdiction.
- B. Demolition of existing structures:
 - 1. Demolish and remove existing structures, piping and equipment or parts thereof in a manner such as not to damage corresponding items which are to remain.
- C. Existing equipment:
 - 1. Existing mechanical or electrical equipment, miscellaneous metals, pipe, fittings, valves, and other materials of whatever nature are, and shall remain, the property of the Owner.
 - a. Dispose of items as directed in writing by the Owner's representative.

3.4 ABANDONMENT OF STRUCTURES AND PIPING

- A. Structures:
 - 1. In those areas where structures do not now occupy space to be used for proposed structures, remove structures to a depth of not less than 3 feet below finished grade.
 - 2. Plug piping which may remain in part as specified above with cellular grout for the length of pipe to remain in place, and to be abandoned.

3.5 DISPOSAL

- A. General:
 - 1. Dispose of all debris from demolition work.
 - 2. Dispose away from the site in a legal manner.
 - 3. Do not store or accumulate debris at the job site.
- B. Do not burn debris at the site.
- C. Prepare documentation identifying the hauler, generator, place of origin of debris or soil, the weight or volume of debris or soil, and the location, owner, and operator of the facility where debris or soil was transferred, disposed, recycled or treated. Maintain documentation for three years.

3.6 UTILITIES

- A. Coordinate with utility companies and agencies as required.
- B. Where utility cutting, capping, or plugging is required, pay utility company to do the work, or perform such work in accordance with requirements of the utility company or governmental agency having jurisdiction.
 - 1. Payment to Contractor will be made out of the Cash Allowances for this project.

END OF SECTION

SECTION 02 65 00.13

UNDERGROUND STORAGE TANK SYSTEMS (USTS) REMOVAL

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide removal and disposal of the underground storage tank systems (USTs) and piping, and removal and disposal of the residual fluids/sludges remaining in the USTs, and if necessary, removal and disposal of any contaminated soil, as shown on the Drawings, as specified herein, as directed by the Engineer, and as needed for a complete and proper removal.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.2 SUBMITTALS

- A. Submit documentation regarding original status of tank as specified prior to removal.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
 - 1. Provide written proof of compliance with Office of the State Fire Marshal (OSFM) contractor registration requirements.
 - 2. Provide written proof of compliance with applicable OSHA Hazardous Waste Site requirements for all personnel involved with removal and disposal.
- B. Obtain Underground Storage Tank (UST) removal permits from the OSFM.
 - 1. Pay for all necessary fees.

1.4 DESCRIPTION OF WORK

- A. Remove and dispose of the following:
 - 1. USTs complete including all related piping and other miscellaneous items.

1.5 EXISTING TANK INFORMATION

- A. Existing tank information for reference:
 - 1. <http://webapps.sfm.illinois.gov/ustsearch/Facility.aspx?ID=2002990>
 - a. Facility Number: 2002990.
 - b. Facility Name: City of Wheaton.
 - c. Address: 1590 S President St, Wheaton, IL 60187.
 - d. County: Du Page.
 - e. Status: Active.
 - f. Facility Type: City/Town.
 - g. Owner Type: Municipal.
 - h. Green Tag Decal: Q004402.
 - i. Green Tag Issue Date: 1/14/2015.
 - j. Green Tag Expiration Date: 12/31/2017.
 - k. Owner Number: U0016303.
 - l. Owner Name: City of Wheaton.
 - m. Owner Status: Current Owner.
 - n. No Active Permits Found.
 - o. No Deficiencies Found.
 - p. No IEMA Numbers Found.
 - q. LUST Fund Eligibility and Deductibility Determinations.
 - r. No Applications Found.
 - 2. Tank Information:
 - a. Tank Number: 1.
 - b. Capacity: 2,000.
 - c. Product: Diesel Fuel.
 - d. Status: Currently in use.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide materials, not specifically described but required for proper completion of the work of this Section, as approved by the Owner.
- B. Provide bright color snow fence and berm materials as necessary for the construction of barricades.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL SPECIALIST

- A. Provide the services of an Environment Specialist on site to monitor/sample and conduct a BETX/PNA or VOC testing/sampling and provide a 20-45 Day Corrective Action Completion Report (CACR).

3.2 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed.
 - 1. Correct conditions detrimental to timely and proper completion of the Work.
 - 2. Do not proceed until unsatisfactory conditions are corrected.

3.3 PROTECTION

- A. Protect existing utilities indicated or made known.
- B. Protection of persons and property:
 - 1. At the direction of the Owner, or at the end of each phase of work, barricade open depressions and holes with snow fence that occur as part of this Work.
 - 2. Locate snow fence approximately 5 to 10 feet from the edge of the excavation around the perimeter.
 - 3. Construct a soil berm, approximately 6 inches tall by 12 inches wide, between the excavation and the barricade.
 - 4. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this Section.
- C. Use appropriate means to prevent dust becoming a nuisance to the public, to the neighbors, and to other work being performed on or near the site.
- D. Maintain access to the site at all times.

3.4 SURFACE CONDITIONS, PROTECTION, DEMOLITION, AND CONSERVATION OF SOIL

- A. Preparation:
 - 1. Determine the depth and volume of any fluids in each tank prior to removal of same.
 - 2. Provide information to Engineer prior to removal.
- B. Excavation and removal:
 - 1. Schedule with the OSFM for their representative to be on-site prior to start and during the removal of each USTs from the ground.
 - 2. Empty and clean UST until vapor-free prior to removal in accordance with the OSFM's guidelines.
 - 3. At the end of the removal of the USTs, collect soil samples from the bottom and side walls of the excavated area and along the piping trench as directed by the Engineer.
 - 4. If necessary, excavate any contaminated soils, remove and stockpile on plastic sheeting as directed by the Engineer.
 - 5. Backfill excavation as specified under Section 31 23 39.

3.5 DISPOSAL

- A. Clean the USTs on-site and deliver to a recycler as scrap material.
 - 1. Cleaning:
 - a. Clean the USTs in accordance with OSFM guidelines.
 - b. Dispose of washwater and rinsewater in accordance with all applicable regulations.
 - 2. Cut a hole in tank wall, removing at least 5 percent of the wall area after cleaning and prior to removal from site.
- B. Dispose of remaining fuels and residuals in the USTs, waste and contaminated soils (if necessary) at landfills and reclaimers permitted by the IEPA to accept such wastes and in accordance with applicable laws and regulations.
 - 1. Manifest and transport all contaminated soils (if necessary) and/or residual tank fluids/sludges by a licensed waste hauler.
 - 2. Provide Owner with proper copies of all IEPA Disposal Manifests.
 - 3. Provide Owner with proper receipts from recycler for all reclaimed materials.
- C. Obtain any permits and conduct any supplemental testing required by the landfill or reclaimer/treatment facility accepting materials generated as a result of this work.
- D. Disposal of contaminated soils (if necessary) shall be paid on a unit price basis as provided in the Supplemental Unit Prices included in the Proposal.

3.6 RESTORATION

- A. General:
 - 1. When directed by the Engineer or Owner, restore the site.
 - 2. Use satisfactory uncontaminated excavated backfill or structural backfill material.

3.7 UTILITIES

- A. Coordinate UST removal and disposal operations with utility companies and agencies as required.
 - 1. Perform utility cutting, capping, or plugging in accordance with requirements of the utility company or governmental agency having jurisdiction.

3.8 OTHER WORK

- A. Coordinate UST removal and disposal operations with other contractors engaged in work at the sites.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide cast-in-place concrete, including formwork and reinforcement, as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Prior to placing concrete on the project, submit the following to the Engineer for approval:
 - a. Testing laboratory reports for each proposed concrete mix, design proportions and sieve analysis, and soundness tests for fine and coarse aggregates.
 - b. Test results for strength, slump, and entrained air content in accordance with the latest requirements of ASTM-C39 and ASTM-C192 on trial mix or field-testing records completed within previous 24 months. Perform strength tests on two test cylinders after 7 days curing and on two cylinders after 28 days curing.
 - c. Evidence of compliance with ASTM specifications for materials proposed to be used in the concrete mix.
 - d. Detailed reinforcing bar fabrication drawings prepared in accordance with ACI 315 including location of bar splices proposed by the Contractor in addition to those shown on the Drawings.
 - 2. Submit manufacturer's data to prove compliance with the specifications for the following products:
 - a. Non-shrink grout.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

CAST-IN-PLACE CONCRETE

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- E. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with "Specifications for Structural Concrete for Buildings," ACI 301, except as may be modified herein.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
- B. Provide proper storage for reinforcing steel at the project site, including protective covering and blocking to keep steel off the ground.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 FORMS

- A. Use smooth, clean plywood or metal lined panels in good condition for forming exposed concrete surfaces including interior and exterior walls, beams, columns, and slabs. Coat the forms with a non-staining, non-reactive mineral oil.
- B. When reusing lumber for formwork, remove nails, thoroughly clean, and fill and finish holes to produce smooth concrete surfaces free of defects.
- C. Form Ties: Factory-fabricated steel snap-off or coil tie assemblies designed to resist the lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 1. Furnish tie assemblies that will leave no metal or other material except concrete within 1½ inches of the formed surface when forms, inserts and tie ends are removed.
 2. Furnish tie assemblies that provide cone-shaped depressions in the forms at the surface, at least 1-inch in diameter and 1½ inches deep, to allow filling and patching.
 3. Provide ties with integral steel or neoprene waterstop at midpoint for liquid containment structures, sludge storage structures, spill containment areas and below grade structures with accessible spaces.
 4. Do not use common wire for form ties.

2.2 REINFORCEMENT

- A. Comply with the following:
 - 1. Bars: Deformed billet steel conforming to ASTM A615, grade 60, unless otherwise shown on the Drawings.
 - 2. Tie wire: 16 gauge annealed steel wire.
- B. Fabricate reinforcement in accordance with the latest provisions of ACI 318 "Building Code Requirements for Structural Concrete".
- C. Shop fabricate bars by cold bending to the dimensions and shapes shown on the detail shop drawings unless otherwise shown on the Drawings or approved by the Engineer.
- D. Use bars that are free from paint, oil, dirt, scale, or excessive rust which will destroy or reduce the bond when embedded in concrete.

2.3 CONCRETE MATERIALS

- A. Comply with the following:
 - 1. Portland cement: ASTM C150, Type I.
 - 2. Aggregate, general:
 - a. ASTM C33, uniformly graded and clean;
 - b. 35 to 50 percent ratio of fine aggregate to total aggregate by weight of surface dry materials.
 - 3. Aggregate, coarse: Pass a 1.500-inch sieve.
 - 4. Aggregate, fine: Pass a 0.375-inch sieve.
 - 5. Water: Fresh, clean, and free of oils, acids, alkalies, organic matter and deleterious substances.
- B. Provide concrete with the following properties:
 - 1. Minimum 28-day compressive strength: 4000 psi.
 - 2. Maximum water-cement ratio: 0.45 by weight.
 - 3. Minimum cement content: 520 pounds per cubic yard.
 - 4. Minimum slump: 1-inch.
 - 5. Maximum slump: 4 inches.
- C. Use air-entrained concrete except where a smooth steel trowel finish is required. Provide a total air content of 4 to 6 percent by volume.

2.4 GROUT

- A. Non-shrink grout:
 - 1. Furnish pre-mixed, non-metallic, non-staining, non-corrosive, non-gas liberating, cement-based grout specifically recommended by the manufacturer for interior and exterior applications and complying with U.S. Corps of Engineers' Specification CRD C-621 and ASTM C 1107.
 - 2. Acceptable products:
 - a. Multipurpose Grout, Dayton Superior Corporation.

- b. Or equal.

2.5 CONCRETE ADMIXTURES

- A. Air-entraining admixtures:
 - 1. Conform to the latest requirements of ASTM C260.
- B. Water reducing admixtures:
 - 1. Conform to the latest requirements of ASTM C494.
 - 2. Type A (normal setting type) for all concrete.
 - 3. Type D (retarding setting type) or Type E (accelerating setting type) when approved by the Engineer.
- C. Fly ash admixtures (when approved by the Engineer):
 - 1. Maximum sulfur trioxide content: 5 percent.
 - 2. Maximum loss of ignition: 5 percent.
- D. Do not add calcium chloride, salts, or chemical antifreeze compounds to concrete.

2.6 OTHER MATERIALS

- A. Cement mortar: One part Portland Cement, 2½ parts fine aggregate, and sufficient water to obtain a maximum slump of 6 inches.
- B. Bonding grout: One part cement, one part fine aggregate, and sufficient water to obtain the consistency of thick cream.
- C. Patching mortar: One part cement, 2½ parts fine aggregate, and sufficient water to obtain a maximum slump of 1-inch.
- D. Dissipating curing compound: Water based, hydrocarbon resin liquid membrane-forming dissipating curing compound complying with ASTM C309, Type 1, Class B.
 - 1. Maximum VOC content: 100 g/L.
 - 2. Acceptable products:
 - a. W. R. Meadows, 1100-CLEAR.
 - b. Or equal.
- E. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FORMS

- A. Design, erect, support, brace, and maintain formwork to safely support vertical and lateral loads until such loads can be supported safely by the concrete structure.
- B. Assemble forms with tight flush joints securely clamped to prevent leakage of mortar. Brace forms to safely support concrete without deformation under load.
- C. Construct forms within the tolerance limits of permissible variations from lines, grades, and dimensions shown on the Drawings, in accordance with ACI 347 "Recommended Practice for Concrete Formwork".
- D. Construct forms to the exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.
- E. Notify the Engineer when formwork is complete so that a proper check may be made at least 24 hours prior to concrete placement.
- F. Carefully remove forms, ensuring complete protection of the structure.
- G. Remove forms for vertical sides of walls, beams, girders, columns, and other similar structural members 24 hours minimum after placement of concrete, provided the concrete has hardened sufficiently and will not be damaged.
- H. Do not remove forms and bracing for slabs, beams, girders, and similar structural members until the concrete structural members have attained sufficient strength to safely support their own weight and any construction or storage load.

3.3 REINFORCING

- A. Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.
 - 1. Clean reinforcement and remove loose dust and mill scale, earth, and other materials that reduce bond or destroy bond with concrete.
 - 2. Accurately place and secure reinforcing steel within the tolerances required by ACI 318 using tie bars, chairs, bolsters, wire, clips or other devices approved by the Engineer.
 - 3. Provide plastic protected bar supports for slab reinforcing.
 - 4. Place bar supports for grade beams and slabs on bearing plates or blocks to prevent displacement into the earth subgrade.
 - 5. Place reinforcement to obtain the following clear coverages for concrete protection, within tolerance limits specified in ACI 318 "Building Code Requirements for Structural Concrete":
 - a. Footings and slab surfaces on earth: 3 inches.
 - b. Walls and beams, column and slab surfaces exposed to weather or earth, or submerged: 2 inches.
 - c. Provide the following minimum clear distances between parallel reinforcing bars, between adjacent contact splices, and between a

contact splice and an adjacent bar: 1-inch, one bar diameter, or 1-1/3 times the maximum size of coarse aggregate, whichever is larger.

6. Reinforcing bar splices:
 - a. 40 bar diameters in length, unless otherwise shown on the Drawings.
 - b. Staggered in adjacent bars where practical.
 - c. Securely tied.
 - d. Welded only where shown on the Drawings, conforming to the requirements of AWS D12.1.

3.4 EMBEDDED ITEMS

- A. Provide for the proper placement and support of fittings, inserts, fixtures, and sleeves to be built into the concrete work under other sections of the Specifications.
- B. Shop paint non-ferrous metal surfaces of embedded items as described in Section 05 50 00 of these Specifications.

3.5 MIXING CONCRETE

- A. Project site batched-mixed concrete:
 1. Mix in accordance with ACI 318, Chapter 5.8.1 and 5.8.3.
- B. Ready-mixed concrete:
 1. Pre-mix and transport to project site in accordance with ASTM C94.
 2. Record time of departure from the mixing plant and batch weights of cement and water on the delivery tickets.
 3. Water may be added to the ready-mixed concrete once after delivery, only if the maximum water cement ratio and slump will not be exceeded.
 4. Reject concrete not in place within 60 minutes after introducing water to the mix when transported in agitator trucks or within 30 minutes after introducing water to the mix when transported in nonagitator trucks.

3.6 PLACING CONCRETE

- A. Preparation:
 1. Remove hardened concrete and foreign material from conveying equipment.
 2. Remove foreign matter and excess water accumulated in forms.
 3. Rigidly close temporary openings left in formwork.
 4. Thoroughly sprinkle earth subgrades for structural slabs without vapor barrier protection to eliminate moisture absorption.
 5. Before depositing new concrete on or against concrete which has hardened:
 - a. Thoroughly clean hardened concrete and saturate with water.
 - b. Thoroughly cover hardened concrete surface with a 1/8-inch thick coating of neat cement mortar and place new concrete before the mortar has attained its initial set.
 6. Use only clean tools.

- B. Conveying:
 1. Convey concrete from the mixer to place of final deposit as rapidly as practical by methods which will prevent separation or loss of ingredients and assure the required quality of concrete.
 2. Deposit concrete as nearly as practicable to its final location to avoid separation due to rehandling and flowing.
 3. Do not allow free fall of concrete to exceed 5 feet.
 4. Do not use concrete which becomes non-plastic and unworkable, or does not meet required quality control limits, or has been contaminated by foreign materials.
 5. Remove rejected concrete from job site.
- C. Placing concrete in forms:
 1. Deposit concrete continuously or in layers so that no concrete will be placed on concrete which has hardened sufficiently to cause cold joints in the work.
 2. If necessary, add construction joints, approved by the Engineer.
 3. Remove temporary spreaders, screeds, etc. as they become unnecessary.
- D. Placing concrete slabs:
 1. Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until placing of a panel or section is completed.
 2. Bring slab surfaces to correct level with a straightedge, and then strike off.
 3. Use bullfloats or darbies to smooth the surface, leaving it free of bumps and hollows.
 4. Do not sprinkle water on plastic surface. Do not disturb slab surface prior to start of finishing operations.

3.7 CONSOLIDATION

- A. General:
 1. Consolidate each layer of concrete immediately after placing, by use of mechanical vibrators supplemented by hand spading, rodding, or tamping so that the concrete is thoroughly worked around reinforcement, embedded items, and into corners of the forms, eliminating all air or stone pockets which may cause honeycomb, pitting, or planes of weakness.
 2. Use mechanical vibrators with a minimum frequency of 7,000 revolutions per minute.
 3. Insert vibrator at points approximately 18 inches apart for approximately 5 to 15 seconds at each point, sufficient to consolidate concrete, but not to cause segregation.
 4. Do not overvibrate or use vibrators to transport concrete inside forms.
 5. Provide a spare vibrator and auxiliary power source at the site during placement operations.

3.8 JOINTS

- A. Construction joints:
 1. Do not relocate construction joints shown on the Drawings or add construction joints, unless approved by the Engineer.

2. Form construction joints perpendicular to main reinforcement and near quarter points of slabs, beams, and girders.
3. Continue reinforcing steel across construction joints as shown on the Drawings or as required by the Engineer.
4. Form keyways in construction joints a minimum of 1½ inches deep and 3½ inches wide unless otherwise shown on the Drawings.

3.9 CONCRETE FINISHING

- A. Finish concrete work to smooth, clean surfaces of uniform color with no roughness or imperfections.
- B. Remove roughness, projections, honeycomb, and other defects in formed concrete surfaces to sound concrete.
- C. Patch depressions and tie holes immediately after form removal.
 1. Thoroughly wet areas to be patched to prevent absorption of water from patching mortar.
 2. Thoroughly brush bonding grout on areas to be patched.
 3. Consolidate patching mortar into place and strike off to leave a patch slightly higher than surrounding concrete surface to allow for initial shrinkage.
 4. Leave patch area undisturbed for at least one hour before final finishing.
 5. Prepared proprietary compounds for bonding grout and patching mortar may be used in lieu of or in addition to the above patching procedure, if approved by the Engineer.
- D. Unless otherwise shown on the Drawings, provide the following finishes at the indicated locations:
 1. Float finish:
 - a. Monolithic slab surfaces that are to receive trowel finish and other slab finishes specified herein.
 2. Trowel finish:
 - a. Monolithic slab surfaces that are to be exposed to view, unless otherwise shown.
 3. Non-slip broom finish:
 - a. Walks, stairs, drives, ramps, and similar pedestrian and vehicular areas.
 - b. Apply by dragging coarse bristle broom or burlap belt across concrete with uniform parallel overlapping strokes.
 4. As-formed finish:
 - a. Surfaces adjacent to earth and more than 12 inches below finished grade level.
 - b. Other surfaces not exposed to view.
 5. Smooth rubbed grout finish:
 - a. Exposed concrete surfaces including walls, beams, columns, and other vertical and inclined surfaces.
 - b. Surfaces adjacent to earth, stone, sand, or other special media to a depth of 12 inches below the required material grade line or low water level.

- c. Apply finish to freshly hardened concrete as soon as possible after removal of forms.
- d. Apply grout slurry, consisting of one part cement to 1½ parts fine aggregate mixed with water, uniformly over a predampened surface with clean burlap pads or with sponge-rubber or cork floats.
- e. Rub grout surface with carborundum stone or similar abrasive to produce a uniform color and texture.
- f. Remove excess grout with a dry burlap pad or a brush.

3.10 CONCRETE CURING

- A. Protect fresh concrete and grout surfaces from premature drying and excessively hot or cold temperatures.
- B. Cure fresh concrete and grout surfaces in a moist condition at a relatively constant temperature for at least 7 days after placement of Type I Portland Cement concrete, or longer if necessary for hydration and proper hardening of the concrete.
- C. Perform curing by one of the following methods:
 - 1. Ponding or continuous water spraying on concrete surface.
 - 2. Covering concrete surfaces with continuously wetted burlap, cotton, or other absorptive mats or fabric.
 - 3. Covering concrete surfaces with impervious waterproof paper or polyethylene film having 4-inch tape-sealed laps at common edges and taped-sealed and weighted perimeter.
 - 4. Applying curing compound on concrete surfaces to which additional concrete will not be bonded in accordance with manufacturer's instructions:
- D. Maintain temperature of fresh concrete between 50 degrees and 70 degrees F for the required curing period.
- E. Provide and erect necessary facilities for heating, covering, insulating, or housing the concrete work for cold weather protection.

3.11 CUTTING AND PATCHING OF EXISTING CONCRETE

- A. Provide neat and smooth finished exposed surfaces.
- B. Provide one inch deep (minimum) saw cuts.
- C. Cut off exposed reinforcing bars a minimum of one inch back of finished surface and fill remaining cavity with patching mortar.
- D. Provide straight and square lines at finished openings and 3/4-inch chamfers at exposed corners.
- E. Core drill openings for new pipes and conduits and patch with non-shrink grout.
- F. Grind exposed finished surfaces flush to meet and match existing surfaces.

3.12 REMEDIAL WORK

- A. Repair or replace deficient work as directed by the Engineer and at no additional cost to the Owner.

END OF SECTION

CAST-IN-PLACE CONCRETE
03 30 00-10 (160194.40)

SECTION 05 50 00
METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide miscellaneous metal work as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.2 SUBMITTALS

- A. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE

- A. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.
 - 1. Structural Welding Code Steel: D1.1.
 - 2. Structural Welding Code Aluminum: D1.2.
 - 3. Structural Welding Code Sheet Steel: D1.3.
 - 4. Structural Welding Code Stainless Steel: D1.6.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, rolled trade names, and roughness.
- B. Comply with pertinent provisions of the following standards, latest edition.
 - 1. Aluminum castings: ASTM B26.
 - 2. Aluminum sheet and plate: ASTM B209, Alloy 6061-T6.
 - 3. Aluminum drawn seamless tubes: ASTM B210, Alloy 6063-T5.
 - 4. Aluminum extrusions: ASTM B221, Alloy 6063-T6.

5. Aluminum seamless pipe: ASTM B241, Alloy 6061-T6.
6. Aluminum forgings: ASTM B247, Alloy 6061-T6.
7. Aluminum structural shapes: ASTM B308, Alloy 6061-T6.
8. Aluminum structural pipe and tube: ASTM B429, 6061-T6.
9. Aluminum tread plate: ASTM B632, Alloy 6061-T6.
10. Steel plates, shapes, and bars: ASTM A36.
11. Steel plates to be bent or cold-formed: ASTM A283, Grade C.
12. Steel tubing (hot-formed, welded, or seamless): ASTM A501, Grade B.
13. Steel bars and bar-size shapes: ASTM A663, Grade 65, or ASTM A36.
14. Cold-finished steel bars: ASTM A108.
15. Cold-rolled carbon steel sheets: ASTM A1008.
16. Galvanized carbon steel sheets: ASTM A653, with G90 zinc coating.
17. Stainless steel bars, angles and shapes: ASTM A276, Type 316 (Type 316L for welded connections).
18. Welded stainless steel mechanical tubing: ASTM A554, Type 316 (Type 316L for welded connections).
19. Stainless steel fasteners: ASTM F593 and F594, Type 316.
20. Stainless steel wire fabric, sheet and plates: ASTM A240, Type 316 (Type 316L for welded connections).
21. Gray iron castings: ASTM A48.
22. Malleable iron castings: ASTM A47.
23. Steel pipe: ASTM A53, Grade A, Schedule 40, black finish unless otherwise noted.
24. Concrete inserts: Threaded or wedge type galvanized ferrous castings of malleable iron complying with ASTM A27.

2.2 ANCHORS AND FASTENERS

- A. Provide Type 316 stainless steel anchor bolts, threaded rods, bolts, nuts, screws, staples, washers, rivets, lock nuts, nails, pins, hooks, clamps, and all other metal fasteners.
- B. Post installed mechanical anchors:
 1. Provide Type 316 stainless steel wedge, sleeve and drop-in expansion anchors of size and number required for the particular use.
 2. Furnish anchors suitable for installation in cracked and uncracked base materials to resist short and long-term sustained loading.
 3. Acceptable manufacturers:
 - a. Simpson Strong-Tie Company, Inc.
 - b. Hilti, Inc.
 - c. ITW Redhead.
 - d. Or equal.
- C. Post installed adhesive anchors:
 1. Provide Type 316 stainless steel threaded rods set in place with a cartridge type, two-component, high solids epoxy adhesive system dispensed and mixed through a static mixing nozzle supplied by the manufacturer.

2. Concrete base material: Furnish material suitable for anchorage of threaded rods in cracked and uncracked concrete to resist long-term sustained loading, tested and qualified in accordance with the International Code Council Acceptance Criteria for Post-installed Adhesive Anchors in Concrete Elements (AC308).

- a. Acceptable products:
 - (1) Hilti Inc., HIT-RE 500-SD.
 - (2) Simpson Strong-Tie, SET-XP.
 - (3) No substitution permitted.

- D. Provide Type 304 stainless steel screw anchors of size and number required for the particular use.

1. Acceptable products:
 - a. Powers Fasteners, Tapper Screw Anchor.
 - b. Or equal.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

2.4 FABRICATION

- A. Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.
- B. Fabricate with accurate angles and surfaces which are true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.
- C. Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the item.
- D. On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish it from the first.

PART 3 - EXECUTION

3.1 SHOP TREATMENT OF METAL SURFACES

- A. Clean ferrous metal surfaces, except stainless steel and work to be galvanized, by sandblasting to bare metal in accordance with the Steel Structures Painting Council Specifications (SSPC) SP-10 and shop prime as specified under the Section 09 90 00.
 1. Do not shop prime or paint contact surfaces which are to be field bolted or welded.

- B. Clean cast iron surfaces by sandblasting to bare metal in accordance with SSPC SP-6 and shop paint with a two-coat system of bituminous paint using Tnemec 46-465 Heavy Duty Black, or equal.
- C. Clean stainless steel surfaces to remove oil, grease, hand and finger prints, and any other surface contaminants after fabrication and passivate in a 20 percent nitric acid solution.
 - 1. Protect polished stainless steel surfaces with removable plastic coatings or coverings during delivery, handling, and installation.
- D. Provide standard mill finish for aluminum surfaces unless clear anodized or color finish is otherwise specified.
 - 1. Provide caustic etch and anodic oxide treatment for aluminum surfaces to be anodized, conforming to the Aluminum Association Standard AA-M12C22A.
- E. Properly clean copper and bronze metal surfaces and shop coat with a high quality clear finishing lacquer.
- F. Shop paint non-ferrous metal surfaces which will contact dissimilar metals, mortar, concrete, plaster, or any other corrosive material with one heavy coat of bituminous paint, using Tnemec 46-465, or equal.

3.2 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.3 INSTALLATION

- A. General:
 - 1. Set work accurately into position, plumb, level, true, and free from rack.
 - 2. Anchor firmly into position.
 - 3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.
 - 4. Grind exposed welds smooth and touch-up shop prime coats.
 - 5. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.
 - 6. Immediately after erection, clean the field welds, bolted connections, and abraded areas of shop priming. Paint the exposed areas with same material used for shop priming.
- B. Post installed anchors:
 - 1. Perform anchor installation in accordance with manufacturer's instructions.

2. Identify location of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not cut or damage reinforcing steel, prestressed steel tendons, piping, conduits or other embedded items. Notify the Engineer of reinforcing steel or other embedded items encountered during drilling.
3. Use drill type, bit type and diameter recommended by the anchor manufacturer.
4. Drill holes perpendicular to surface of concrete or masonry after concrete, mortar or grout has achieved full design strength.
5. Clean holes to remove loose material and drilling dust prior to installation of anchors.
6. Mechanical anchors:
 - a. Protect threads from damage during anchor installation.
 - b. Use a torque wrench to set anchors to manufacturer's recommended torque.
7. Adhesive anchors:
 - a. Install screen tubes for anchorage of threaded rods in hollow masonry base materials.
 - b. Follow manufacturer's recommendations to ensure proper mixing of adhesive components.
 - c. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 - d. Inject sufficient adhesive in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer's specified cure time has elapsed.
 - e. Observe manufacturer's recommendations with respect to installation temperatures.
8. Provide the following minimum embedment, edge distance and spacing unless indicated otherwise by the anchor manufacturer's instructions or shown otherwise on the Drawings:

Anchor Type	Min Embedment (Bolt Diameters)	Min Edge Distance (Bolt Diameters)	Min Spacing (Bolt Diameters)
Wedge	9	6	10
Sleeve	4	6	12
Drop-In	4	6	12
Adhesive	9	9	14

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wood, nails, bolts, screws, framing anchors, miscellaneous hardware and other items needed to perform carpentry for construction shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with the pertinent codes and regulations of governmental agencies having jurisdiction.
- C. Comply with pertinent provisions of the following codes and standards:
 - 1. American Wood Council (AWC): National Design Specifications for Wood Construction, ANSI/AF&PA NDS-latest edition.
 - 2. National Institute of Standards and Technology:
 - a. American Softwood Lumber Standard, PS 20-latest edition.
 - b. Standard for Construction and Industrial Plywood, PS 1-latest edition.
 - 3. American Lumber Standards Committee (ALSC): National Grading Rule.
 - 4. American Plywood Association (APA): Grades and Specifications.

5. American Wood Preservers Association (AWPA):
 - a. Lumber, Timber, Bridge Ties and Mine Ties -- Pressure Treatment, AWPA C2-latest edition.
 - b. Plywood Pressure Treatment, AWPA C9-latest edition.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
- B. Deliver the materials to the job site and store, in a safe area, out of the way of traffic, and shored up off the ground surface.
- C. Identify framing lumber as to grades, and store each grade separately from other grades.
- D. Use extreme care in off loading of lumber to prevent damage, splitting and breaking of materials.
- E. Protect metals with adequate waterproof outer wrapping.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE– Reserved.

PART 2 - PRODUCTS

2.1 GRADE STAMPS

- A. Identify framing lumber by the grade stamp of the National Lumber Grades Authority (NLGA), or such other grade stamp as is approved in advance by the Engineer.
- B. Identify plywood as to species, grade, and glue type by the stamp of the American Plywood Association (APA).
- C. Identify other materials of this Section by the appropriate stamp of the agency approved in advance by the Engineer.

2.2 MATERIALS

- A. Provide materials in the quantities needed for the Work shown on the Drawings, and meeting or exceeding the following standards of quality:
 1. Framing lumber for studs, plates, rafters, beams, and joists: Douglas Fir-Larch or Spruce-Pine-Fir, Grade No. 2 or better.
 2. Plywood: APA EXT Grade C-D or better.
 3. Finish lumber for trim: Grade C Select White Pine, thoroughly seasoned or kiln dried, and uniform in color.
 4. Rough hardware:
 - a. Steel items: Comply with ASTM A36.

- b. Bolts: Comply with ASTM A307.
- c. Lag screws: Comply with ASTM A307.
- d. Nails: Use common except as otherwise noted.
- e. Connectors: Simpson, Teco, or equal as approved by the Engineer.
- f. Provide ASTM A653, G185 hot dip galvanized coating for rough hardware at exposed exterior locations or at locations in contact with treated wood.
 - (1) Steel items, bolts, lag screws and nails: Comply with ASTM A153.
 - (2) Connectors: Comply with ASTM A123.

B. Treated wood:

- 1. Provide pressure treated lumber and plywood where shown on the Drawings.
- 2. Pressure treat above ground wood members in contact with concrete or masonry with waterborne alkaline copper quaternary (ACQ) preservative system containing no arsenic and no chromium to a minimum retention of 0.25 lb./cu.ft.
- 3. Pressure treat wood members in contact with ground or fresh water with waterborne alkaline copper quaternary (ACQ) preservative system containing no arsenic and no chromium to a minimum retention of 0.45 lb./cu.ft.
- 4. Kiln dry all wood to a 19 percent maximum moisture content before and after pressure treatment.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 DELIVERIES

- A. Stockpile materials sufficiently in advance of need to assure their availability in a timely manner for this Work.
- B. Make as many trips to the job site as are needed to deliver materials of this Section in a timely manner to ensure orderly progress of the Work.

3.3 COMPLIANCE

- A. Do not permit materials not complying with the provisions of this Section to be brought onto or to be stored at the job site.

- B. Promptly remove non-complying materials from the job site and replace with materials meeting the requirements of this Section.

3.4 WORKMANSHIP

- A. Produce joints which are tight, true, and well nailed, with members assembled in accordance with the Drawings and with pertinent codes and regulations.
- B. Finish trim jointing:
 - 1. Make joints to conceal shrinkage; miter exterior joints; cope interior joints; miter or scarf end-to-end joints.
 - 2. Install trim in pieces as long as possible, jointing only where solid support is obtained.
- C. Selection of lumber pieces:
 - 1. Carefully select the members.
 - 2. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing, and will allow making of proper connections.
 - 3. Cut out and discard defects which render a piece unable to serve its intended function.
 - 4. Lumber may be rejected by the Engineer, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
- D. Do not shim any framing component.

3.5 GENERAL FRAMING

- A. General:
 - 1. In addition to framing operations normal to the fabrication and erection indicated on the Drawings, install wood blocking and backing required for the work of other trades.
 - 2. Set horizontal and sloped members with crown up.
 - 3. Do not notch, cut, or bore members for pipes, ducts, or conduits, or for other reasons except as shown on the Drawings or as specifically approved in advance by the Engineer.
- B. Bearings:
 - 1. Make bearings full unless otherwise indicated on the Drawings.
 - 2. Finish bearing surfaces on which structural members are to rest so as to give sure and even support.
 - 3. Where framing members slope, cut or notch the ends as required to give uniform bearing surface.

3.6 BLOCKING AND BRIDGING

- A. Install blocking as required to support items of finish and to cut off concealed draft openings, both vertical and horizontal, between ceiling and floor areas.

- B. Bridging:
 1. Install wood cross bridging (not less than 2" x 3" nominal), metal cross bridging of equal strength, or solid blocking between joists where the span exceeds 8' - 0".
 2. Provide maximum distance of 8' - 0" between a line of bridging and a bearing.
 3. Cross bridging may be omitted for roof and ceiling joists where the omission is permitted by code, except where otherwise indicated on the Drawings.
 4. Install solid blocking between joists at points of support and wherever sheathing is discontinuous. Blocking may be omitted where joists are supported on metal hangers.

3.7 ALIGNMENT

- A. On framing members to receive a finished surface, align the finish subsurface to vary not more than 1/8-inch from the plane of surfaces of adjacent furring and framing members.

3.8 INSTALLATION OF PLYWOOD SHEATHING

- A. Placement:
 1. Place plywood with face grain perpendicular to supports and continuously over at least two supports, except where otherwise shown on the Drawings.
 2. Center joints accurately over supports, unless otherwise shown on the Drawings.
- B. Protect plywood from moisture by use of waterproof coverings until the plywood in turn has been covered with the next succeeding component or finish.

3.9 FASTENING OF FRAMING LUMBER

- A. Nailing:
 1. Provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike, provided, however, that 16d nails may be used to connect two pieces of 2-inch (nominal) thickness.
 2. Nail without splitting wood.
 3. Prebore as required.
 4. Remove split members and replace with members complying with the specified requirements.
- B. Bolting:
 1. Drill holes 1/16-inch larger in diameter than the bolts being used.
 2. Drill straight and true from one side only.
 3. Do not bear bolt heads on wood, but use washers under head and nut where both bear on wood, and use washers under all nuts.
- C. Screws:
 1. For lag screws and wood screws, prebore holes same diameter as root of threads, enlarging holes to shank diameter for length of shank.

3.10 FASTENING OF TRIM

- A. Install items straight, true, level, plumb, and firmly anchored in place.
- B. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of required backing and blocking in a timely manner.
- C. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.
- D. Nail exterior trim with galvanized nails, making joints to exclude water and setting in waterproof glue or the sealant.
- E. On exposed work, set nails for putty.
- F. Screw, do not drive, wood screws; except that screws may be started by driving and then screwed home.

3.11 FINISHING

- A. Sandpaper finished wood surfaces thoroughly as required to produce a uniformly smooth surface, always sanding in the direction of the grain; except do not sand wood which is designed to be left rough.
- B. No coarse grained sandpaper mark, hammer mark, or other imperfection will be accepted.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide building insulation as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 MASONRY INSULATION

- A. Cavity wall:
 - 1. Provide rigid glass reinforced polyisocyanurate insulation boards with aluminum foil facing on both sides.
 - 2. Thickness: 1½-inch, unless otherwise shown on the Drawings.

3. R-Value: 9.8 ft²-h-°F/Btu minimum at 75° F (mean temperature stabilized R-Value, per ASTM C518).
 4. Water absorption: No greater than 1.0% by volume per ASTM C209.
 5. Water Vapor Performance: No greater than 1.0 perm (for foam core only per ASTM E96).
 6. Acceptable product:
 - a. Thermax Sheathing, Dow Chemical Company.
 - b. AP Foil Faced, Johns Manville.
 - c. Or equal.
- B. Block core fill:
1. Provide two component foam insulation systems consisting of aminoplast resin and a catalyst foaming agent surfactant.
 2. Acceptable product:
 - a. Core-Fill 500, Tailored Chemical Products, Inc.
 - b. Or equal.

2.2 BATT INSULATION

- A. Provide kraft paper faced batt insulation in accordance with the following:
1. Type A: 3½-inch thick glass fiber batts with an insulation-only value of R-11.
 2. Type B: 6-inch thick glass fiber batts with an insulation-only value of R-19.
 3. Type C: 12-inch thick glass fiber with an insulation-only value of R-38.

2.3 PERIMETER INSULATION

- A. Provide rigid extruded polystyrene foam insulation in block form.
1. Thickness: 2-inch minimum.
 2. Acceptable products:
 - a. Styrofoam SM by Dow Chemical Company.
 - b. Or equal.

2.4 PLASTIC VAPOR BARRIER

- A. Provide polyethylene in sheet form.
1. Thickness: 0.006-inch.
 2. 6-inch overlap at common edges.

2.5 BUILDING WRAP

- A. Building Wrap: ASTM E 1677, Type I air retarded; with flame spread and smoke developed indexes less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and accepted to authorities having jurisdiction.
- B. Building Wrap Tape: Provide tape as recommended by the building wrap manufacturer.
- C. Acceptable manufacturers:
1. DuPont; Tyvek Commercial Wrap.

2. Reemay, Inc.; Typar House Wrap.
3. Or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Building Insulation: Install in strict accordance with the building insulation manufacturer's recommended installation procedures, anchoring all components firmly into place.
- B. Building Wrap:
 1. Install over sheathing in strict accordance with the building wrap manufacturer's recommended installation procedures.
 2. Cover exposed exterior surface of sheathing with building wrap securely fastened to framing immediately after sheathing is installed.
 3. Seal seams, edges, fasteners, and penetrations with tape.
 4. Extend into jambs of openings and seal corners with tape.
 5. Cut back barrier ½-inch on each side of break in supporting members at expansion or control joint locations.
 6. Apply barrier to cover vertical flashing with 4-inch minimum overlap.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included:
 - 1. Furnish finish hardware required to complete the Work as shown on the Drawings and as specified herein.
 - 2. Furnish trim attachments and fastenings, specified or otherwise required, for proper and complete installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.
- D. Americans With Disabilities Act:
 - 1. Furnish finish hardware complying with the requirements of the Americans With Disabilities Act.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Materials list of items proposed to be provided under this Section. Approval of this list by the Engineer will not relieve the Contractor of the responsibility to provide all finish hardware items required for the Work even though such required items may not have been shown on the approved list.
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 3. Manufacturer's recommended installation procedures.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Templates: In a timely manner to assure orderly progress of the Work, deliver templates or physical samples of the approved finish hardware items to pertinent manufacturers of interfacing items such as doors and frames.
- F. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
- B. Individually package each unit of finish hardware, complete with proper fastenings and appurtenances, clearly marked on the outside to indicate contents and specific locations in the Work.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 FASTENERS

- A. Furnish necessary screws, bolts, and other fasteners of suitable size and type to anchor the hardware in position.
- B. Where necessary, furnish fasteners with toggle bolts, expansion shields, hex bolts, and other anchors approved by the Engineer according to the recommendations of the hardware manufacturer.
- C. Provide fasteners which harmonize with the hardware as to finish and material.

2.2 HINGES

- A. Provide three 4½-inch x 4½-inch full mortise template type heavy-weight stainless steel hinges for each swing door.
 - 1. Acceptable products:
 - a. Hager No. BB1199.
 - b. Stanley No. FBB199.
 - c. Or equal.

2.3 LOCKSETS

- A. Provide heavy duty, cylindrical type locksets with matching lever style and universal jamb strike.
 - 1. Comply with Federal Specification No. FF-H-106C, Government Series 161 and ANSI A156.2 Series 4000 Grade 1 and ANSI A117.1.

- B. Exterior doors:
 - 1. Provide Federal Specification No. 161A, ANSI F109 entrance door lockset.
 - 2. Acceptable products:
 - a. Yale Series No. 5407LN (or equal).
 - b. Corbin/Ruswin Series No. CL 3551 (or equal).
- C. Interior passage doors:
 - 1. Provide Federal Specification No. 161N, ANSI F75 passage door latch set.
 - 2. Acceptable products:
 - a. Yale Series No. 5401LN.
 - b. Corbin/Ruswin Series No. CL 3510.
 - c. Or equal.
- D. Interior office and laboratory doors:
 - 1. Provide Federal Specification No. 161R, ANSI F84 door lock set.
 - 2. Acceptable products:
 - a. Yale Series No. 5408LN.
 - b. Corbin/Ruswin Series No. CL 3555.
 - c. Or equal.
- E. Chlorine or sulfur dioxide equipment and container storage room doors:
 - 1. Provide heavy-duty panic exit hardware with inside cross bar and outside knob with matching strike jamb.
 - 2. For single doors, comply with Federal Specification Series 820.
 - 3. Acceptable products for single doors:
 - a. Yale Series No. 7130 with lever handle design.
 - b. Sargent Series No. 9900 with lever handle design.
 - c. Or equal.
 - 4. For double doors, comply with federal Specification Series 821.
 - 5. Acceptable products for double doors:
 - a. Yale Series No. 7110 with lever handle design.
 - b. Sargent Series No. 9700 with lever handle design.
 - c. Or equal.
- F. Bathroom doors:
 - 1. Provide Federal Specification 161L-ANSI F76, Grade 1 door lockset.
 - 2. Acceptable products:
 - a. Yale Series No. 5402LN.
 - b. Corbin/Ruswin No. CL 3520.
 - c. Or equal.

2.4 KEYING

- A. Provide three keys for each lock.
- B. Key all locks alike and match existing key systems wherever practical, except:
 - 1. Provide private keys for office and laboratory doors.

2.5 CLOSERS

- A. Provide heavy duty hydraulically controlled full rack and pinion type closer for each single swing door and active leaf of each double swing door. Provide closer with 90-140 degree hold-open arm.
- B. Comply with ANSI A156.4, Grade 1.
- C. Acceptable products:
 - 1. Yale Series No.51BF.
 - 2. Corbin Russwin Series No. DC 6000.
 - 3. Or equal.

2.6 ASTRAGAL

- A. For the inactive leaf of double doors, provide an overlapping type astragal with vinyl seal and universal strike adaptor.

2.7 HOLDER

- A. For the inactive leaf of double doors, provide Underwriters approved surface mounted solid bar slide bolts with top universal keeper and bottom recessed keeper.

2.8 WEATHER-STRIPPING

- A. Provide weather-stripping to resist infiltration of air and water at all exterior doors.
- B. Provide weather-stripping to resist infiltration of air and water at interior access doors for the following types of rooms:
 - 1. Chemical feed and storage rooms.
 - 2. Unheated storage rooms.
 - 3. Motor vehicle garages.
 - 4. Motor vehicle loading rooms.
 - 5. Engine-generator rooms.
- C. Provide ½-inch thick by 6-inch wide heavy duty fluted top aluminum saddle type threshold at doors to be weather-stripped.
 - 1. Acceptable product: Pemko No. 172A, or equal.
- D. At head and jambs of door frames, provide continuous heavy duty extruded aluminum interlocking door gasketing with silicone seal insert weather-stripping.
 - 1. Acceptable product: Pemko No. 303AS, or equal.
- E. At bottom of doors, provide a continuous heavy duty extruded aluminum channel with integral drip at the outside face of the door and flexible vinyl insert weather-stripping.
 - 1. Acceptable product: Pemko No. 216AV, or equal.

- F. At top of doors, provide a continuous heavy duty extruded aluminum interlocking weather-stripping unit with integral drip cap at the outside face of the door and built in rubber seal.
 - 1. Acceptable product: Pemko No. 68AR-347A, or equal.

2.9 DOOR STOPS

- A. For interior swing type doors, provide a dome type floor mounted door stop.
 - 1. Comply with Federal Specification Type 1300-A.
 - 2. Acceptable products:
 - a. Ives Series No. FS438.
 - b. Baldwin Series No. 4010.
 - c. Or equal.
- B. For exterior swing type doors, provide a pedestal type floor mounted door stop.
 - 1. Comply with Federal Specification Type 1328-E.
 - 2. Acceptable products:
 - a. Ives Series No. FS444.
 - b. Baldwin Series No. 4510.
 - c. Or equal.

2.10 SURFACE FINISH

- A. Provide standard US-26D chrome plated finish for locksets, closers, door stops, and other similar hardware.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install hardware in accordance with manufacturer's recommendations.

3.2 FINAL ADJUSTMENTS

- A. Check and readjust operating finish hardware items.
- B. Leave work in complete and proper operating condition.
- C. Remove defective work and replace with work complying with the specified requirements.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide glazing and glazing accessories as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. In addition to complying with pertinent codes and regulations of governmental agencies having jurisdiction, comply with pertinent recommendations contained in:
 - 1. Flat Glass Marketing Association:
 - a. "Glazing Sealing Systems Manual".
 - b. "Glazing Manual".

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
- B. During storage and handling of glass, provide cushions at edges to prevent impact damage.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

GLAZING

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PART 2 - PRODUCTS

2.1 GENERAL

- A. Door glass:
 - 1. Provide tempered safety glass for all doors and entrances unless laminated glass or plastic glass are indicated on the Drawings.
 - 2. Comply with ANSI Z97.1.
- B. Window glass:
 - 1. Provide clear DSB sheet glass unless otherwise noted on the Drawings.

2.2 TEMPERED SAFETY GLASS

- A. Provide 1/4-inch clear tempered or heat-strengthened glass.
 - 1. Acceptable products: PPG Herculite, or equal.

2.3 LAMINATED GLASS

- A. Where required, provide clear laminated safety glass as shown on the Drawings, consisting of an inner face and an outer face of float glass laminated under heat and pressure to a clear plastic core.
 - 1. Use 1/4-inch thickness for maximum sizes of 60" x 120".
 - 2. For larger sizes, use 3/8-inch thickness.
 - 3. Acceptable products: PPG Monolithic, or equal.

2.4 PLASTIC GLASS

- A. Where required, provide 1/4-inch clear high impact polycarbonate sheet.
 - 1. Acceptable products:
 - a. Lexan as manufactured by General Electric Plastic Department.
 - b. Tuffak as manufactured by Rohm and Haas Company.
 - c. Or equal.

2.5 SHEET GLASS

- A. Provide 1/4-inch clear, conforming to Federal Specification DD-G-451a.

2.6 PLATE GLASS

- A. Comply with federal Specification DD-G-451, Type I, Class I.

2.7 INSULATING GLASS

- A. Where required, provide two 3/16-inch plate glass sheets separated by a 1/4-inch air space hermetically sealed at the factory.
 - 1. Acceptable products: PPG Twindow, or equal.

2.8 OBSCURE GLASS

- A. Where required, provide 7/32-inch thick patterned glass conforming to Federal Specification DD-G-451c.

2.9 CLEAR WIRE GLASS

- A. Comply with Federal Specification DO-G-345, Type III, Class 1, Kind A, form 1, with pattern M3 wire mesh where shown or required.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Clean glazing channels, stops, and rabbets to receive the glazing materials, making free from obstructions and foreign substances which might impair the work.
 - 1. Remove protective coatings which might fail in adhesion or interfere with bond of sealants.
 - 2. Comply with manufacturers' instructions for final wiping of surfaces immediately prior to application of primer and glazing compounds or tapes.
 - 3. Prime surfaces to receive glazing compounds in accordance with manufacturers' recommendations.

3.2 INSTALLATION

- A. Inspect each piece of glass immediately prior to start of installation.
 - 1. Do not install items which are improperly sized, have damaged edges, or are scratched, abraded, or damaged in any other manner.
 - 2. Do not remove labels from glass until so directed by the Engineer.
 - 3. Install glass so distortion waves, if present, run in the horizontal direction.
- B. Locate setting blocks at sills one quarter of the width of the glass in from each end of the glass, unless otherwise recommended by the glass manufacturer.
 - 1. Use blocks of proper size to support the glass in accordance with the manufacturer's recommendations.
 - 2. Provide spacers for all glass sizes larger than 50 inches in length or width, to separate glass from stops; except where continuous glazing gaskets or felts are provided.
 - a. Locate spacers no more than 24 inches apart, and no closer than 12 inches to a corner.
 - b. Place spacers opposite one another.
 - c. Make bite of spacer on glass 1/4-inch or more.
- C. Set glass in a manner which produces the greatest possible degree of uniformity in appearance.
- D. Do not use two different glazing materials in the same joint system unless the joint use is approved in advance by the Engineer.
- E. Mask, or otherwise protect, surfaces adjacent to installation of sealants.

- F. Miter-cut and seal the joints of glazing gaskets in accordance with the manufacturer's recommendations, to provide watertight and airtight seal at corners and other locations where joints are required.

3.3 PROTECTION

- A. Protect glass from breakage after installation by promptly installing streamers or ribbons, suitably attached to the framing and held free from glass. Do not apply warning markings, streamers, ribbons, or other items directly to the glass except as specifically directed by the Engineer.

END OF SECTION

SECTION 08 91 00

LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide louvers, screens, and associated dampers as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. This Section includes the following:
 - 1. Fixed, extruded-aluminum louvers.
- D. Related Sections:
 - 1. Refer to Section 23 00 00, HEATING, VENTILATING, AND AIR CONDITIONING (HVAC) for ductwork, motorized dampers, and gravity dampers associated with louvers.
- E. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Materials list of items proposed to be provided under this Section.
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
 - 3. Louver performance data, include printed catalog pages or computer selection results showing airflow pressure loss and water penetration based on tests in accordance with AMCA 500 standards.
 - a. For louvers specified to bear AMCA seal, include printed pages showing specified models with appropriate AMCA Certified Ratings Seals.
 - b. Indicate free area of each louver provided.
 - 4. Fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

LOUVERS

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- E. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 FIXED, EXTRUDED ALUMINUM LOUVERS

- A. General: Unless indicated otherwise, provide stationary type fixed aluminum louvers with drainable heads and drainable blades in 4" deep frames.
 - 1. Blades shall be positioned at 37 degree and 45 degree angles; approximately on 4" centers.
 - 2. Incorporate an integral drain gutter into the head and each stationary blade to drain water drain to ends of each blade and head.
 - 3. Incorporate an integral downspout into each jamb to drain water from the end of each blade and head, down the downspouts, and out at the louver sill; rather than cascading from blade to blade.
 - 4. Incorporate integral aluminum extended sill at bottom of louver.
- B. Construction: Welded construction with louver frames and blades fabricated of extruded aluminum, alloy 6063-T5, minimum 0.08-inch thickness.
- C. Screens: Provide framed, removable, rear-mounted bird screens constructed of aluminum wire mesh with no less than 0.063-inch wire diameter and ½-inch mesh openings.
- D. Wind Loading: Design factory-assembled louver sections to withstand wind loadings of 25 pounds per square foot.
- E. Finish: Provide clear anodized or color anodized finish as selected by Owner.
 - 1. Clear Anodized Finish: Minimum 0.7 mil thick clear anodized finish in accordance with AA-M10C22A41.
 - 2. Color Anodized Finish: Minimum 0.7 mil thick color anodized finish in accordance with AA-M10C22A44 in color selected by the Owner.
- F. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

- G. Acceptable Products: Subject to compliance with requirements, provide one of the following:
 1. Greenheck Model ESD-403.
 2. Ruskin Model ELF-375DX.
 3. No exceptions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install the work of this Section in accordance with the approved Shop Drawings and the recommendations of the manufacturers as approved by the Engineer.
- B. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- C. Anchor all components firmly into position using concealed anchorages where possible. Provide synthetic washers fitted to screws where required to protect metal surfaces and to make a weather-tight connection.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- G. Wall Opening Sleeves: In walls other than fiberglass construction, provide aluminum sheet metal sleeves in wall openings to form an air-tight connection between the exterior and interior wall openings; comply with requirements of Section 23 00 00, HEATING, VENTILATING, AND AIR CONDITIONING (HVAC).
 1. Set aluminum in asphaltic mastic where sleeves are installed in concrete or masonry wall openings.
 2. Terminate sleeves flush with outside louver surface.
 3. Terminate sleeves with 1.25-inch wide extruded aluminum border with mitered corners at inside wall surface.

LOUVERS

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- 4. Install louvers in wall openings only after aluminum sleeves have been installed.
- H. Support louver frames, mullions, and section joints adequately from the building structure to withstand wind loadings of 25 pounds per square foot.
- I. Seal exterior louver perimeter to wall opening according to manufacturer's installation instructions.

3.3 CLEANING

- A. Clean exposed surfaces of louvers that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Owner, remove damaged units and replace with new units.
- D. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gypsum wallboard system as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GYPSUM WALLBOARD

- A. General:
 - 1. Provide gypsum wallboard complying with ASTM C36 and ASTM C1396, in 48-inch widths and in such lengths as will result in a minimum of joints.

2. Regular wallboard: Provide Type III, Grade R, Class 1, 1/2-inch thick except as may be shown otherwise on the Drawings.
 3. Fire retardant wallboard: Provide Type III, Grade X, Class 1 5/8-inch thick.
 4. Water-resistant wallboard: Provide Type VII, Grade W or X as required, Class 2, 5/8-inch thick except as may be shown otherwise on the Drawings.
- B. Shaft walls: Where so indicated on the Drawings, provide gypsum wallboard system specifically designed for encasing shafts of the required fire-resistivity, and complying with ASTM C36 and ASTM C1396, Type IV, Grade R or X, Class 1, in the dimensions shown or otherwise required.

2.2 METAL TRIM

- A. Form from zinc-coated steel not lighter than 26 gauge, complying with Federal Specification QQ-S-775, Type I, Class D or E.
- B. Casing beads:
1. Provide channel-shapes with an exposed wing, and with a concealed wing not less than 7/8-inch wide.
 2. The exposed wing may be covered with paper cemented to the metal, but shall be suitable for joint treatment.
- C. Corner beads: Provide angle shapes with wings not less than 7/8-inch wide and perforated for nailing and joint treatment, or with combination metal and paper wings bonded together, not less than 1 1/4-inch wide and suitable for joint treatment.
- D. Edge beads for use at perimeter of ceilings:
1. Provide angle shapes with wings not less than 3/4-inch wide.
 2. Provide concealed wing perforated for nailing, and exposed wing edge folded flat.
 3. Exposed wing may be factory finished in white color.

2.3 JOINT TAPING SYSTEM

- A. Provide a joint taping system, including reinforcing tape and compound, designed as a system to be used together and as recommended for this use by the manufacturer of the gypsum wallboard approved for use on the Work.
- B. Joint compound may be used for finishing if so recommended by its manufacturer.

2.4 FASTENING DEVICES

- A. For fastening gypsum wallboard in place on metal studs and metal channels, use flat-head screws, shouldered, specially designed for use with power-driven tools, not less than 1-inch long, with self-tapping threads and self-drilling points.
- B. For fastening gypsum wallboard in place on wood, use 1 1/4-inch Type W buglehead screws, or use annular ring type nails complying with ASTM C514 and of the length required by governmental agencies having jurisdiction.

2.5 ACCESS DOORS

- A. In partitions and ceilings installed under this Section, provide doors where required for access to attic space, mechanical installations and electrical installations.
- B. Types:
 - 1. Unless otherwise required, provide 24-inch x 24-inch x 1/2-inch plywood access doors with trims and frame.
 - 2. For piercing fire-rated surfaces, provide access doors having the same fire rating as the surface being pierced.

2.6 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Install the gypsum wallboard in accordance with the Drawings and with the separate boards in moderate contact but not forced in place.
 - 2. At internal and external corners, conceal the cut edges of the boards by the overlapping covered edges of the abutting boards.
 - 3. Stagger the boards so that corners of any four boards will not meet at a common point except in vertical corners.
- B. Ceilings:
 - 1. Install the gypsum wallboard to ceilings with the long dimension of the wallboard at right angles to the supporting members.
 - 2. Wallboard may be installed with the long dimension parallel to supporting members that are spaced 16-inch on centers when attachment members are provided at end joints.
- C. Walls:
 - 1. Install the gypsum wallboard to studs at right angles to the furring or framing members.
 - 2. Make end joints, where required, over framing or furring members.
- D. Attaching:
 - 1. Drive the specified screws with clutch-controlled power screwdrivers, spacing the screws 12-inch on center at ceilings and 16-inch on centers at walls.
 - 2. Where framing members are spaced 24 inches apart on walls, space screws 12-inch on centers.
 - 3. Attach double layers in accordance with the pertinent codes and the manufacturer's recommendations as approved by the Engineer.

4. Attach to wood as required by governmental agencies having jurisdiction.

3.2 JOINT TREATMENT

A. General:

1. Inspect areas to be joint treated, verifying that the gypsum wallboard fits snugly against supporting framework.
2. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55 degrees for 24 hours prior to commencing the treatment, and until joint and finishing compounds have dried.
3. Apply the joint treatment and finishing compound by machine or hand tool.
4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.

B. Embedding compounds:

1. Apply to gypsum wallboard joints and fastener heads in a thin uniform layer.
2. Spread the compound not less than 3-inch wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Then spread a thin layer of compound over the tape.
3. After this treatment has dried, apply a second coat of embedding compound to joints and fastener heads, spreading in a thin uniform coat to not less than 6-inch wide at joints, and feather edged.
4. Sandpaper between coats as required.
5. When thoroughly dry, sandpaper to eliminate ridges and high points.

C. Finishing compounds:

1. After embedding compound is thoroughly dry and has been completely sanded, apply a coat of finishing compound to joints and fastener heads.
2. Feather the finishing compound to not less than 12-inch wide.
3. When thoroughly dry, sandpaper to obtain a uniformly smooth surface, taking care to not scuff the paper surface of the wallboard.

3.3 CORNER TREATMENT

- #### A. Internal corners: Treat as specified for joints, except fold the reinforcing tape lengthwise through the middle and fit neatly into the corner.

B. External corners:

1. Install the specified corner bead, fitting neatly over the corner and securing with the same type fasteners used for installing the wallboard.
2. Space the fasteners approximately 6-inch on centers, and drive through the wallboard into the framing or furring member.
3. After the corner bead has been secured into position, treat the corner with joint compound and reinforcing tape as specified for joints, feathering the joint compound out from 8-inch to 10-inch on each side of the corner.

3.4 OTHER METAL TRIM

A. General:

1. The Drawings do not purport to show all locations and requirements for metal trim.
2. Carefully study the Drawings and the installation, and provide all metal trim normally recommended by the manufacturer of the gypsum wallboard used in this Work.

3.5 CLEANING UP

- A. In addition to other requirements for cleaning, use necessary care to prevent scattering gypsum wallboard scraps and dust, and to prevent tracking gypsum and joint finishing compound onto floor surfaces.
- B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris, and surplus material of this Section.

END OF SECTION

SECTION 09 90 00

PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Paint and finish exposed surfaces using the combination of materials listed on Painting Schedule in Part 3 of this Section, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Priming or priming and finishing of certain surfaces may be specified to be factory-performed or installer-performed under pertinent other Sections.
- C. References:
 - 1. Reserved.
- D. Work not included:
 - 1. Metal surfaces of submerged galvanized metal more than 12 inches below water surface, anodized aluminum, stainless steel, chromium plate, and similar finished materials will not require painting under this Section except as may be so specified in other Sections of these Specifications.
 - 2. Do not paint moving parts of operating units; mechanical or electrical parts such as valve operators; linkages; sensing devices; and motor shafts, unless otherwise specified.
 - 3. Do not paint over required labels or equipment identification, performance rating, name, or nomenclature plates.
 - 4. Do not paint explosion-proof light fixtures, junction boxes, fittings or accessories.
- E. Definitions:
 - 1. "Paint" as used herein, means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Materials list of items proposed to be provided under this Section.
 - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

PAINTING AND COATING

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3. Color charts for selection of colors by the Owner.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees:
 1. Contractor Qualifications - Provide certification of previous experience and equipment necessary to apply/install the specified painting and coating systems.
- D. Lubricants – None Required.
- E. Spare Parts – None Required.
- F. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Paint coordination:
 1. Within 35 calendar days after the Contractor has received the Engineer's Notice to Proceed, arrange a conference with a technical representative of the paint manufacturer, the Engineer, the Contractor, and the Owner to:
 - a. review the paint systems to be used;
 - b. select colors;
 - c. review painting procedures; and
 - d. establish painting schedule.
 2. Notify the equipment manufacturers and miscellaneous metals fabricators of the correct shop primer to be used to assure compatibility of the total coating system.
 3. Review other Sections of these Specifications as required, verifying the prime coats to be used and assuring compatibility of the total coating system.
 4. Provide barrier coats over non-compatible primers, or remove the primer and reprime as required.
 5. Notify the Engineer in writing of anticipated problems in using the specified coating systems over prime-coatings supplied under other Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.
 1. Store materials in a safe, ventilated location.

2. Remove oily rags, waste, etc. every day and do not allow to accumulate under any circumstances.
3. Take precautions to prevent spontaneous combustion.

1.5 SITE CONDITIONS

- A. Do not apply paints when the temperature of surfaces to be painted and the surrounding air temperatures are below 50 degrees F, unless otherwise permitted by the manufacturers' printed instructions as approved by the Engineer.
- B. Weather conditions:
 1. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces, unless otherwise permitted by the manufacturers' printed instructions as approved by the Engineer.
 2. Applications may be continued during inclement weather only within the temperature limits specified by the paint manufacturer as being suitable for use during application and drying periods.

1.6 MAINTENANCE

- A. Upon completion of the work of this Section, deliver to the Owner an extra stock equaling 10 percent, but not less than one gallon, of each color, type, and gloss of paint used in the Work, tightly sealing each container, and clearly labeling with contents and location where used.

PART 2 - PRODUCTS

2.1 PAINT MATERIALS

- A. Acceptable materials:
 1. The Painting Schedule in Part 3 of this Section is based on products of the Tnemec Company, Inc., except where another manufacturer is named for a specific application.
 2. Products of other manufacturers may be submitted for review in accordance with provisions of the Contract. These products will be considered substitutions and will be reviewed by the Owner after Bids have been received.
 3. Where products are proposed other than those specified by name and number in the Painting Schedule, provide submittal required by Article 1.2 of this Section and a new painting schedule compiled in the same format used for the Painting Schedule included in this Section.
- B. Undercoats:
 1. Provide undercoat paint produced by the same manufacturer as the finish coat.

2. Insofar as practicable, use undercoat and finish coat material as parts of a unified system of paint finish.
- C. Provide all paints and materials supplied by one manufacturer.

2.2 APPLICATION EQUIPMENT

- A. For application of the approved paint, use only such equipment as is recommended for application of the particular paint by the manufacturer of the particular paint, and as approved by the Engineer.
- B. Prior to use of application equipment, verify that the proposed equipment is actually compatible with the material to be applied, and that integrity of the finish will not be jeopardized by use of the proposed equipment.

2.3 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed.
 1. Correct conditions detrimental to timely and proper completion of the Work.
 2. Do not proceed until unsatisfactory conditions are corrected.

3.2 MATERIALS PREPARATION

- A. General:
 1. Mix and prepare paint materials in strict accordance with the manufacturers' recommendations as approved by the Engineer.
 2. When materials are not in use, store in tightly covered containers.
 3. Maintain containers used in storage, mixing, and application of paint in a clean condition, free from foreign materials and residue.
- B. Stirring:
 1. Stir materials before application, producing a mixture of uniform density.
 2. Do not stir into the material any film which may form on the surface, but remove the film and, if necessary, strain the material before using.

3.3 SURFACE PREPARATION

A. General:

1. Perform preparation and cleaning procedures in strict accordance with the paint manufacturers' recommendations as approved by the Engineer.
2. Remove removable items such as hardware, accessories, nameplates, fixtures which are in place and are not scheduled to receive paint finish; or provide surface applied protection prior to surface preparation and painting operations.
3. Following completion of painting in each space or area, reinstall the removed items by using workmen who are skilled in the necessary trades.
4. Clean each surface to be painted prior to applying paint or surface treatment.
5. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall onto wet newly painted surfaces and other surfaces.

B. Preparation of wood surfaces:

1. Fill, prime and clean wood surfaces until free from dirt, oil, and other foreign substance.
2. Smooth finished wood surfaces exposed to view, using the proper sandpaper to produce a uniformly smooth and unmarred wood surface.

C. Preparation of metal surfaces:

1. Thoroughly clean surfaces until free from dust, dirt, black oxide, scale, rust, paint, oil, and grease in accordance with The Society for Protective Coatings (SSPC) Specifications required in Paint Schedule.
2. On galvanized surfaces, prepare in accordance with the methods outlined in ASTM D 6386-99 Standard Practice for Preparation of Zinc (Hot Dipped Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.

D. Preparation of concrete and masonry surfaces:

1. Clean concrete and masonry surfaces by the methods outlined in SSPC SP-13, Surfaces Preparation of Concrete. Use wire brushing, scraping, high pressure water cleaning, mechanical abrasion, blast tracking, or sandblasting as necessary and as required on the Paint Schedule. Vacuum clean, air blast clean or water clean to remove dirt, dust and loose material. Steam clean or detergent clean to remove oils and grease, efflorescence, stains and contaminants.
2. Allow new concrete and masonry to cure a minimum of 28 days before paint application.
3. Level protrusions and mortar spatter.

E. Preparation of Ductile and Cast Iron Surfaces:

1. Solvent clean in accordance with NAPF 500-03-01 Surface Preparations Standard for Solvent Cleaning.

2. Abrasive Blast Cleaning of Ductile and Cast Iron:
 - a. For external pipe surfaces, abrasive blast clean in accordance with NAPF 500-03-04 Surface Preparations Standards for Abrasive Blast Cleaning – External Pipe Surfaces.
 - b. For internal pipe surfaces, abrasive blast clean in accordance with NAPF 500-03-04 Surface Preparations Standards for Abrasive Blast Cleaning – Internal Pipe Surfaces.

3.4 PAINT APPLICATION

- A. General:
 1. Touch-up shop-applied prime coats which have been damaged, and touch-up bare areas prior to start of finish coats application.
 2. Notify the Engineer or the Owner of the completion of each coat.
 - a. Do not apply additional coats until the completed coat has been inspected and approved.
 - b. Only the inspected and approved coats of paint will be considered in determining the number of coats applied.
 3. Do all necessary touching up after other mechanics have finished and leave entire work in a neat and clean condition.
 4. Do not leave paint spots on glass, hardware, floors, or other finished work.
 5. If required by the Engineer, tint by mixing a small amount of white paint of the exact same type with any or all paint used prior to the final coat so that the area covered by the application of each coat is readily discernible.
 6. Provide an approved gauge for determining the mil thickness of the paint on a surface.
- B. Drying:
 1. Allow sufficient drying time between coats, modifying the period as recommended by the material manufacturer to suit adverse weather conditions.
- C. Brush applications:
 1. Apply the painting materials by brush and work the brush coats onto the surface in an even film.
 2. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, and other surface imperfections will not be acceptable.
- D. Spray application:
 1. Except as specifically otherwise approved by the Engineer, confine spray application to metal and similar surfaces where hand brush work would be inferior.
 2. Where spray application is used, apply each coat to provide the hiding equivalent of brush coats.
 3. Do not double back with spray equipment to build up film thickness of two coats in one pass.
 4. Protect other surfaces from over spray.

- E. For completed work, match the approved texture, color, and coverage. Remove, refinish, or repaint work not in compliance with the specified requirements.

3.5 PAINTING SCHEDULE

Dry Film - mils

- A. Steel, iron, galvanized and non-ferrous metal; tanks, pipes, conduits, electrical boxes, and equipment:
1. Interior, non-immersion: System Series N69 Hi-Build Epoxoline II.
 - a. Surface preparation: SSPC-SP6 Commercial Blast Cleaning for ferrous metal; ASTM D 6386-99 for galvanized; scarify non-ferrous metal; NAPF 500-03 for cast & ductile iron.
 - b. 1st Coat: Tnemec Series 1 Omnithane. 2.5 - 4.0
 - c. 2nd Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. (2-3 mil dft for galvanized and non-ferrous metal.) 4.0 - 6.0
 - d. 3rd Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. (2-3 mil dft for galvanized and non-ferrous metal.) 4.0 - 6.0
10.5 - 16.0
- B. Concrete:
1. Interior floor: System #2 – Thin Film 100% Solid Epoxy, Orange peel finish*.
 - a. Surface Preparation: Allow new concrete to cure 28 days, verify dryness. Moisture content not to exceed 3 pounds per 1,000 square feet in a 24-hour period. Shot blast or mechanically abrade to remove laitance curing compounds, hardeners, sealers and other contaminants and to create profile. Reference ICRI CSP -3. Fill large holes and voids as recommended by the coating manufacturer.
 - b. 1st Coat: Tnemec Series 201 Epoxoprime. 6.0 - 12.0
 - c. 2nd coat: Tnemec Series 280-color Tnemec Glaze**. 6.0 - 12.0
 - d. 3rd coat: Tnemec Series 280-color Tnemec Glaze. 6.0 - 12.0
18.0 - 36.0
- C. Concrete Block and Split Face Concrete Block:
1. Interior: System Series N69 Hi-Build Epoxoline II.
 - a. Surface Preparation: Allow new mortar to cure 28 days, level protrusions and mortar spatter.

Dry Film - mils

- | | | |
|----|--|----------------------|
| b. | 1 st Coat: Tnemec Series N69-W6160 Hi-Build Epoxoline II. | 75-100 sq. ft./gal. |
| c. | 2 nd Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. | 3.0 - 4.0 |
| d. | 3 rd Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. | <u>3.0 - 4.0</u> |
| | | (Topcoats) 6.0 - 8.0 |
- D. Plaster and Gypsum Wallboard:
- | | | |
|----|--|------------------|
| 1. | Interior: System Series 113 H.B. Tneme-Tufcoat. | |
| a. | Surface preparation: Clean and dry. | |
| b. | 1 st Coat: Tnemec Series 151-1051 Elasto-Grip FC. | 1.0 - 1.5 |
| c. | 2 nd Coat: Tnemec Series 113 H.B. Tneme-Tufcoat. | 2.0 - 3.0 |
| d. | 3 rd Coat: Tnemec Series 113 H.B Tneme-Tufcoat. | <u>2.0 - 3.0</u> |
| | | 5.0 - 7.5 |
- E. PVC:
- | | | |
|----|--|------------------|
| 1. | Interior: System Series N69 Hi-Build Epoxoline II. | |
| a. | Surface Preparation: Hand Sand to Scarify. | |
| b. | 1 st Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. | 2.0 - 3.0 |
| c. | 2 nd Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. | <u>2.0 - 3.0</u> |
| | | 4.0 - 6.0 |
| 2. | Exterior: System Series 1075 Endura-Shield II. | |
| a. | Surface Preparation: Hand Sand to Scarify. | |
| b. | 1 st Coat: Tnemec Series N69-Color Hi-Build Epoxoline II. | 2.0 - 3.0 |
| c. | 2 nd Coat: Tnemec Series 1075 Endura-Shield II. | <u>2.0 - 3.0</u> |
| | | 4.0 - 6.0 |

3.6 EXISTING SURFACES

- A. General:
1. Paint existing structures, equipment, piping, conduit, and appurtenances that remain in use as part of the Project as listed below.
 2. Comply with coating manufacturer's recommendations for surface preparation and painting of existing surfaces.
 3. Refer to 0 Schedule for coating systems.

Dry Film - mils

- B. Containment & Disposal requirements:
1. When required by federal, state or local regulation, enclose the entire tank or structure and contain surface preparation debris. Refer to SSPC-GUIDE 6 (CON), "Guide for Containing Debris Generated During Paint Removal Operations".
 2. Dispose of surface preparation debris in accordance with applicable federal, state and local regulations. Refer to SSPC-GUIDE 7 (DIS).
 3. Provide containment, tests, permits, transportation and disposal of all waste resulting from surface preparation in strict accordance with Illinois EPA regulations.

3.7 PIPELINE IDENTIFICATION COLORS AND LABELS

- A. Paint pipelines including fittings and valves with the following color scheme:
1. Chlorine lines: 02SF Safety Yellow

END OF SECTION

SECTION 22 19 13
PIPE AND PIPE FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide pipe and pipe fittings as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Provide labor, materials, tools, chemicals and equipment necessary to perform the pressure and leakage tests and disinfection.
- C. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- D. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Lubricants – None Required.
- E. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Perform shop and field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.
 - 1. Provide the services of an independent testing laboratory to take and test weld specimens or otherwise test welds to verify proper welding procedures as required by the Engineer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 STEEL PIPE AND FITTINGS

- A. Welded steel pipe and fittings:
 - 1. Pipe: Comply with ASTM A-53 and AP1-5L for black seamless and welded pipe.
 - a. Pipe sizes 12-inch diameter and smaller: ASA Schedule 40 weight and wall thickness.
 - b. Pipe sizes 14-inch and larger: ASA Standard weight and 0.375-inch wall thickness.
 - 2. Pipe flanges and fittings: Continuous weld type conforming to ANSI B16.5.
 - 3. Connections: Continuous butt weld type.
 - a. Welding procedures: Conform to ANSI B31.1.
 - b. Minimum yield strength of welded joints: 35,000 psi.
 - 4. Provide extruded plastic coatings, Standard X-TRU-COAT, or equal, for underground steel pipe.
 - a. Make field joints and repairs with thermofit pipe sleeves, or primer and plastic, or hot applied coal tar tapes.
- B. Galvanized steel pipe and fittings:
 - 1. Pipe: Comply with ASTM A-53, ASA Schedule 40 weight and wall thickness.
 - 2. Fittings: Use 150-pound galvanized malleable iron screwed end fittings.
- C. Stainless steel pipe and fittings:
 - 1. Pipe sizes 2½-inch and smaller:
 - a. Comply with ASTM A-312, Schedule 40, Type 316L seamless stainless steel pipe.
 - b. Fittings: Use 150 LB. 316 stainless steel screwed fittings.
 - c. In lieu of screwed fittings, Victaulic Vic-Press 304 System may be used.
 - (1) Provide pipe that is approved for use with the Vic-Press 304 system.
 - (2) O-Rings: Grade "E" EPDM (green color code).
 - (3) Ball valves: see Section 22 19 23.
 - (4) Pipe supports: provide supports as specified in Part 3 of this Section and do not exceed spans recommended by Victaulic for the Vic-Press 304 system.
 - 2. Pipe sizes 3-inch and larger:
 - a. Piping system: Mechanical Grooved Piping System conforming to ANSI-B-31.1, B-31.3, AND B-31.9.
 - b. Pipe: comply with ASTM A-778, Schedule 10, Type 304L welded unannealed austenitic stainless steel pipe.

- c. Fittings: smooth turn, full flow Type 304L stainless steel fittings or segmentally welded fittings with grooves designed to accept to specified couplings.
- d. Joints:
 - (1) Rolled or cut-grooved-ends as appropriate to pipe material, wall thickness, pressures, size, and method of joining.
 - (2) Groove pipe ends in accordance with ANSI/AWWA C-606.
- e. Couplings 3" to 12":
 - (1) Victaulic Style 489 stainless steel rigid coupling, or equal.
 - (2) Meet requirements of ASTM F-1476.
 - (3) Housing: Type 316 stainless steel, conforming to ASTM A-351, A-743, and A-744 Grade CF-8M.
 - (4) Housing coating: none.
 - (5) Gaskets: Grade "E" EPDM (green color code) compound conforming to ASTM D-2000 designation 2CA615A25B24F17Z.
 - (6) Bolts and nuts: Type 316 stainless steel, oval neck track bolts and heavy hexagonal nuts with chemical and physical properties of ASTM F-593, Group 2, Condition CW.
- f. Couplings 14" and over:
 - (1) Provide flexible couplings as specified later in this Section.

2.2 POLYVINYL CHLORIDE PIPE

- A. General:
 - 1. Make polyvinyl chloride (PVC) pipe and fittings of Class 12454B material conforming to ASTM D1784.
- B. PVC pressure pipe and fittings:
 - 1. Use Schedule 80 with a minimum pressure rating of 125 psi at 73 degrees F, conforming to ASTM D1785.
 - 2. Joints: Use solvent-weld socket type, threaded type, or flanged type.

2.3 POLYVINYL CHLORIDE PIPE – UNDERGROUND INSTALLATION

- A. General:
 - 1. Pipe material: Use Class 12454A or B polyvinyl chloride complying with ASTM D1784.
- B. PVC pressure pipe and fittings:
 - 1. Pipe 12-inch and smaller:
 - a. Comply with AWWA C-900 for Class 235 pressure pipe with a standard dimension ratio of 18, or
 - b. Use Schedule 80 with solvent-weld socket type joints.

2.4 PVC SMALL DIAMETER CLOSE PROFILE (DOUBLE-WALL) PIPE

- A. Provide PVC resin that meets cell class 12454 per ASTM D1784, with a minimum pipe stiffness of 115 psi (SDR 26 equivalent).

- B. Joints: Meet tightness requirements of ASTM D3212.
- C. Gaskets: Meet ASTM F477.
- D. Acceptable products:
 - 1. Contech A-2026 pipe;
 - 2. Or equal.

2.5 TUBING

- A. Flexible plastic tubing:
 - 1. Use polyethylene tubing with natural color.
 - 2. Wall thickness: 0.040-inch for 1/4-inch tubing and 0.062-inch for 3/8-inch tubing.
 - 3. Fittings: Use instrumental type for unions, connectors, and caps.
- B. Copper tubing and fittings:
 - 1. Comply with ASTM B88 OR ANSI H23.1.
 - 2. Use Type K soft temper seamless tubing for underground piping.
 - 3. Use Type L rigid hard temper seamless tubing for interior piping.
 - 4. Fittings: Use wrought copper solder type conforming to ANSI B16.22.
 - a. Do not use lead solder for potable water piping.
- C. Stainless steel tubing and fittings:
 - 1. Use Seamless Type 304 tubing conforming to ASTM A269 with wall thickness 0.035-inch.
 - 2. Use high pressure stainless steel compression sleeve type fittings.

2.6 INSULATING COUPLINGS

- A. Provide insulating couplings for dielectric protection from electrolytic corrosion on piping where dissimilar metals (copper to steel, etc.) are joined.
 - 1. Use inert, non-conductive, linen-impregnated laminate material for lining with standard NPS threaded ends.
 - 2. Acceptable products: Lochinvar V-Line Insulating Couplings, or equal.

PART 3 - EXECUTION

3.1 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items in accordance with the Drawings.

3.2 INSTALLATION OF PIPING

- A. General:
 - 1. Trench, backfill, and compact for the work of this Section in strict accordance with pertinent provisions of Section 31 23 79 of these Specifications.

2. Install pipe in accordance with pipe manufacturer's recommendations.
3. Lay pipe by proceeding upgrade with the spigot ends of bell-and-spigot pipe pointing in direction of flow.
4. Use proper and suitable tools and appliances for safe and convenient handling and installation of piping.
5. Continually clear interior of the pipe free from foreign material.
6. Before making pipe joints, clean and dry all surfaces of the pipe to be joined.
7. Use lubricants, primers, and adhesives recommended for the purpose by the pipe manufacturer.
8. Comply with ASTM D2321 for flexible thermoplastic sewer pipe installation.
9. Make adequate provision for expansion and contraction of piping.

B. Water main separation:

1. Whenever water mains are encountered in the course of piping installation, notify the Engineer to determine the construction necessary to comply with the provisions of Sections 31-1.02A of the "Standard Specifications for Water and Sewer Main Construction in Illinois".

C. Install unions or flanges at piping connections to each piece of equipment, at intervals of not more than 50 feet in straight runs of threaded pipe, at each valve, and wherever else required to disassemble piping for service of fittings, fixtures, equipment and appurtenances.

1. Use unions in piping sizes 3 inches and smaller.
2. Use flanges in piping sizes larger than 3 inches.
3. Make connections between ferrous and non-ferrous metal piping with dielectric type insulated unions or flanges.

3.3 EXISTING PIPING

- A. The Drawings show the approximate location of existing piping as indicated by available existing records. The proposed work may require crossing, relocating, and in some cases connecting to the existing piping.
- B. Expose carefully the existing piping throughout the area of proposed work.
 1. All existing piping to remain undisturbed and in uninterrupted use until such time as a change is approved by Engineer.
 2. Protect exposed piping from freezing during cold weather.
- C. Where new piping is to cross or be connected to existing piping, make a field check to determine whether any conflict will be encountered in laying the new pipe.
 1. Adjust the location of new piping, if necessary, as authorized by the Engineer, to avoid conflict with existing piping.
- D. Where new piping is to connect to existing piping, provide all fittings required to complete the connection, and do the work as expeditiously and carefully as possible.
- E. Remove and replace existing pipe, fittings, valves and all appurtenances as required by the Drawings.
 1. Adjust valve boxes as required to meet new finished grade elevations.

2. Provide new valve stems as required to place the operating nut 2 inches from the top of the valve box.
- F. In the event it becomes necessary, in the opinion of the Engineer, to alter the location of an existing pipe to accommodate construction of the new work, relocate or adjust the existing pipe as directed by the Engineer.
1. Additional compensation for this work will be paid for in accordance with the GENERAL CONDITIONS.

3.4 PIPING SUPPORTS

- A. General:
1. Design and provide complete system of supports and anchors for all piping, fittings, valves, fixtures and appurtenances.
 2. Absence of pipe supports and details on the Drawings shall not relieve the Contractor of responsibility for providing them.
 3. Design pipe support system to withstand dead loads imposed by weight of pipes filled with water plus test pressure and insulation (if required), with a minimum safety factor of 5.
 4. Paint pipe supports in accordance with Section 09 90 00.

- B. Types of support:
1. Piping adjacent to walls may be supported or braced by wall brackets.
 2. Floor pipe supports: Use adjustable with floor flanges, pipe stanchion, and saddle where they do not obstruct passage.
 3. Ceiling supported pipe hangers: Use adjustable steel clevis type with full diameter hanger rods conforming to the following sizes:

<u>Pipe Size</u>	<u>Minimum Rod Size</u>
1/2" - 2"	3/8"
2-1/2" - 3-1/2"	1/2"
4" - 5"	5/8"
6" - 12"	7/8"
14" - 16"	1"
18" - 20"	1-1/4"
24" - 30"	1-1/2"

- C. Support spacing:
1. For rigid pipes except PVC pipes:

<u>Pipe Size</u>	<u>Maximum Spacing</u>
1/2" - 2"	6'
2-1/2" - 3-1/2"	8'
4" - 5"	8'
6" - 12"	9'
14" - 16"	9'
18" - 20"	9'
24" - 30"	9'

2. For PVC Schedule 80 pipes:

<u>Pipe Size</u>	<u>Maximum Spacing</u>
3/4" and smaller	continuous rigid support
1" - 1-1/2"	4'
2" - 2-1/2"	5'
3"	6'
4" and larger	7'

3. For flexible hose and tubing:
 - a. Provide continuous support by means of rigid carrier pipes or troughs consisting of structural channels or angles which are supported at intervals of 10 feet or less.
4. Provide a minimum of two pipe supports for each pipe run.

- D. Thrust anchors and guides:

1. Provide thrust anchors and guides to resist thrust due to changes in pipe sizes or direction, or dead end of pipes.

3.5 PIPE RESTRAINING SYSTEMS FOR UNDERGROUND PRESSURE PIPING

- A. General:

1. Provide protection from movement of pressure piping, plugs, caps, tees, valves, hydrants, and bends of 11-1/4 degrees or greater.
2. Provide concrete thrust blocks at all locations noted in A.1 unless restrained joint type fittings are utilized.
3. Where restrained joint type fittings are called for on the Drawings, but cannot be utilized, provide concrete thrust blocks.

- B. Concrete thrust blocks:

1. Provide precast or cast-in-place concrete thrust blocking with a compressive strength of 3000 psi in 28 days.
2. Locate thrust blocking between solid ground and the fitting to be anchored.
3. Unless otherwise shown or directed by the Engineer, place the base and thrust bearing sides of thrust blocking directly against undisturbed earth.
4. Sides of thrust blocking not subject to thrust may be placed against forms.
5. Place thrust blocking so the fitting joints will be accessible for repair.
6. When conditions prevent the use of concrete thrust blocks, use tie rods or restrained joints of an approved type.

- C. Restrained type pipe and fittings:

1. Provide restraining system as outlined in Part 2 of this Section or utilize metal tie rods, clamps, and lugs to prevent pipe and appurtenances from movement.
 - a. Protect tie rods and clamps with epoxy or bituminous paint.
 - b. Protect all restrainers used for PVC fittings with a double layer of polyethylene wrapping or tubing.
2. Where utilizing restrained joint pipe system to immobilize joints or fittings, provide restrained joint pipe to distance indicated on the Drawings, or not

PIPE AND PIPE FITTINGS

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less than a minimum of three pipe lengths on each side of the bend or fitting to be restrained.

- a. Utilization of restrained joint pipe as a substitute to concrete thrust blocking is done at the Contractor's option at no additional cost to the Owner.

3.6 PRESSURE CONNECTION

- A. Support the exposed existing water main on concrete pedestals at sufficient intervals to properly carry its own weight, plus the weight of the tapping machinery and fitting. Provide thrust blocking.
- B. Minimum tap hole diameter:
 1. For pipe 12-inch or smaller: 1/2-inch less than the nominal pipe diameter.
 2. For pipe 14-inch through 20-inch: 1½-inch less than the pipe diameter.
- C. Open valve to flush any foreign material after completion of the pressure tapping.

3.7 POLYETHYLENE WRAPPING OF DUCTILE IRON PIPE AND APPURTENANCES

- A. Comply with requirements of ANSI/AWWA C105/A21.5-99.
 1. Place polyethylene sheet around the entire circumference of the pipe, tie or tape sheet securely to prevent displacement during backfilling.
 2. Wrap all water mains, fittings, valves, fire hydrant leaders, fire hydrants, service lines, or other pipe where indicated on the Drawings.
 - a. Wrap copper service lines to a point 3 feet from center of water main.
 - b. Do not block fire hydrant weep hole.

3.8 CONDUCTIVITY APPURTENANCES

- A. Install conductivity through joints by use of conductivity wedges or copper cable and taps.
 1. Use two (2) wedges per joint for pipes 12 inches or smaller, and four (4) wedges per joint for pipe sizes larger than 12 inches.
 2. Use number of copper cable connectors per joint as recommended by the pipe manufacturer.

3.9 TESTING AND INSPECTING

- A. Hydrostatic tests:
 1. Where any section of a pressure piping is provided with concrete thrust blocking, do not make hydrostatic tests until at least 5 days after installation of the concrete thrust blocking, unless otherwise directed by the Engineer.
 2. Devise a method for disposal of waste water from hydrostatic tests, and for disinfection, as approved in advance by the Engineer.
- B. Testing of pressure piping:
 1. Subject the pressure piping to the following hydrostatic pressure:
 - a. Water, sewage, and sludge piping with a normal operating pressure of 20 psig or greater: 125 psig.

- b. Water, sewage, and sludge piping with a normal operating pressure of less than 20 psig: 50 psig.
 - c. Water, sewage, and sludge pump suction piping: Negative pressure of 7 psig.
 - d. Air and gas piping: Pneumatic pressure of 15 psig.
 - 2. Hold the test pressure for a duration of 30 minutes without pressure loss or further pressure application.
 - 3. Replace or remake joints showing visible leakage.
 - 4. Remove cracked pipe, defective pipe, and cracked or defective joints, fittings, and valves. Replace with sound material and repeat the test until results are satisfactory.
 - 5. Make repair and replacement without additional cost to the Owner.
 - 6. Do not test against existing valves.
- C. Testing of non-pressure piping:
- 1. Test all non-pressure piping for watertightness by the low pressure air testing, or exfiltration, or infiltration method as selected by the Engineer.
 - 2. Low pressure air test:
 - a. Prior to testing for leakage, flush and clean the lines by passing a snug-fitting inflated rubber ball through the line by upstream water pressure.
 - b. Seal pipe openings with airtight plugs and braces.
 - c. Whenever the line to be tested is submerged under groundwater, insert a pipe probe by boring or jetting into the backfill material adjacent to the center of the line to determine the groundwater hydrostatic pressure by forcing air to flow slowly through the probe pipe.
 - d. Add air to the plugged pipe sections under test until internal air pressure reaches 4.0 psig greater than any groundwater hydrostatic pressure.
 - e. Allow at least two minutes for air temperature to stabilize and adding air to maintain the initial test pressure.
 - f. Shut off the air supply after stabilizing the air temperature and record the time in seconds using an approved stopwatch for the internal pressure to drop from 3.5 psig to 2.5 psig greater than any groundwater hydrostatic pressure.
 - g. Allowable limits: Total rate of air loss not to exceed 0.0030 cubic feet of air per minute per square foot of internal pipe area.
 - h. If the air test fails to meet these requirements, locate and repair, or remove and replace the faulty sections of pipe in a manner approved by the Engineer, as necessary to meet the allowable limits upon retesting.
 - i. Do not use acrylamid gel sealant to correct leakage.
 - 3. Water exfiltration tests:
 - a. Seal the section of pipe to be tested by inserting inflatable rubber stoppers or by other means approved by the Engineer.
 - b. Fill the pipe with water to a point two feet above the top of the pipe at the upper end; or, if groundwater is present, two feet above the

- average adjacent groundwater level for a period of not less than 24 hours prior to measuring leakage.
- c. Measure the leakage by the amount of water added to maintain the water level at that level for a period as required by the Engineer but not less than one hour.
- 4. Water infiltration test:
 - a. If, in the opinion of the Engineer, excessive groundwater (a minimum of 24 inches above the top of the pipe) is encountered in the construction of a section of the pipe, the exfiltration test shall not be used.
 - b. Close the end of the pipe at the upper structure sufficiently to prevent the entrance of water.
 - c. Pump out groundwater in the pipe to allow the infiltration to come to equilibrium, then test for infiltration.
- 5. Allowable limits for water infiltration or exfiltration test: Not to exceed 200 gallons per inch of pipe diameter per 24 hours per mile of pipe.
- 6. Provide and use measuring devices approved by the Engineer.
- 7. Provide materials, and labor for making required tests.
- 8. Make tests in the presence of the Engineer, giving the Engineer at least three days advance notice of being ready for test observation.

3.10 WATER SYSTEM DISINFECTION

- A. General:
 - 1. After the potable water system has been satisfactorily completed and tested, disinfect the work in accordance with AWWA C651, and "Standard Specifications for Water and Sewer Main Construction in Illinois".
- B. Forms of applied chlorine:
 - 1. Apply chlorine by the dry gas feeder unless solution feed chlorination, solution of chlorine-bearing compounds, or tablet method are approved by the Owner.
 - a. Provide effective diffusion of the gas into the water within the water main and regulating the rate of gas flow.
 - b. Provide means for preventing the backflow of water into the chlorinator.
 - 2. Chlorine-bearing compounds in water:
 - a. Apply solution of calcium hypochlorite granular or sodium hypochlorite into one end of the section of main to be disinfected while filling the main with water.
 - 3. Tablet method:
 - a. Apply tablet of calcium hypochlorite to short extensions only.
 - b. Utilize only when scrupulous cleanliness has been used in construction.
 - c. Do not use if trench water or foreign material has entered the water piping or if the water is below 41 degrees F. Place tablets at the top of the main and attach by an adhesive, such as Permatex No. 1.
 - d. Place crushed tablets inside the annular space of the pipe joints.

- C. Requirement of chlorine:
 - 1. Apply disinfecting solutions having at least 50 mg/l of available chlorine.
 - 2. Retain the disinfecting solutions in the work for at least 24 hours.
 - 3. Chlorine residual after the retention period: At least 25 mg/l.
- D. Flushing and testing:
 - 1. Following chlorination, flush treated water thoroughly from the water system until the chlorine concentration in the water flowing from the system is no higher than generally prevailing in the Owner's system, or less than 1 mg/l.
 - 2. After flushing, collect two water samples on successive days at least 24 hours apart in sterile bottles treated with sodium thiosulfate. Notify the Engineer and the Owner to witness sample collection.
 - 3. The Owner will deliver the samples to a state approved laboratory for bacteriological analysis.
 - 4. Should the initial disinfection result in an unsatisfactory bacterial test, repeat the chlorination procedure until satisfactory results are obtained.
 - 5. The Owner will provide the water for initial flushing and testing only. Compensate the Owner for water used in subsequent flushing and testing.
- E. Swabbing:
 - 1. Flush and swab the piping, valves, and fittings that must be placed in service immediately and cannot be disinfected by the above specified methods, with five percent solution of calcium hypochlorite prior to assembly.
 - a. Secure the Engineer's approval before applying this method of disinfection.

3.11 DECHLORINATION

- A. Comply with AWWA C651-05 requirements to neutralize the residual chlorine in new water mains.
- B. After new water mains have passed disinfection requirements, utilize portable diffusing dechlorinators that utilize sulfur dioxide or other chemicals listed in Appendix C of AWWA C651 to lower chlorine residuals prior to discharge to the drainage system.
 - 1. Lower concentration to 1 mg/l or less.

END OF SECTION

SECTION 22 19 23

VALVES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide valves as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 – General Requirements of these Specifications.
 - 2. Valves furnished as part of factory-fabricated equipment are specified as part of equipment assembly in other sections.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. General dimensions, construction details, and manufacturer's specifications.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Provide valves of same type by same manufacturer to greatest extent possible.
- B. Provide valves with manufacturer's name and pressure rating clearly marked on valve body.
- C. Ensure all brass and bronze alloys contain less than 15 percent zinc, unless otherwise specified.
 - 1. Brass that will come in contact with potable water shall contain no more than 0.25% lead.
 - a. Brass fittings shall be marked with industry standard marking to indicate the amount of lead (no lead, low lead, etc.) in the brass.

VALVES

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1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GLOBE VALVES

- A. Globe valves smaller than 3-inch size:
 - 1. Provide bronze body, composition disc, screwed-end type designed for 300-pound non-shock W.O.G.
- B. Globe valves 3-inch size and larger:
 - 1. Provide 125-pound iron body, bronze mounted, composition disc OS & Y type with ANSI Class 125 standard flange ends.
 - a. Provide chain wheels, chain guards, and galvanized chains for valves located higher than 6'-6" above the floor level.
- C. Acceptable manufacturers:
 - 1. Crane.
 - 2. Jenkins.
 - 3. Stockham.
 - 4. Lunkenheimer.
 - 5. Or equal.

2.2 PLUG VALVES

- A. General:
 - 1. Provide non-lubricated eccentric action type plug valves designed for a minimum water working pressure of 150 psi.
 - 2. Provide ASTM Standard A126 Class B cast iron bodies.
 - 3. Provide resilient plug facings of Neoprene or Hycar.
 - 4. Provide seats with a minimum 1/8-inch thick welded-in overlay of not less than 90 percent nickel content on all surfaces contacting the plug face on 3-inch size and larger valves.
 - 5. Provide bolted bonnets on all valves and adjustable packing and packing glands or self-adjusting U-cups which are accessible without disassembly of the valve or actuator on 4-inch size and larger valves.
 - 6. Open all plug valves by rotating operator counter-clockwise.
 - 7. Provide rectangular port and plug design.
- B. Provide valve pressure rating as follows and establish by hydrostatic test as specified by ANSI B16.1.
 - 1. Drip-tight shutoff up to full pressure rating.
 - 2. Drip-tight shutoff to full valve rating with pressure in either direction.
 - 3. Pressures:
 - a. 175 psi for valves through 12-inch.

- b. 150 psi for valves 14 through 54-inch.
- C. Provide ANSI Class 125 standard flanged ends for valves installed in flanged piping.
- D. Provide mechanical joint ends for valves installed in underground piping.
- E. Except for valves on digester gas lines or unless otherwise shown on the Drawings, provide 2-inch square operating nuts for operation by removable wrenches for 4-inch through 6-inch size valves.
- F. Unless otherwise shown on the Drawings, provide enclosed worm gear type actuator with handwheel or crank for 8-inch size and larger valves and for valves of all sizes on digester gas lines.
 - 1. Equip gear actuators with valve position indicator and adjustable stop to set closing torque with shaft and quadrant supported on permanently lubricated bronze bearings.
 - a. Provide zinc or cadmium plated exposed nuts, bolts, springs, and washers on non-submerged valves and actuators.
 - b. Rotate gear operator as required to prevent oil leakage.
 - 2. Provide chainwheels, chain guides, and galvanized chain for gear actuators located higher than 6'-6" above the floor level.
 - 3. Equip valves and gear actuators for underground or submerged installation with seals on all shafts and gaskets on the covers to prevent entry of water.
 - a. Provide totally enclosed actuator mounting brackets with gasket seals.
 - b. Provide stainless steel exposed nuts, bolts, springs, and washers on submerged and underground valves and actuators.
- G. 3-inch size and smaller valves:
 - 1. Provide threaded ends and integral, non-removable operating lever with adjustable open position memory stop.
- H. Acceptable manufacturers:
 - 1. DeZurik.
 - 2. Val Matic.
 - 3. Or equal.

2.3 PVC VALVES

- A. General:
 - 1. Manufacture PVC valves of Type 1, Grade 1 polyvinyl chloride thermoplastic conforming to the latest revised specification requirements of ASTM D1784.
 - 2. Provide socket type, threaded type, or ANSI Class 150 standard flange type valve ends.
- B. Ball valves:
 - 1. True union design with two-way blocking capability.

2. One-piece capsule feature, or threaded in seal carrier, or other positive means to prevent over-tightening seating components.
 3. Teflon seat and Viton O-ring seals.
- C. Check valves:
1. True union design ball check valves.
 2. Viton seat and O-ring seals.
- D. Acceptable manufacturers:
1. Asahi/America.
 2. Hayward Manufacturing Co., Inc.
 3. Nibco.
 4. Or equal.

2.4 HOSE VALVES

- A. Provide compression type valves with brass or bronze body, bonnet, stem and disc holder, rubber composition disc, removable wheel or tee handle, and 3/4-inch standard garden hose thread outlet connection.
1. 3/8-inch steel or brass operating rod and black steel or copper tube casing on frost-proof valves.
 2. Equip each hose valve with a vacuum breaker similar to Watts No. 8A, or equal.

2.5 BALL VALVES

- A. Brass ball valves:
1. Provide 2-inch and smaller, 2-way, ball valves for use with 2-inch and smaller tube and piping systems.
 - a. Body: Brass.
 - b. Ball stem, packing washers, seat retainers, and ball retainers: Brass.
 - c. Port adapters, packing nut: Brass.
 - d. Handle: Nylon.
 - e. Ball seat: Teflon.
 - f. Adapter and retainer seals: Teflon.
- B. Stainless steel ball valves:
1. Provide Victaulic Series 569, Vic-Press 316 Type 316 stainless steel ball valves.

2.6 PAINTING

- A. Comply with the pertinent provisions of Section 09 90 00.

PART 3 - EXECUTION

- 3.1 Install valves in accordance with manufacturer's recommendations.

END OF SECTION

VALVES
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SECTION 22 19 26

GAUGES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide gauges as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
 - 2. Gauges furnished as part of factory fabricated equipment are specified as part of equipment assembly in other sections.
 - 3. Refer to Division 22 piping systems sections for specific gauge applications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. General dimensions and manufacturer's specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide gauges with ranges shown on the Drawings or specified under Division 22 piping systems.

2.2 BOURDON TUBE TYPE PRESSURE GAUGES

- A. Provide phosphor bronze tube, brass socket, 4½-inch aluminum alloy case, white dial, and plastic glass lens.
 - 1. Provide 1/4-inch gauge cock and stainless steel cartridge snubber.
 - 2. For sewage and sludge gauges not equipped with instrument protectors, provide diaphragm seal units with removable cleanout rings.
- B. Provide ACCO Helicoid Type 410, or H.O. Trerice Company 500X, or equal.

2.3 INSTRUMENT PROTECTORS

- A. Provide instrument protectors for gauges where shown on the Drawings.
 - 1. Provide wafer ring type instrument protectors with carbon steel rings, Buna-N flexible cylinder and silicone oil sensing fluid.
 - a. Design to fit between ANSI Class 125 standard flanges of size shown on the Drawings.
 - 2. Provide Ronningen-Petter Iso-Ring, or Red Valve Company Series 48 Pressure Sensor, or equal.

PART 3 - EXECUTION

- 3.1 Install gauges and accessories in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 22 19 33

PIPE INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide pipe insulation as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Manufacturer's specifications and other data needed to assure compliance with specified requirements.
 - 2. Manufacturers' recommended installation procedures.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 PIPE INSULATION

- A. Provide pipe insulation with the following features:
 - 1. Flame-attenuated fiberglass bonded with thermosetting resin.

2. Service temperature: 850 degrees F maximum.
 3. All-service vapor barrier jacket.
 - a. Reinforced white kraft bonded to aluminum foil.
 - b. Factory-applied double pressure-sensitive adhesive system with matching pressure-sensitive butt strips.
 4. Exterior piping: Protect pipe insulation with 0.016-inch smooth or corrugated aluminum jacketing with factory-applied galvanic action barrier and 3/4-inch wide bands.
 5. Minimum thickness:
 - a. Pipe sizes 2-inch and smaller: 1-inch.
 - b. Pipe sizes 2½-inch to 8-inch: 1½ inches.
 - c. Pipe sizes 10-inch and larger: 2 inches.
- B. Provide saddle spreaders between jacketed pipe insulation and pipe supports.
- C. Acceptable products:
1. Manville Micro-Lok.
 2. Owens-Corning Fiberglass ASJ-SSL-II.
 3. Or equal.

2.2 EXHAUST PIPE INSULATION

- A. Provide exhaust pipe insulation with the following features:
1. Molded high temperature hydrous calcium silicate.
 - a. Thickness: 4 inches minimum.
 - b. Temperature range: to 1,200 degrees F.
 2. Jacketing: 0.016-inch stucco pattern aluminum with stainless steel bands.
 - a. For flanges and fittings: Glass fabric covered with weatherproof mastic finish.
- B. Acceptable products:
1. Manville Thermo-12.
 2. Owens-Corning Kaylo.
 3. Or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install over clean, dry surfaces and in strict accordance with the manufacturer's recommended installation procedures.
- B. Exhaust pipe:
1. Except expansion pieces, apply insulation to exhaust piping, including silencer and all flanges and fittings, to the specified thickness.
 2. Wire first layer of insulation in place. Apply second layer with joints staggered.

END OF SECTION

PIPE INSULATION
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SECTION 23 00 00

HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide heating, ventilating, and air conditioning systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Design drawings, signed by a registered engineer and showing proposed layout of equipment, ducts, registers, grilles, controls, and other components of the system.
 - 2. Calculations demonstrating the adequacy of the proposed systems and its compliance with these Specifications.
 - 3. Manufacturers' catalogs and other items needed to fully demonstrate the quality of the proposed materials and equipment.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.
- E. Comply with pertinent provisions of Section 01 33 01.
- F. Submit Testing, Adjusting and Balancing report specified in Part 3.

1.3 QUALITY ASSURANCE

- A. Without additional cost to the Owner, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

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1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 DUCTWORK

- A. Provide aluminum ducts, except where stainless steel ducts are indicated on the Drawings, fabricated and installed to pertinent ASHRAE and SMACNA standards, or to the requirements of governmental agencies having jurisdiction, whichever requirement is more stringent.
 - 1. Fabricate aluminum duct from 0.032-inch minimum thickness sheets of 3003-H14 alloy.
 - 2. Fabricate stainless duct from 0.019-inch minimum thickness sheets.
- B. Size the ducts for pressure drop of 0.1-inch H₂O per 100 feet unless otherwise indicated on the Drawings.
- C. At branch ducts, provide manually operated dampers two gages heavier than the duct in which installed, and equipped with locking quadrants.

2.2 FLEXIBLE DUCT

- A. Provide factory fabricated insulated low pressure flexible duct with the following attributes:
 - 1. Aluminum inner core with zinc-coated spring steel helix and fiberglass insulation, sheathed in a seamless vapor barrier jacket.
 - 2. Composite assembly, including insulation and vapor barrier, meeting Class 1 requirements of flame spread of 25 or less and smoke developed of 50 or less as set forth in NFPA Bulletin 90-A, and bearing UL label as an air duct.
- B. Provide flexible duct in fully extended condition, free from sags and kinks.
 - 1. Use only the minimum length required to make the connection.
 - 2. Do not exceed 8'-0" in length.
 - 3. Where horizontal support is required, provide at least 3/4-inch wide banding material hangers at not more than 36-inch centers.
 - 4. Make joints and connections with 1/2-inch wide positive locking steel straps.
- C. Acceptable products:
 - 1. Insulated low pressure flexible duct "Type SLC" manufactured by General Flex Corp., or equal.

2.3 DUCT INSULATION

- A. General:
 - 1. Provide materials complying with NFPA Bulletin 90-A, as determined by UL method NFPA 225-ASTM E84, and complying with the governing code, with flame spread rating under 25 and smoke developed rating under 50.
 - 2. Where vapor barriers are used, provide intact and continuous throughout.
- B. Concealed ducts above ceiling and in non-conditioned spaces:
 - 1. Insulate all ducts, including supply, return, and exhaust ducts with 1½-inch thick fiberglass duct wrap blanket with aluminum foil facing.
 - 2. Acceptable manufacturers:
 - a. Manville Microlite Type 75.
 - b. Or equal.

2.4 VENTILATING FANS

- A. General:
 - 1. Provide ventilating fans of the type and capacity as shown on the Drawings.
 - 2. Unless otherwise specified, provide fans for operation on 120 volt, single phase, 60 Hertz alternating current power supply.
 - 3. Provide polarized safety disconnect plug or safety disconnect switch as part of unit, except for propeller type wall exhaust fans.
 - 4. Provide epoxy coating for fans located in the chlorine room.
- B. Side-wall exhaust fans (centrifugal type):
 - 1. Provide exterior mounted, centrifugal type, direct driven, all aluminum construction, and backward curved impeller, complete with bird screen, automatic gravity shutter, and fixed interior grille except duct connection shown on the Drawings.
 - 2. Acceptable manufacturers: Greenheck Series CW, or ACME PDU-WL, or equal.
- C. Utility vent fans:
 - 1. Provide centrifugal type, belt-driven, complete with heavy-duty steel fan housing, and motor-fan mounting bracket for mounting arrangement as shown on the Drawings.
 - 2. Acceptable manufacturers: Penn Dynamo, ACME Centrimaster Model QBR, or equal.

2.5 MOTORIZED DAMPERS

- A. Provide insulated, AMCA-rated, low leakage, extruded aluminum control dampers with parallel blades for 2-position control and the following:
 - 1. Frames: Minimum 0.125-inch thick, 5-inch x 1-inch extruded 6063T5 aluminum channel frames with reinforced corners; thermally broken with dual polyurethane resin filled gaps.

2. Blades: Heavy gage extruded 6063T5 aluminum, airfoil shaped damper blades; each blade internally insulated with polyurethane foam and thermally broken between inner and outer skins.
 3. Blade Axles: Blades shall be secured to 1/2-inch diameter, 304 stainless steel axles and hardware.
 4. Bearings: Non-corrosive dual bearing with molded synthetic inner sleeve and flanged outer bearings.
 5. Linkage: 304 stainless steel blade-to-blade side linkage, out of airstream, concealed in frame.
 6. Control Shafts: For duct mounted applications, provide minimum 6-inch long, 1/2-inch diameter, 304 stainless steel removable control shaft with support bearing on side of damper.
 7. Jackshaft Systems: For multiple section dampers, provide factory installed 1-inch diameter jackshaft systems with support bearings and required linkages.
 8. Crank Arm Systems: For wall louver applications, provide factory installed blade crank arms, controls shafts, and actuators. Provide factory installed linkages and actuator supports suitable for damper installation within wall openings and actuator installation in the damper airstream or adjacent to wall opening with actuator as high as possible above floor and in locations to minimize hazards to building occupants.
 9. Blade Seals: Synthetic resilient jamb seals and blade edge seals.
 10. Leakage Rating: AMCA certified for no greater than 3 cfm/sq.ft. leakage at 1 inwc. pressure differential when tested according to AMCA 500D.
 11. Thermal Performance: Minimum 0.549 (sf-deg F)/Btuh damper assembly thermal resistance rating (R-value), when tested per ASTM C1363/C976.
- B. Acceptable Products: Subject to compliance with requirements, provide one of the following motorized dampers:
1. Greenheck, Model ICD-45.
 2. No exceptions.

2.6 MOTORIZED DAMPER ACTUATORS

- A. Provide UL listed, double insulated, actuators; direct-coupled type, designed for direct mounting to damper control shafts or jackshafts without crank arms or linkages.
1. Torque: Provide actuators in quantities and sizes for running torques sufficient to operate dampers with sufficient reserve power to provide smooth 2-position action.
 2. Motor: Brushless DC motor, monitored and controlled by integrated circuit with rotation sensing to prevent damage or overload due to stall conditions at all angles of rotation.
 3. Housing: Constructed of zinc coated steel, NEMA type 2.
 4. Coupling: V-bolt and V-shaped, toothed cradle suitable for shafts with 1.05-inch diameter or less.
 5. Direction of Rotation: Reversible; clockwise or counterclockwise with visual position indicator.
 6. Manual Override: Manual positioning mechanism accessible on cover.

7. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
 8. Fail-Safe Operation: Mechanical, spring-return mechanism.
 9. Auxiliary Switches: Two UL listed SPDT switches, one fixed and one adjustable.
 10. Power Requirements (Two-Position, Spring Return): 120 VAC, 60 Hz.
 11. Temperature Rating: Minus 22 to plus 122 deg F.
 12. Run Time: 15 seconds maximum on powered stroke, independent of torque; less than 15 seconds spring return.
 13. Acceptable manufacturers: Subject to compliance with requirements, provide damper actuators by one of the following manufacturers:
 - a. Honeywell model MS4120F-1204.
 - b. No exceptions.
- B. Damper Fail-Safe Positions: Provide actuators with the following fail-safe positions on power failure or loss of signal:
1. Unless noted otherwise: Spring Return Closed.
 2. Generator Room Louvers: Spring Return Open.
- C. Hardware: Provide factory-supplied brackets, bearings, control rods, crank arms, ball joints, and any other hardware required for actuator installation and function.

2.7 THERMOSTAT

- A. Provide UL listed, industrial rated thermostat to control the louver and exhaust fan.
1. Interlock to control exhaust fan starter.
 2. Acceptable manufacturers:
 - a. Chromalox WR-80 series.
 - b. Or equal.

2.8 GAS VENTS AND CHIMNEYS

- A. Chimney pipe and fittings:
1. 3-inch through 5-inch size for venting all natural gas fired appliances:
 - a. Provide double wall construction with aluminum inner pipe and galvanized steel outer pipe.
 - b. Acceptable products: Ameri-Vent Type B, or Selkirk Metalbestos Type RV, or equal.
 2. 6-inch through 12-inch for venting natural gas or oil fired appliances:
 - a. Provide insulated double or triple wall construction with stainless steel inner pipe.
 - b. Acceptable products: Ameri-Vent Model FB, or Selkirk Metalbestos Model SS, or equal.
 3. For venting all sewage gas fired units:
 - a. Provide insulating refractory lining encased in aluminized steel jackets.
 - b. Acceptable products: Power-Pac Model PH-2, or Van-Packer Model HT, or equal.

4. For each chimney, provide cleanouts, tees, elbows, roof flashings, storm collars or counterflashings, wall or roof thimbles, bird-proof rain caps, and supporting devices.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

3.2 PREPARATION

- A. Holes in concrete:
 1. Provide sleeves, accurately dimensioned and shaped to permit passage of items of this Section.
 2. Deliver all such sleeves, with accurate setting drawings and setting information, to the trades providing the surfaces through which such items must penetrate, and in a timely manner to assure inclusion in the Work.
- B. Flashing:
 1. Where items of this Section penetrate the roof, outer walls, or waterproofing of any kind, provide under this Section all base flashing and counterflashing required at such penetration.
 2. Provide on each pipe passing through the roof a 3 lb. seamless lead flashing and counterflashing assembly.

3.3 EQUIPMENT INTERFACE

- A. Provide all required shutoff valves, unions, and final connections of piping to the work of this Section.
- B. For electrically operated equipment, verify the electrical characteristics actually available for the work of this Section and provide equipment meeting those characteristics.

3.4 PAINTING

- A. For equipment, provide factory prefinish on all exposed surfaces.
- B. Touch up scratches and abrasions to be invisible to the unaided eye from a distance of 5'-0".

3.5 INSULATION

- A. Wrap insulation firmly around ductwork, covering all surfaces including standing seams, and with all joints lapped at least 2 inches.

- B. Securely fasten the insulation in place with 16 gauge soft annealed black or galvanized wire spaced approximately 12-inch on centers for straight runs and 3-inch on centers for elbows and fittings.
- C. Take special care to avoid excessive stretching and compressing, and to achieve securing at lapped sections where possible.

3.6 INSTRUCTIONS

- A. Upon completion of this portion of the Work, and prior to its acceptance by the Owner, provide a qualified engineer and fully instruct the Owner's maintenance personnel in the proper operation and maintenance of items provided under this Section.
- B. Demonstrate the contents of the approved operation and maintenance manual required under Article 1.2 above.

3.7 TESTING AND ADJUSTING

- A. Test and adjust each piece of equipment and each system as required to assure proper balance and operation.
 - 1. Test and regulate ventilation and air conditioning systems to conform to the air volumes shown on the approved design drawings.
 - 2. Make tests and adjustments in apparatus and ducts for securing the proper volume and face distribution of air for each grille and ceiling outlet.
 - 3. For each system, record the following data in tabulated form:
 - a. Air volumes at all supply, return, and exhaust outlets.
 - b. Total cfm supplied.
 - c. Total cfm returned.
 - d. Total static pressure at each fan and at each system.
 - e. Room pressure in inches of water column for each room
 - f. Motor speed, fan speed, and input ampere rating for each fan.
- B. Submit two sets of test and balance reports to the Engineer for approval.
- C. Eliminate noise and vibration, and assure proper function of all controls, maintenance of temperature, and operation in accordance with the approved design.

END OF SECTION

SECTION 23 85 00
ELECTRIC HEATERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide electric heaters as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Enclosure dimensions, nameplate data, electrical ratings, wiring diagrams, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide electric heaters with indicated performance ratings, styles, and accessories. Provide proper mounting hardware.

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- B. Provide electric heaters listed by UL.

2.2 ELECTRIC UNIT HEATERS

- A. Provide electric unit heaters consisting of casing, heating element, propeller fan, fan motor, controls, and the following:
 1. Configurations: Horizontal or vertical discharge, as indicated.
 2. Louvers: Individually adjustable louver blades.
 - a. Horizontal blades for horizontal discharge units.
 - b. Radial blades for vertical discharge units.
 3. Casings: Steel construction with paint or powder coat finish.
 4. Heating elements: Nickel-chromium resistance wire embedded in compacted dielectric within sealed corrosion resistant steel tubes with fins. Enclose ends of element in terminal box.
 - a. Circuit protection.
 5. Fans: Direct driven resiliently mounted propeller fans with aluminum blades.
 6. Motors: Totally enclosed, rated for continuous duty, same voltage as heating element, with thermal overload protection and permanently lubricated bearings.
 7. Controls:
 - a. High temperature safety switch.
 - b. Fan control with time or temperature based start and stop delay functions.
 - c. Unit-mounted thermostat, contractor, and reduced voltage transformer.
 8. Electrical characteristics: 480 volt, 3 phase, 60 Hz unless indicated otherwise; factory-wired for single point wiring connection in field.
 9. Acceptable products: Provide Chromalox Type KUH, Electromode EU Series, QMark MUH Series, Markel Series 51, or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install electric heaters in accordance with manufacturer's recommendations.
 1. Mount cabinet unit heaters flush in wall or ceiling as shown on Drawings.

3.2 ADJUSTMENT

- A. Adjust and plumb units for proper mounting and installation. Check that air flow is directed properly.
- B. Set thermostat to temperatures as directed by the Owner or Engineer.

END OF SECTION

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide low-voltage electrical power conductors and cables as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Comply with the following standards:
 - 1. UL 83 and ICEA S-61-402 for thermoplastic insulated wire and cable.

2. UL 44, ICEA S-19-81 and ICEA S-66-524 for rubber or rubber-like and cross-linked thermosetting polyethylene insulated wire and cable.

B. Provide copper wire only.

2.2 WIRE AND CABLE IN RACEWAY

- A. Power, light, and control conductors:
 1. Insulation: Rated for 600 volts.
 - a. Use dual rated type THHN/THWN in temperature controlled indoor locations.
 - b. Use Type XHHW in underground locations and unheated concrete structures.
 2. Use stranded wire for control conductors.

2.3 JOINTS, TAPS, SPLICES, AND TERMINATIONS

- A. Conductors No. 10 AWG and smaller: Use twist type insulated wire nut solderless connectors.
- B. Conductors No. 8 AWG and larger: Use solderless compression type connectors of type that will not loosen under vibration or normal strains.
- C. Control and instrumentation conductors: Use crimp type spade connectors where control wires are connected to screw terminals of equipment.
- D. Joints, taps, and splices located in enclosures subject to moisture: Use watertight splice kits.

2.4 PERMANENT WIRE MARKERS

- A. Provide type-on, self-laminating vinyl, heat shrink polyolefin or nylon clip-sleeve, alpha-numeric, permanent wire markers.
 1. Use fine-line, black, permanent ink pens where field marking is necessary.
 2. Cloth tags are not acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wiring system in accordance with manufacturer's recommendations.
- B. Install wire and cable in conduit unless otherwise shown on the Drawings.
- C. Provide individual wiring compartments or barrier for separation between intrinsically safe and non-intrinsically safe conductors inside enclosures.

3.2 WIRE AND CABLE IDENTIFICATION

- A. Install permanent wire markers on wire and cable in junction boxes, pull boxes, wireways, and wiring gutters of panels. Markers to identify wire or cable number.
- B. Provide schedule identifying various power and lighting conductors from power source to equipment or device served.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING OF ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide grounding and bonding as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.
 - 3. Utility company providing electrical service.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Ground clamp fittings, connections, and joints:
 - 1. Provide interlocking listed clamp fabricated from high strength corrosion-resistant metal.
 - 2. Use high strength silicon bronze U-bolt, nuts, and lock washers.
 - 3. Use high strength cast bronze ground rod clamp listed for direct burial for ground rod.
- B. Ground rods:
 - 1. Provide copper or copper-clad steel core.
 - 2. Use 5/8-inch diameter minimum and 10-foot long.
- C. Ground wires:
 - 1. Use copper wire only.
 - 2. Size as shown on the Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Drive ground rod to a depth that allows for physical protection and concealment below finished grade. Leave approximately 4 inches of rod exposed for inspection prior to concealment.
- B. Make connections to ground rods with molded exothermic weld process, or a listed and approved ground rod clamp.

3.2 FIELD QUALITY CONTROL

- A. Perform and record resistance-to-earth measurements witnessed by Engineer with all grounding electrode conductors.
 - 1. Isolate ground under test from other grounds.
 - 2. Measure in normally dry conditions not less than 48 hours after rainfall.
 - 3. Measure at each ground rod and other ground connections when applicable.
- B. Maximum D.C. resistance allowable is 5 ohms.
- C. Use the three-point method of measurement, unless specified otherwise.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide hangers and supports as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide zinc galvanized, cadmium plated steel, or malleable iron supporting devices.

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- B. Provide factory PVC-coated metal supports, clamps, and hardware when PVC-coated, galvanized rigid steel conduit is used.
 - 1. Comply with Section 26 05 33.
- C. Provide PVC supports, clamps and hardware for nonmetallic conduit system.
- D. Provide drilled expansion insert type sleeve anchors, lag shields, or plastic anchors suitable for load and application.

2.2 SUPPORTING STRUCTURES

- A. Provide rack supports of stainless steel channels with adequate feet for secure mounting.

2.3 MOUNTING PANELS

- A. Provide adequately braced and sized equipment mounting panels where required to mount equipment.
- B. Paint surfaces of panel to comply with Section 09 90 00.

2.4 CONDUIT SUPPORTS

- A. Provide continuous or T-slot concrete insert channel.
- B. Provide one-hole or two-hole conduit straps as required.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install supporting devices in accordance with manufacturer's recommendations.
- B. Do not use perforated hanger iron.

END OF SECTION

SECTION 26 05 33

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide raceway and boxes as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide conduit system of the types of conduit as indicated in the Conduit Usage Schedule in Part 3 of this Section.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

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- B. Provide junction boxes as necessary to facilitate pulling and/or splicing of wires.
- C. Provide factory PVC-coated boxes of same coating thickness as conduit system where PVC-coated conduit is used (except hazardous classified areas).
- D. Provide PVC boxes where non-metallic conduit system is used.

2.2 METAL RACEWAY AND FITTINGS

- A. Galvanized rigid steel conduit (GRC) and fittings:
 - 1. Conduit: Comply with ANSI C80.1 and UL 6 standards.
 - 2. Fittings: Comply with UL 514B and NEMA FB1 & FB2.10 standards.
- B. Intermediate metal conduit (IMC) and fittings:
 - 1. Conduit: Comply with ANSI C80.6 and UL 1242 standards.
 - 2. Fittings: Comply with UL 514B and NEMA FB1 & FB2.10 standards.
- C. Electrical metallic tubing (EMT) and fittings:
 - 1. Conduit: Comply with ANSI C80.3 and UL 797 standards.
 - 2. Fittings: Comply with UL 514B and NEMA FB1 & FB2.10 standards.
- D. Polyvinyl-chloride (PVC) coated galvanized rigid steel conduit and fittings.
 - 1. Conduit: Comply with ANSI C80.1, UL 6, and NEMA RN1 standards.
 - a. Galvanized rigid steel conduit with full weight 40 mil thick PVC exterior coating.
 - b. PVC bonding to galvanized metal shall be stronger than plastic tensile strength.
 - c. Provide nominal 2 mil thick urethane, or equal, coating to inside of conduit.
 - 2. Fittings:
 - a. Comply with UL 514B and NEMA RM1 standards.
 - b. Threaded with full weight 40 mil thick PVC exterior coating.
 - c. Inside coating: Nominal 2 mil thick urethane, or equal.
 - d. Provide pressure sealing sleeves on all conduit openings.
 - 3. Accessories: Provide straps, clamps, and screws with full weight 40 mil thick PVC exterior coating.
 - 4. Provide factory-installed PVC coating on all components of PVC coated conduit system.
 - a. Use coating in field only for touch-up of components.
- E. Rigid aluminum conduit and fittings:
 - 1. Conduit: Comply with ANSI C80.5 and UL 6 standards.
 - 2. Fittings: Threaded, and in compliance with Comply with UL 514B and NEMA FB1 standards.

2.3 FLEXIBLE METAL RACEWAY AND FITTINGS

- A. Liquidtight, flexible metal conduit and fittings:
 - 1. Conduit: Comply with UL 360 standards.
 - a. Galvanized flexible steel core.

- b. Provide outer liquidtight, PVC sunlight resistant jacket.
- 2. Fittings: Comply with UL 514B and NEMA FB1 standards.

- B. Flexible metal conduit and fittings:
 - 1. Conduit: Comply with UL 1 standards.
 - 2. Fittings: Comply with UL 514B and NEMA FB1 standards.

2.4 NON-METALLIC RACEWAY AND FITTINGS

- A. Rigid conduit: Comply with ANSI C80.3, ASTM F512, NEMA TC-2 and UL 651 standards.
 - 1. Use heavy wall, sunlight resistant, PVC Schedule 40 or 80 as shown on the Drawings.
 - 2. Rated for use with 90 degree C. conductors.
- B. Liquid tight, flexible conduit: Comply with ANSI-79 and UL 1660 standards.
 - 1. Fittings: Liquid-tight.
- C. Fittings:
 - 1. Comply with UL 514C and NEMA TC3 standards.
 - 2. Schedule 40 or 80 to match conduit.

2.5 CONDUIT BODIES

- A. Metallic conduit bodies:
 - 1. Comply with ANSI C80.4 and C33.84, and UL 514 standards.
 - a. Use galvanized or cadmium plated malleable iron, or copper-free aluminum material.
 - b. Provide factory PVC-coated conduit bodies of same coating thickness as conduit where PVC-coated conduit is used.
- B. Non-metallic conduit bodies:
 - 1. Comply with ASTM F512 and UL 514 and 651 standards.
 - a. Compatible with Schedule 40 or 80 conduit.
 - b. UL listed for use.
- C. Provide removable cover with gasket and corrosion-resistant screws.

2.6 EXPANSION FITTINGS

- A. Expansion fittings: Comply with UL 514 standards.
 - 1. Provide copper grounding strap and clamps.
 - 2. Use Crouse-Hinds Type XJ, or equal.
- B. Expansion/deflection fitting:
 - 1. Comply with UL 514 and 467 standards.
 - 2. Use Crouse-Hinds Type XD, or equal.

- C. Provide factory PVC-coated fittings of same coating thickness as conduit where PVC-coated conduit is used.
- D. For non-metallic conduit system, use expansion fittings of material to match conduit installed.

2.7 OUTLET BOXES AND JUNCTION BOXES

- A. Flush mounted: Provide galvanized steel boxes and accessories suitable for application and type construction.
- B. Surface mounted: Provide corrosion-resistant single or multiple gang malleable iron or aluminum Type FS or FD cast boxes with threaded hubs, or pressed steel boxes as permitted under Part 3 of this Section.
- C. Weatherproof boxes: Provide gasketed covers and corrosion-proof fasteners.

2.8 PULL BOXES AND SPECIAL PURPOSE OUTLET BOXES

- A. Provide pull boxes with covers held in place by corrosion-resistant machine screws, and of type or NEMA rating as shown on the Drawings.
- B. Provide special purpose outlet boxes furnished with fixtures and devices where standard outlets are not applicable.

PART 3 - EXECUTION

3.1 INSTALLATION - RACEWAY

- A. Install conduit and fittings in accordance with manufacturer's recommendations.
- B. Run exposed conduits parallel to or at right angles with lines of building or structure.
- C. Route conduit runs above suspended panel ceilings so as not to interfere with panel removals.
- D. Keep conduit plugged, clean and dry during construction.
- E. Install wall sleeves as shown on the Drawings where conduits pass through foundation walls below grade.
- F. Install expansion fittings in the following locations:
 - 1. Conduit runs crossing structural expansion joint.
 - 2. Conduit runs attached to two separate structures.
 - 3. Conduit runs where movement perpendicular to axis of conduit may be encountered.

- G. Conduit runs extending through areas of different temperature or atmospheric conditions, or partly indoors and partly outdoors must be sealed, drained, and installed in a manner preventing drainage of condensed or entrapped moisture into cabinets, boxes, fixtures, motors, or equipment enclosures.
- H. Conduits run in concrete structures:
 - 1. Comply with applicable provisions of ACI 318 for conduits embedded in structural frame slab.
 - 2. Install conduits parallel to each other spaced on center of at least three times conduit trade diameter with minimum 2-inch concrete covering.
 - 3. Conduits over 1-1/2 inches may not be installed in slab without approval of Engineer.
- I. Install bushings with ground lugs and integral plastic linings at equipment with open-bottom conduit entrances.
- J. In precast areas, run conduits in roof insulation space. Use 3/4-inch maximum conduit size.
- K. Exterior underground conduit:
 - 1. Provide conduits or ducts terminating below grade with means to prevent entry of dirt or moisture.

3.2 INSTALLATION – BOXES

- A. Install boxes in accordance with manufacturer's recommendations.
- B. Use weatherproof boxes for interior and exterior locations exposed to weather or moisture.
- C. Do not install boxes back to back or through wall. Off set outlet boxes on opposite sides of wall minimum 12 inches.
- D. Set outlet boxes parallel to construction.
- E. Thoroughly clean boxes prior to installing wiring devices.

3.3 CUTTING AND PATCHING

- A. Make provisions for openings, holes, and clearances through walls, floors, ceilings, and partitions in advance of construction.
- B. Cut and patch in accordance with Section 01 73 29.
- C. Core drill through reinforced concrete with approval of Engineer.

3.4 RESTRICTIONS

- A. Cross high temperature piping or ducts with 12-inch clearance.

- B. Do not route conduit over boiler, incinerator, or other high temperature equipment, piping, or ducts.
- C. Do not route exposed conduit below and parallel to, or adjacent to water piping.
- D. Do not use EMT indenter-type fittings on EMT conduit.

3.5 EXISTING CONDUIT

- A. The Drawings show the approximate location of existing conduit as indicated by available existing records. The proposed work may require crossing, relocating, and, in some cases, connecting to the existing conduits.
- B. Expose carefully the existing conduits throughout the area of proposed work.
 - 1. All existing conduits to remain undisturbed and in uninterrupted use until such time as a change is approved by the Engineer.
- C. Where the conduits are to cross or be connected to existing conduit, make a field check to determine whether any conflict will be encountered in laying the new conduit.
 - 1. Adjust the location of new conduits, if necessary, as authorized by the Engineer, to avoid conflict with existing conduits.
- D. Where new conduits are to connect to existing conduits, provide all fittings required to complete the connection, and do the work as expeditiously and carefully as possible.
 - 1. Inspect and clean existing conduit prior to installing new wire.
- E. Remove and replace existing conduits, fittings, boxes, and all appurtenances as shown on the Drawings.
 - 1. Do not remove and replace existing items shown to remain unless approved by the Engineer.

3.6 CONDUIT USAGE SCHEDULE

- A. Install GRC when in contact with earth or fill unless otherwise shown on the Drawings.
- B. Install GRC or IMC in the following locations unless otherwise shown on the Drawings:
 - 1. Concealed in poured concrete walls and floor or roof slabs.
 - 2. Concealed in insulation above poured or precast concrete roof slabs.
 - 3. Exposed.
- C. EMT conduit may be installed in the following locations unless otherwise shown on the Drawings:
 - 1. Above suspended ceilings.
 - 2. In attic spaces.

3. Concealed in walls, hollow metal or wood framed floors, ceilings, soffits, and overhangs.
 4. Concealed by counter base cabinets.
 5. Inside exterior electrical enclosures.
- D. Install liquidtight flexible metal conduit and fittings for connections to motors, instrumentation, and equipment subject to vibration and at locations shown on the Drawings.
- E. Install PVC coated galvanized rigid steel conduit, rigid aluminum conduit, and rigid non-metallic conduit only when shown on the Drawings.

3.7 EXPOSED OUTLET AND JUNCTION BOXES

- A. Use cast boxes up to 45 inches above floor.
- B. Pressed steel boxes acceptable over 45 inches above floor in dry, indoor locations.
- C. Install weatherproof outlet, switch, and junction boxes outdoors and in any area where Drawings show weatherproof (WP) wiring devices.

3.8 OUTLET BOX ACCESSORIES

- A. Provide outlet box accessories and mounting devices as required for each installation.

3.9 OUTLET BOX LOCATIONS

- A. Location of outlets and equipment is approximate. Exact location to be verified and determined by:
1. Conflict with equipment of other trades.
 2. Equipment manufacturer's drawings.
 3. Engineer in field.
- B. Minor modification in location of outlets and equipment is considered incidental up to distance of 10 feet with no additional compensation, providing necessary instructions are given prior to roughing-in of outlet boxes and equipment.
- C. Nominal mounting heights for devices and equipment to be measured from either above finished floor (AFF) or above finished grade (AFG) to center line of device and, unless otherwise shown on the Drawings.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide identification for electrical systems as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 NAMEPLATES AND TAGS

- A. Provide nameplates or tags for identification of panels, panel components, and field mounted devices with the following requirements.
 - 1. Engraved laminated plastic.

2. White or black letters on background of opposite color. Match and coordinate color of nameplate or tag background with other panels.
- B. Panel nameplates to have 1/2-inch high letter engraving.
- C. Device and component nameplates or tags to have 3/16-inch high letter engraving.
- D. Engravings include the following:
 1. Alpha-numeric number.
 2. Descriptive title.
 3. Range, where applicable.
 4. Engineering units, where applicable.

2.2 ARC FLASH WARNING LABELS

- A. Provide Arc Flash warning stickers as required by NEC Article 110.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install nameplates and tags on enclosures, panel mounted components, and field mounted devices.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide wiring devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide wiring devices in type and electrical rating for service indicated.

- B. See symbol schedule on Drawings for identification of device type.
- C. Acceptable manufacturers:
 - 1. Hubbell.
 - 2. Leviton.
 - 3. Or equal.

2.2 SWITCHES

- A. General use lighting switches:
 - 1. Comply with UL 20, NEMA WD-1, and Federal Specification W-S-896 standards.
 - 2. Provide industrial grade, 20 ampere, toggle type switches.

2.3 RECEPTACLES

- A. Comply with UL 498, NEMA WD-1 & WD-6, and Federal Specification W-C-596 standards.
- B. General use single and duplex, 125 volt receptacles:
 - 1. Provide industrial grade, NEMA 5-20R grounding type receptacles rated at 20 amperes.
- C. General use single or duplex 250 volt receptacles:
 - 1. Provide industrial grade, NEMA 6-20R, grounding type receptacles rated at 20 amperes, or as indicated.
- D. Combination duplex receptacles:
 - 1. Provide industrial grade, grounding type receptacles rated at 20 amperes, consisting of one 120 volt and one 250 volt receptacle.
- E. Ground fault circuit interrupter receptacles:
 - 1. Comply with UL 943 Class A standard.
 - 2. Provide industrial grade, GFCI duplex receptacles rated at 20 amperes, 120 volts.
 - 3. Provide construction as follows:
 - a. Shallow depth and NEMA 5-20R configuration.
 - b. Feed-through feature.

2.4 WIRING DEVICE PLATES AND COVER

- A. Comply with UL 514D.
- B. Provide wall plates for wiring devices with mounting screws colored to match plate finish.
- C. Plates of interior flush mounted devices: Provide high impact thermoplastic polycarbonate, nylon or stainless steel.

- D. Device plates for surface mounted Type FS or FD boxes: Provide type FSK galvanized steel covers.
- E. Device plates for surface mounted, 4-inch square boxes: Provide 1/2-inch raised galvanized steel covers.
- F. Weatherproof (WP) plates and covers: Provide with gasketed, lift cover.
 - 1. Provide lift cover designed to be fully closed when plug for dedicated equipment is inserted in receptacle.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wiring devices in accordance with manufacturer's recommendations.
- B. Install gasket plates for devices or system components having light emitting features, such as switch with pilot light.
- C. Install devices at height as specified in Section 26 05 33 or as shown on the Drawings.
- D. Do not use combination type switch/switch or switch/receptacle devices.
 - 1. Provide separate box gang for each switch and receptacle.
- E. Thoroughly clean box interiors from construction dust, debris, etc. prior to installing wiring devices.

3.2 FIELD QUALITY CONTROL

- A. Provide operational testing for devices.
- B. Test receptacles for correct polarity, proper ground connection, and wiring faults.

END OF SECTION

SECTION 26 28 00

LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide overcurrent protective devices as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Electrical ratings, physical size, interrupt ratings, trip curves, I²t curves, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – Provide the following spare parts to the Owner that match items specified:
 - 1. In three phase circuits: Three (3) fuses of each type and rating.
 - 2. In single phase circuits: Two (2) fuses of each type and rating.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.
 - 3. Provide overcurrent protective devices by same manufacturer for each type of device.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

LOW-VOLTAGE CIRCUIT PROTECTIVE DEVICES

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1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 FUSES

- A. General purpose fuses for protection of motors, transformers, feeders, and main service:
 - 1. Use UL Class RK-1 fuses:
 - a. Single end rejection or to fit mountings specified.
 - b. 0-600 ampere rating.
 - c. 200,000 ampere interrupting capacity.
 - d. Dual element, time delay.
 - e. Use Bussman Low Peak FRN-R, or equal: 250 volt rating.

2.2 MOLDED CASE CIRCUIT BREAKERS

- A. General:
 - 1. Comply with UL 489 requirements.
 - 2. Provide thermal and magnetic protection.
- B. Provide permanent trip lighting panel circuit breakers as follows:
 - 1. UL listed SWD (switching duty) on 120 volt circuits where switched circuits are indicated.
 - 2. Short circuit rating (integrated equipment rating):
 - a. Up to 240 volt: 10,000 RMS symmetrical amps minimum.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install overcurrent protective devices in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide enclosed switches and circuit breakers as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Electrical ratings, physical dimensions, NEMA rating, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide disconnect with the following ratings:
 - 1. 240 volt or 600 volt AC as required by circuit voltage.

2. Ampere value as shown on Drawings.
3. UL listed short circuit rating of 200,000 RMS amps with Class R fuses where a fused disconnect is indicated.
 - a. Comply with Section 26 28 00.

2.2 SAFETY SWITCH

- A. Provide NEMA heavy-duty, quick-make and quick-break type:
 1. Cover interlock mechanism with handle attached to box.
 - a. Handle position indication of ON in up position and OFF in down position.
 2. Padlock provision in the ON and OFF positions.
 3. Provisions for insulated or bonded neutral.
 4. Provision for control circuit interlock.

2.3 ENCLOSED CIRCUIT BREAKER

- A. Provide molded case circuit breakers:
 1. Comply with Section 26 28 00.
 2. Cover interlock.
 3. Handle position that indicates ON, OFF, or TRIPPED.
 4. Padlock provision in the OFF position.
 5. External trip indication.
 6. Provision for insulated or bonded neutral.
 7. Provision for control circuit interlock.

2.4 ENCLOSURES

- A. Indoor: Provide NEMA 1 steel construction.
- B. Outdoor area: Provide NEMA 3R or NEMA 4 steel construction.
- C. Corrosive area: Provide NEMA 4X stainless steel construction.

2.5 NAMEPLATES

- A. Provide engraved laminated plastic type.
- B. Use 3/16-inch high white or black letters on background of opposite color.
- C. Identify disconnect means as follows:
 1. Disconnect: For purpose of switch or equipment controlled.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install enclosed switches and circuit breakers in accordance with manufacturer's recommendations.

END OF SECTION

ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 28 16-2 (160194.40)

SECTION 26 32 13.33

DIESEL FUELED ENGINE-GENERATORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide diesel fueled engine-generators as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Submit shop drawings in compliance with pertinent provisions of Section 01 33 01.
 - 2. Engine-generator set, exhaust system, cooling system, control panel, auxiliary equipment, controls, and manufacturer's detailed specifications.
- B. If Contractor selects equipment other than Caterpillar, submit details of the required changes.
 - 1. Drawings are based on Caterpillar equipment.
 - 2. If Contractor selects other equipment manufacturer, changes will be required to the design that is shown on the Drawings.
 - 3. Make the required changes by re-designing structural system and ancillary systems such as louvers, controls, code required clearances, fuel piping capacity, electrical feeds to generator heater, vent piping systems, and supports that result from the use of a manufacturer other than Caterpillar.
 - 4. No reduction in system process flexibility or maintenance accessibility is acceptable.
 - 5. Changes will be evaluated in accordance with the requirements for substitute items of major equipment and materials as specified in Section 01 62 01 and the General Conditions.
 - 6. All costs associated with the required changes shall be borne by the Contractor, as delineated in the General Conditions for substitute items.
- C. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- D. Certificates and Guarantees – None Required.

DIESEL FUELED ENGINE-GENERATORS

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- E. Spare Parts – None Required.
- F. Lubricants – First fill of oil and antifreeze.
- G. Test reports:
 - 1. Submit certified test reports of prototype and production tests.
 - 2. Submit field test reports on engine-generator start-up.
- H. Permits:
 - 1. Generator manufacturer is to provide all required EPA emissions certification.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70, National Electrical Code (NEC).
 - 2. NFPA 110, Emergency and Standby Power Systems.
 - 3. UL 2200.
 - 4. Local codes and ordinances.
 - 5. Conduct factory prototype tests.
 - 6. Conduct factory production tests simulating the field load conditions and verify proper operation of all components prior to shipping equipment.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE

- A. Include in the price of the Diesel Generator a 5-year (60 month) complete maintenance package. To include but, not limited, a semi-annual Level One and annual Level Two with oil change based on the manufacture interval program. Provide documentation in the equipment submittals. Also provide Level One and Level Two cut sheets and line itemed on the proposals.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide engine-generator set and factory authorized service and support from a manufacturer who shall warranty the complete engine-generator package with accessories as described herein.
 - 1. Third party and/or individual warranties for components and accessories of the engine-generator package do not meet this requirement of the specifications.

- B. Provide engine-generator set with direct 1:1 mechanical connection from engine output shaft to alternator shaft:
 - 1. Engine-generator sets that employ gear reduction between the engine and the alternator do not meet this requirement of the specifications.
- C. Acceptable manufacturer:
 - 1. **Countryside Station**: Caterpillar, 400 KW diesel generator, Engine: C13, Generator Frame: LC6134D, 105 deg C rise oversized.
 - a. No substitutions.
 - 2. **President Street Station**: Caterpillar, 600 KW diesel generator, Engine: C18, Generator Frame: LC7034J, 105 deg C rise oversized.
 - a. No substitutions.

2.2 ENGINE-GENERATOR RATINGS

- A. **Countryside Station**: Provide standby engine-generator set for emergency duty having the following minimum ratings:
 - 1. Standby rating: 400 KW; 500 KVA.
 - 2. Power factor: 0.8.
 - 3. Frequency: 60 Hertz.
 - 4. Starting KVA at 25 percent transient voltage dip: 1018 SKVA.
 - 5. Output voltage: 480 VAC.
 - 6. Three phase, 3 - wire, delta connected.
 - 7. Rating based upon operating conditions at 1,000-foot elevation and 38 degree C ambient temperature.
- B. **President Street Station**: Provide standby engine-generator set for emergency duty having the following minimum ratings:
 - 1. Standby rating: 600 KW; 750 KVA.
 - 2. Power factor: 0.8.
 - 3. Frequency: 60 Hertz.
 - 4. Starting KVA at 25 percent transient voltage dip: 1550 SKVA.
 - 5. Output voltage: 480 VAC.
 - 6. Three phase, 3 wire, delta connected.
 - 7. Rating based upon operating conditions at 1,000-foot elevation and 38 degree C ambient temperature.
- C. Provide regulator system suitably filtered and capable of regulating the generator output to permit the starting of and running of connected loads as shown on the Drawings, simultaneously with a maximum of 25 percent transient voltage dip with return to steady state in less than 2 seconds. Steady state is defined as operation with terminal voltage remaining constant within $\pm 1/2$ of 1 percent of rated voltage.

2.3 ENGINE CONSTRUCTION

- A. Provide heavy duty industrial type, liquid-cooled, four-cycle compression ignition engine.
- B. Operates on No. 2 diesel fuel. Engines requiring premium fuels will not be accepted.

2.4 ENGINE ACCESSORY EQUIPMENT

- A. Provide the following engine accessories in addition to manufacturer's standard equipment for each system required:
1. Isochronous electronic governor: Control engine speed to maintain a frequency regulation not exceeding ± 0.25 percent from no load to full rated load.
 2. Oil drain extension through side of skid base to outside of generator enclosure.
 3. Heavy duty air cleaner.
 4. Fuel priming pump or self-priming fuel pump per manufacturer's standard.
 5. Fuel/water separator.
 6. Lubricating oil cooler.
 7. Overcrank cut-out.
 8. Overspeed cut-out.
 9. Low oil pressure cut-out.
 10. High coolant temperature cut-out.
 11. Battery charging alternator.
 12. Flexible fuel connections.
 13. **Countryside:** Engine coolant heater with shut-off valves, 6000 watt, 480 volt, single phase with adjustable thermostat.
 14. **President Street:** Engine coolant heater with shut-off valves, 9000 watt, 480 volt, single phase with adjustable thermostat.
 15. Manufacturer's standard vibration isolators located between engine-generator and skid base.

2.5 STARTING BATTERIES AND CHARGER

- A. Provide starting batteries:
1. Sufficient number of heavy duty 12 volt DC lead acid type batteries as recommended by the generator set manufacturer.
 2. Stranded copper battery cables and clamps.
 3. Acid resistant metal battery rack.
 4. Locate batteries and rack near engine starter.
- B. Provide automatic battery charger:
1. Transistor controlled battery charger for continuous taper charging.
 2. Two charge ranges, float and equalize at manufacturer recommended voltage.
 3. 10 Amp.
 4. Automatic surge suppressors.
 5. DC ammeter and voltmeter.
 6. Fused AC input and DC output.
 7. Housing: Manufacturer's standard enclosure for wall mounting.
 8. Operate on input voltage of 120 VAC.
 9. Charger malfunction and low battery voltage alarms.

2.6 COOLING EQUIPMENT

- A. Unit mounted radiator:
 1. Engine driven blower type fan sized to maintain safe operation at 122 degrees F maximum ambient temperature.
 2. Duct adapter flange with ductwork and flexible connection section between radiator and discharge louver frame.
 3. Total air flow restriction across the radiator not to exceed 0.5 inches W.C.
 4. Sized for 50 percent ethylene-glycol solution at 40 degrees C ambient and 1,000 feet elevation.
- B. Ethylene-glycol antifreeze with rust-inhibitor to -50 degrees C.

2.7 EXHAUST EQUIPMENT

- A. Silencer:
 1. Countryside: Provide hospital grade silencer (pancake style) G T Exhaust Systems Inc. # 401-6108.
 2. President Street: Provide super critical grade silencer (regular tube style) GTE # 201-6110.
 3. Provide inlet and outlet flanges conforming to American Standard 125-150 pound drilling, along with gaskets for sizes 4-inch diameter and larger.
 4. Mount so that weight is not supported by engine.
- B. Piping:
 1. Comply with requirements of Section 22 19 13.
 2. Sized to insure that exhaust backpressure does not exceed the maximum limitations specified by the generator set manufacturer.
 3. Provide condensate drain tap, connecting nipple, and drain valve with operating handle.
 4. Provide stainless steel flexible connector.
 5. Provide suitable rain cap.
- C. Insulation:
 1. Comply with requirements of Section 22 19 33.
 2. Provide insulation for piping, fittings, and silencer, except expansion pieces, such that surface temperatures do not exceed 150 degrees F.

2.8 GENERATOR CONSTRUCTION

- A. Provide three phase, 60 Hertz, single bearing, synchronous type generator of drip-proof construction with the following requirements:
 1. Extended stack as required to compensate for effects of non-linear loads (variable frequency motor controllers).
 2. Reconnectable broadrange wiring.
 3. Radio suppression meeting commercial standards.
 4. Constructed to NEMA, IEEE, and ANSI standards.

5. Class H insulation for both stator and rotor.
 - a. Protect both stator and rotor windings with 100 percent epoxy impregnation to reduce possible fungus and/or abrasion deterioration.
6. Voltage regulation: ± 0.5 percent steady state within 40 degree ambient temperature change from no load to full load.
7. Provide readily accessible voltage droop, voltage level and voltage gain adjustments (minimum of ± 5 percent).
8. Permanent magnet generator.
9. Provide short-circuit current sustaining device to enable the generator to sustain 300 percent of rated current for a period of up to 10 seconds.
10. Provide molded-case, 3-pole circuit breaker as follows:
 - a. **Countryside:** 800 Amp, 3 Pole, 80% rated.
 - b. **President Street:** Rating as indicated on plans.
 - c. Located on generator unit.
 - d. Includes lugs for line and load connections.
 - e. Includes an isolated neutral and a copper ground bus.
 - f. Complies with Section 26 28 00.

2.9 ENGINE/GENERATOR CONTROLLER

- A. General:
 1. Digital, open protocol, microprocessor based system.
 2. True RMS sensing, 0.5% metering.
 3. Programmable protective relaying with alarm set-points for under-voltage, over-voltage, under-frequency, over-frequency, over-current, and reverse power.
 4. Programmable load demand relay.
 5. User-friendly, quick access, keypad programming.
- B. Construction:
 1. IP22, dust proof cabinet designed to withstand 20 G shock (22 G @ 18-500 Hz.).
 2. Processor and associated alarm components sealed in die-cast aluminum housings.
 3. Control panel and components to meet E.M.I. Immunity IEC 801-2, IEC 801-3, IEC 801-4, and EN 5082-2.
 4. UL 508A listed.
- C. Generator mounted electronic modular control panel to include:
 1. Standard generator control and monitoring:
 - a. Digital ammeter, voltmeter, and frequency meter (0.5% accuracy).
 - b. Ammeter/voltmeter phase selector switch.
 - c. Voltage adjust rheostat.
 2. Standard engine controls and monitoring:
 - a. Automatic/manual start-stop control.
 - b. Engine control switch for off/reset, auto start, manual start.
 - c. Cycle cranking.
 - d. Cool-down timer.

- e. Emergency stop pushbutton.
- 3. Safety shutdown protection and LED indicators for:
 - a. Low oil pressure.
 - b. High coolant temperature.
 - c. Over-crank.
 - d. Over-speed.
 - e. Emergency stop pushbutton.
 - f. Spare.
- 4. Digital display for:
 - a. Coolant temperature.
 - b. Oil pressure.
 - c. Service hours.
 - d. Engine RPM.
 - e. System DC volts.
 - f. System diagnostic codes.
- 5. Three (3) dry contact sets wired to terminal strip as follows:
 - a. One normally open set to indicate engine failure (closes when engine-generator fails to run).
 - b. One normally closed set for motorized damper (opens when engine-generator is running).
 - c. One normally open set for running status (closes when engine-generator is running).
- 6. Digital Communications:
 - a. RS485 Modbus RTU output.
 - b. Minimum 6 programmable input points that convert in the digital stream.

2.10 DAY TANK

- A. A heavy gauge, steel, 100-gallon day tank, epoxy coated inside, rust-proofed and finish painted outside, in ASA No. 61 grey, removable top cover, fuel level gauge, 1/3 horsepower, 120 VAC, 1 phase, 60 hertz, thermally protected motor with 2 GPM duplex pump system high-lift gear pump, tank drain, five 1" NPT threaded pipe connections plus fuel inlet and 4-1/2" square inspection port. Also includes an Electrical control module (ECM) containing heavy-duty float switch, Press-to-test switch, pump running indicator light and terminal strip.
 - 1. Rupture basin.
 - 2. Low, High, leak alarms.
 - 3. 7 gpm reverse acting pump.
 - 4. UL 508.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install engine-generator package on concrete pad in accordance with manufacturer's recommendations.
 - 1. Anchor unit to concrete foundation with masonry anchors.

2. Provide diesel fuel required for start-up.
 3. Provide full tank of diesel fuel upon satisfactory completion of start-up and testing.
- B. Fill batteries and connect cables with suitable lugs.
- C. Mount battery charger where shown on the Drawings and connect to batteries per manufacturer's recommendations.
- D. Install exhaust system piping in accordance with Section 22 19 13.
1. Provide with drip pocket and drain valve.
 2. Size pipe as recommended by the engine manufacturer.
 3. Equip outlet with rainguard and stainless steel bird screen.
 4. Install silencer in accordance with manufacturer's recommendations.
 5. Insulate silencer and piping in compliance with Section 22 19 33.
- E. Install fuel supply piping in accordance with Section 22 19 13.

3.2 ENGINE-GENERATOR START-UP

- A. After all engine-generator equipment has been installed, provide a portable load bank test using the services of a manufacturer's representative to perform the following:
1. Connect the engine-generator set to the load bank and conduct a continuous 4-hour load test which varies the load on the generator from 10 percent to 100 percent to determine that the voltage, frequency, capacity, fuel, combustion air, cooling, and ventilation systems are adequate.
 - a. Apply 10 percent load for 15 minutes, 25 percent load for 15 minutes, 50 percent load for 15 minutes, 75 percent load for 15 minutes, and 100 percent load for 3 hours.
 - b. Apply each load increment in single steps.
 - c. Observe and record the following parameters at 15 minute intervals throughout the test: voltage, frequency, amperes, oil pressure, coolant temperature, and battery charge rate (record battery charge rate at 5 minute intervals for the first 15 minutes, then at 15 minute intervals thereafter).
 2. Perform an automatic transfer switch test in accordance with NFPA 110.
 - a. Provide a comprehensive demonstration to Owner of the system maintenance and operation after the load bank test.
 3. Perform sound level readings during the three-hour period when the engine-generator is undergoing load bank testing at 100 percent load.
 - a. Use properly calibrated test instrument.
 - b. Measure sound levels at 23 feet (7 meters) from front, sides and rear surfaces of generator set enclosure.

END OF SECTION

SECTION 26 36 00
TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide transfer switches as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this section include, but are not limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Electrical ratings, wiring schematics, single-line diagrams, NEMA rating, and manufacturer's detailed specifications.
- B. Operation and Maintenance Manuals – Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – Provide the following spare parts that match items furnished with the transfer switches:
 - 1. Three (3) fuses of each type and rating.
 - 2. Six (6) pilot light lamps of each type and rating.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electric Code (NEC).
 - 2. NFPA 110 Emergency and Standby Power Systems.
 - 3. UL 1008.
 - 4. NEMA ICS10-1993 Automatic Transfer Switches.
 - 5. Local codes and ordinances.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

TRANSFER SWITCHES
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1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Rating:
 - 1. 480Y/277 volts, 3 phase, 4 wire, 60 Hertz.
 - 2. Continuous current rating as shown on the Drawings.
 - 3. Minimum 1,200 RMS symmetrical amperes short circuit current.
- B. Provide automatic transfer switches with the following requirements:
 - 1. Double throw contact configuration with mechanical and electrical interlocks to prevent load circuits from being connected to normal and emergency power sources simultaneously.
 - 2. Industrial type pilot devices, relays, and time delays.
 - 3. Front accessibility for ease of maintenance.
 - 4. Programmable neutral switch position for motor load decay with the following requirements:
 - a. Transfer time adjustable from 0-30 seconds.
 - b. Time delay occurs for both transfer directions.
 - c. Mechanical interlock to prevent both sets of contacts from being closed at the same time.
 - 5. Undervoltage sensing (phase to ground) for each phase of normal source as follows:
 - a. Pick-up voltage adjustable from 85 to 100 percent of nominal (set at 95 percent).
 - b. Drop-out voltage adjustable from 75 to 98 percent of nominal (set at 85 percent).
 - 6. Frequency and voltage sensing devices to prevent transfer to the emergency source until the engine-generator has reached its rated frequency and voltage as follows:
 - a. Voltage adjustable from 85 to 100 percent of nominal (set at 90 percent).
 - b. Frequency adjustable from 90 to 100 percent of nominal (set at 95 percent).
 - 7. Time delay for override of normal source voltage sensing adjustable from 1 to 6 seconds (set at 1 second) to delay transfer and engine start signals.
 - 8. Time delay for retransfer to normal source adjustable from 0 to 30 minutes (set at 10 minutes) beginning when normal source voltage has been restored to 95 percent of rated voltage on all three phases.
 - 9. Test switch to simulate a normal source failure.
 - 10. Position indicator lights to indicate which source is connected to the load.
 - 11. Source available indicating lights controlled by normal and emergency source sensing circuits.
 - a. Normal Source Available: green light with engraved nameplate.

- b. Emergency Source Available: red light with engraved nameplate.
- 12. Unassigned auxiliary switch position contacts: normally open, single pole, double throw, rated 10A at 240Vac/32Vdc.
- 13. Engine start contacts: one normally closed, one normally open rated 10A at 32 Vdc.
- 14. Engine shutdown contacts time delay adjustable from 0 to 10 minutes (set at 5 minutes) after retransfer to normal source.
- 15. Engine generator exerciser: solid state, programmable time switch as follows:
 - a. Exercise cycle selectable for weekly, bi-weekly, or calendar schedule and time of day.
 - b. Exercise period adjustable with automatic retransfer to normal source at end of period.
 - c. Integral battery operation of exerciser when normal control power is not available.
- C. Provide enclosure as follows:
 - 1. Indoor: NEMA 1 rating.
 - 2. Outdoor: NEMA 4 rating.

2.2 CONTACTOR TYPE AUTOMATIC TRANSFER SWITCH

- A. Provide a mechanically held, contactor type automatic transfer switch as follows:
 - 1. Operated by momentarily energized mechanism.
 - 2. Includes means for manual operation.
- B. Acceptable manufacturers:
 - 1. ASCO Power Technologies.
 - 2. G.E. Industrial/Zenith.
 - 3. Russelectric Inc.
 - 4. Or equal.

2.3 MANUAL TRANSFER SWITCH

- A. Provide non-fusible double throw safety switch:
 - 1. Cover interlock mechanism with handle attached to box.
 - 2. Field installed grounding kit.
 - 3. Identify switch positions on exterior of switch.
- B. Provide engraved laminated plastic nameplate with 3/16" high white or black letters on background of opposite color.
 - 1. Identify "Normal" and "Emergency" positions.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install transfer switches in accordance with manufacturer's recommendations.

3.2 FIELD QUALITY CONTROL

- A. Provide the services of a factory authorized service representative to inspect, test, and adjust the automatic transfer switches to verify proper operation.

3.3 DEMONSTRATION

- A. Provide training on adjustment, operation and maintenance of the automatic transfer switches.
- B. Coordinate training with that for the engine generator equipment.

END OF SECTION

SECTION 26 51 13

INTERIOR LIGHTING FIXTURES, LAMPS, AND BALLASTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide interior lighting fixtures, lamps, and ballasts as shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals:
 - 1. Photometric data, and manufacturer's detailed specifications.
 - a. Provide fixture shop drawings in booklet form with index and a separate sheet for each fixture, assembled in luminaire "type" alphabetical order, with specified fixture and accessories clearly indicated on each sheet.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Comply with the following requirements:
 - 1. NFPA 70 National Electrical Code (NEC).
 - 2. Local codes and ordinances.
- B. Fixtures as specified in lighting fixture schedule establish standard of quality for project as determined by Engineer.
- C. Equivalency of fixtures will be determined by Engineer based upon the following criteria:
 - 1. Efficiency.
 - 2. Photometric data (Efficacy, Distribution).
 - 3. Appearance.

INTERIOR LIGHTING FIXTURES, LAMPS, AND BALLASTS

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4. Construction.
5. Design compatibility.

D. Provide fixtures that bear UL label and manufacturer's name.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide lighting fixtures of type, size, and rating shown in lighting fixture schedule, complete with, but not necessarily limited to, lamps, lamp holders, ballast, reflectors, starters, wiring, and any other details required for a complete working installation.
- B. Verify ceiling system compatibility with recessed fixture mounting before placing order.
- C. Provide proper trim for each fixture as required for various types of ceiling; plaster rings, fixture ends or caps, suspension units, mounting brackets, and/or other auxiliary parts necessary to make complete fixture.

2.2 LIGHT EMITTING DIODE (LED) FIXTURES

- A. The luminaire shall be constructed as detailed in the plans and will be completely solid state with no moving parts or cooling fans and will meet and exceed the following National Standards and Recommended Global Lighting Safety Publications.
 1. The Illuminating Engineering Society of North America (IESNA) new Backlight, Uplight, Glare or BUG standards of measurement provides improved performance descriptions and measurements for outdoor LED luminaires. The TM-15 Luminaire Classification System (ICS) for Outdoor Luminaires classifies luminaire photometric performance related to light trespass, sky glow and high angle brightness control.
 2. All Solid State Lighting (SSL) should meet the requirements of accepted safety standards through the independent testing of Nationally Recognized Testing Laboratory (NRTL).
 3. The manufacturer shall be an Energy Star Partner and Department of Energy SSL Quality Advocate and be committed to upholding program standards through testing and reporting.
 4. All products and components shall meet safety certifications through Underwriters Laboratories.

- B. LED attributes and design advantages shall include:
 - 1. Environmentally Friendly (no mercury and no lead).
 - 2. Optional Color Temperatures (a minimum range of 3000K, 4000K and 5000K).
 - 3. Low maintenance and disposal costs.
 - 4. Compatible with Photovoltaic and Lighting Control Systems and Components.
- C. The complete luminaire assembly shall be designed to operate the LED optical assembly for a minimum of 50,000 hours in a 25 degree C environment and longer if the ambient temperatures are less. The manufacturer shall warranty the product for 5 years after shipment to the jobsite and will maintain a sales and service organization to support the product. All LED lighting manufacturers must have at least a 5-year history of manufacturing and supplying LED products.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install interior lighting fixtures, lamps, and ballasts in accordance with manufacturer's recommendations.
- B. Verify pendant lengths and placement of outlets and surface-mounted fixtures to maintain alignment, spacings, layout, and general arrangement as shown on the Drawings.
 - 1. Contractor may vary dimensions slightly to clear obstructions.
 - 2. Any major changes in arrangement must be approved by Engineer.
- C. Coordinate with other trades so lighting fixtures are properly aligned with items such as diffusers, grilles, and piping.
 - 1. If necessary, relocate fixtures as directed by Engineer to avoid conflict with other equipment.
- D. Install wires in pendants and seal all fixture pendants to prevent moisture from entering fixture.
- E. Use black self-adhesive polyfoam gasketing around inside edges of frame where necessary to ensure light-tight joints between recessed fixtures and ceiling.

3.2 FIXTURE SUPPORTS

- A. Fixture support items and retaining clips: Comply with Section 26 05 29.

3.3 ADJUSTMENT

- A. Adjust and plumb fixtures for proper installation.
- B. Align adjustable fixtures to satisfaction of Engineer.

3.4 FIELD QUALITY CONTROL

- A. At time of Substantial Completion, replace lamps in lighting fixtures observed to be noticeably dimmed after Contractor's use and testing, as judged by Engineer.

END OF SECTION

SECTION 31 16 00
SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes clearing and grubbing the site as shown on the Drawings and specified in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide materials, not specifically described but required for proper completion of the work of this Section, as selected by the Contractor subject to the approval of the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PROTECTION

- A. Protect existing utilities indicated or made known.
- B. Protect trees and shrubs, where indicated to remain, by plank wrappers securely wired in place or by providing a fence around the tree or shrub of sufficient distance away and of sufficient height so trees and shrubs will not be damaged in any way as part of this Work.
 - 1. Do not permit any equipment to operate within 5 feet of any trees or shrubs that are to remain or in a manner as to harm overhanging branches.
- C. Protection of persons and property:
 - 1. Barricade open depressions and holes occurring as part of this Work, and post warning lights on property adjacent to or with public access.
 - 2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 - 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by operations under this Section.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to the site at all times.

3.3 CLEARING

- A. Tree removal:
 - 1. Cut off trees and stumps at the existing ground level. Remove stumps and roots as needed.

2. Remove trees and stumps within 2 feet of the proposed structures and underground piping to a depth of not less than 12 inches below the base elevation of proposed structures or underground piping.

3.4 CONSERVATION OF TOPSOIL

- A. After the area has been cleared of vegetation, strip the existing topsoil in areas shown on the Drawings to be seeded or planted, and to fill planters, without contamination with subsoils.
- B. Stockpile in an area clear of new construction.
- C. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.
 1. Maintain stockpile free from debris and trash.
 2. Keep the topsoil damp to prevent dust and drying out.
 3. Provide silt fences around perimeters of all stockpiles.
 4. Provide temporary seeding of stockpiles.
 5. Comply with erosion and sediment control requirements of these specifications and all permitting agencies.

3.5 DISPOSAL

- A. General:
 1. Remove and dispose of all debris from clearing and demolition work.
 2. Dispose away from the site in a legal manner.
 3. Do not store or accumulate debris at the job site.
- B. Do not burn debris at the site.

3.6 UTILITIES

- A. Coordinate with utility companies and agencies as required.
- B. Where utility cutting, capping, or plugging is required, pay utility company to do the work, or perform such work in accordance with requirements of the utility company or governmental agency having jurisdiction.

END OF SECTION

SECTION 31 22 22

EARTHWORK FOR ROADS, DRIVEWAYS, AND WALKS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes earthwork, including clearing, tree removal, hedge removal, excavation, embankment, compaction, and subgrade preparation for constructing roads, driveways, and sidewalks as shown on the Drawings, as specified herein, and as needed for a complete installation.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work in a timely manner.
- C. Comply with requirements of governmental agencies having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 (As specified in Part 3)

PART 3 - EXECUTION

3.1 GENERAL CONSTRUCTION REQUIREMENTS

- A. Strip topsoil and stockpile for use with final grading.
- B. Construct to the lines and grades as shown on the Drawings.
- C. Use excess excavated materials for embankment in areas as shown on the Drawings and as directed by the Engineer.

3.2 CLEARING, TREE REMOVAL, AND HEDGE REMOVAL

- A. Description:
 - 1. These items consist of the removal and disposal of all obstructions, such as fences, walls, foundations, buildings, accumulations of rubbish of whatever nature and existing structures, logs, shrubs, brush, and other vegetation; the cutting, grubbing, removal and disposal of all trees and stumps.
- B. Perform these items of work within the right of way, of excavation, and as directed by the Engineer in accordance with Section 201 of the IDOT "Standard Specifications".

3.3 ROADWAY EXCAVATION

- A. Description:
 - 1. Roadway excavation consists of excavation, removal and satisfactory disposal of all materials including pavement, taken from within the right of way for the construction of embankments, subgrade, sub-base, shoulders, intersections, ditches, waterways, and incidental work.
 - 2. Roadway excavation does not include excavation for structures, or rock excavation.
- B. Perform roadway excavation in accordance with Section 202 of the IDOT "Standard Specifications".
 - 1. Terminate excavation with a full depth sawcut and provide a smooth vertical surface between the existing to be removed and the existing to remain as directed by the Engineer.

3.4 EMBANKMENT

- A. Description:
 - 1. This work consists of the construction of embankments by depositing, placing and compacting earth, stone, gravel, or other materials of acceptable quality above the existing grade.

- B. Comply with applicable articles of Section 205 of the IDOT "Standard Specifications".

3.5 BORROW

- A. Description:

- 1. This work consists of obtaining embankment material from locations furnished by the Contractor or from borrow pits furnished by the Owner. It includes excavating, transporting, and placing the material for the construction of embankments, subgrade, shoulders, sub-base, intersections, approaches, entrances, and other parts of the project as shown on the Drawings and directed by the Engineer.

- B. Comply with applicable articles of Section 204 of the IDOT "Standard Specifications".

3.6 SUBGRADE

- A. Description:

- 1. This work consists of preparing the subgrade including shaping and final compaction of the earth for the construction of sub-base, base, and surface course.

- B. Comply with applicable articles of Section 301 of the IDOT "Standard Specifications".

- C. Proof-roll the prepared subgrade for structural acceptance before pavement construction:

- 1. Provide 45,000-pound load on a rubber-tired, single-unit truck.
 - 2. Drive slowly over area to be inspected.
 - 3. Repair areas which show depressions or deflections greater than 1-inch deep.
 - a. Remove and dispose unsuitable material from failed area no more than 2 feet below proposed subgrade unless otherwise directed by Engineer.
 - b. Backfill excavation with material meeting the approval of Engineer or with gradation CA 1 as specified in Section 1004 of the IDOT "Standard Specifications".
 - 4. Repeat proof-roll and/or repair until approved by the Engineer.

END OF SECTION

SECTION 31 23 39

EXCAVATING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Excavate, backfill, compact, and grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. Comply with requirements of governmental agencies having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with pertinent provisions of Section 01 66 11.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 FILL AND EXCAVATED BACKFILL MATERIALS

- A. Provide excavated backfill materials free from organic matter, rubble, or frozen material, containing no rocks or lumps over 6 inches, and with not more than 15 percent of the rocks or lumps larger than 2 inches.
- B. Fill material is subject to the approval of the Engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soils free from organic matter and other foreign matter.
- C. Do not permit rocks having a dimension greater than 1-inch in the upper 12 inches of fill or embankment.

2.2 TOPSOIL

- A. Topsoil is specified under Section 32 92 00.16 of these Specifications.
- B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from sources outside the project limits, or from both sources.

2.3 STRUCTURAL BACKFILL MATERIAL

- A. Provide well graded, 100 percent crushed gravel or crushed stone aggregate free of clay, loam, dirt, calcareous or other foreign matter, conforming to the IDOT "Standard Specifications" gradation No. CA 6 with the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
1.500-inch	100%
1.000-inch	90-100%
0.500-inch	60-90%
No. 4	30-56%
No. 16	10-40%
No. 200	4-12%

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 GENERAL CONSTRUCTION REQUIREMENTS

- A. Protection of existing facilities, persons, and property:
 - 1. Unless shown to be removed, protect existing structures, conduits, active utility lines and all other facilities shown on the Drawings or otherwise made known to the Contractor. If damaged, repair or replace to a condition equal to or better than the original condition at no additional cost to the Owner.
 - 2. Notify all persons, firms, corporations, or agencies owning or using any existing structures, conduits, or utilities which may be affected by the Work prior to the start of construction.
 - 3. Make arrangements to locate, maintain, protect, and/or relocate facilities to complete the Work.
 - 4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
 - 5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.
 - 6. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
 - 7. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 - 8. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.
- B. Dewatering:
 - 1. Remove all water, including stormwater runoff, encountered during trench and sub-structure work to an approved location by pumps, drains, and other approved methods.
 - 2. Keep excavations and site construction area free from water.
 - a. Whenever during construction operations any loose material is deposited in the flow line of drainage structures or ditches such that the natural flow line of water is obstructed, remove this loose material at the close of each working day. At the conclusion of construction operations, keep all drainage structures and flow lines free from dirt and debris.
- C. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- D. Maintain access to adjacent areas at all times.

3.3 EXCAVATING

- A. Perform excavating of every type of material encountered within the limits of the Work to the lines, grades, and elevations indicated and specified herein.

- B. Unsatisfactory excavated materials:
 - 1. Excavate to a distance below grade as directed by the Engineer, and replace with satisfactory materials.
 - 2. Include excavation of unsatisfactory materials, and replacement by satisfactory materials, as parts of the work of this Section.
- C. Surplus materials:
 - 1. Dispose of unsatisfactory excavated material, and surplus satisfactory excavated material, away from the site at disposal areas arranged and paid for by the Contractor.
- D. Topsoil materials:
 - 1. Strip and stockpile topsoil materials from areas to be excavated and regraded for use in final grading.
- E. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.
- F. Unauthorized excavation:
 - 1. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific instruction from the Engineer.
 - 2. Under footings or foundations:
 - a. Fill unauthorized excavations by extending the indicated bottom elevation of the footing or base to the excavation bottom, without altering the required top elevation.
 - b. When acceptable to the Engineer, lean concrete fill may be used to bring the bottom elevation to proper position.
 - 3. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations, unless otherwise directed by the Engineer.
- G. Stability of excavations:
 - 1. Slope sides of excavations to 1:1 or flatter, unless otherwise directed by the Engineer.
 - 2. Shore and brace where sloping is not possible because of space restrictions or stability of the materials being excavated.
 - 3. Maintain sides and slopes of excavations in a safe condition until completion of backfilling.
- H. Sheet piling and bracing:
 - 1. Design, provide, and install sheet piling and bracing as may be necessary for safety of personnel, protection of work, and compliance with requirements of governmental agencies having jurisdiction.
 - 2. Maintain sheet piling and bracing in excavations regardless of the time period excavations will be open.
 - 3. Remove sheet piling and bracing after the excavation has been backfilled to an elevation which will prevent caving of exposed sidebanks.
 - 4. Fill voids left by the withdrawal of sheet piling with compacted sand.

5. Leave sheeting and bracing in place whenever necessary to protect adjacent facilities or property.

I. Excavating for structures:

1. Conform to elevations and dimensions shown within a tolerance of 0.10 ft., and extending a sufficient distance from footings and foundations to permit placing and removing concrete formwork, installation of services, other construction required, and for inspection.
2. In excavating for footings and foundations, take care not to disturb bottom of excavation:
 - a. Excavate by hand tools to final grade just before concrete is placed.
 - b. Trim bottoms to required lines and grades to leave solid base to receive concrete.
3. Excavate for footings and foundations only after general site excavating, filling, and grading are complete.
4. Allowable net soil bearing pressure: 2,500 psf minimum unless otherwise required on the Drawings.
 - a. Provide equipment and services of an independent geotechnical testing laboratory to determine allowable net soil bearing pressure complying with pertinent provisions of Section 01 45 29.
 - b. Include cost of the testing in the total amount of the contract price for excavating, backfilling, and compacting work.
 - c. Check every 500 square feet with minimum of two (2) tests per foundation or as directed by the Engineer.

J. Excavating for pavements:

1. Cut surface under pavements to comply with cross-sections, elevations, and grades.

K. Cold weather protection:

1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F.

3.4 FILLING AND BACKFILLING

A. General:

1. For each classification listed below, place acceptable soil material in layers to required subgrade elevations.
2. In excavations:
 - a. Use satisfactory excavated backfill or borrow fill materials.
3. Under concrete or bituminous pavements:
 - a. Use suitable subbase materials.
4. Under slabs, footings, conduits and other structures and facilities:
 - a. Use structural backfill material.

B. Backfill excavations as promptly as progress of the Work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing and waterproofing.
2. Inspecting, testing, approving, and recording locations of underground utilities.

EXCAVATING, BACKFILLING, AND COMPACTING

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3. Removing shoring and bracing, and backfilling of voids with satisfactory materials.
 4. Removing trash and debris.
- C. Ground surface preparation:
1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious matter from ground surface prior to placement of fills.
 2. Plow, strip, or break up sloped surfaces steeper than one vertical to four horizontal so that fill material will bond with existing surface.
 3. When existing ground surface has a density less than that specified under "compacting" for the particular area, break up the ground surface, pulverize, moisture condition to the optimum moisture content, and compact to required depth and percentage of maximum density.
- D. Placing and compacting:
1. Place excavated backfill and fill materials in layers not more than 12 inches in loose depth.
 2. Place structural backfill material in layers not more than 6 inches in loose depth.
 3. Compact each layer to the required density for the area.
 4. Do not place backfill or fill material on surfaces that are muddy, frozen, or containing frost or ice.
 5. Place backfill and fill materials evenly adjacent to structures, to required elevations.
 6. Take care to prevent wedging action of backfill against structures by carrying the material uniformly around the structure to approximately the same elevation in each lift.
 7. Compact each layer of structural backfill material with vibratory rollers, pneumatic tampers, or other compacting equipment approved by the Engineer.

3.5 GRADING

- A. General:
1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
 2. Smooth the finished surfaces within specified tolerance.
 3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
- B. Grading around structures:
1. Grade areas adjacent to structures to achieve drainage away from the structures, and to prevent ponding.
 2. Finish the surfaces to be free from irregular surface changes, and:
 - a. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft. above or below the required subgrade elevation.

3.6 COMPACTING REQUIREMENTS

- A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D1557 or AASHTO T-180.
 - 1. Provide equipment and services of an independent geotechnical testing laboratory for density tests complying with pertinent provisions of Section 01 45 29.
 - 2. Include the cost of the testing in the total amount of the contract price for excavating, backfilling, and compacting work.
 - 3. Test density of each lift of compacted backfill and fill placed.
- B. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place, and as approved by the Engineer.
 - 1. Structures:
 - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 95 percent of maximum density.
 - 2. Lawn and unpaved areas:
 - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 85 percent of maximum density.
 - b. Compact the upper 12 inches of filled areas, or natural soils exposed by excavating, at 85 percent of maximum density.
 - 3. Pavements:
 - a. Compact the top 8 inches of subgrade and each layer of fill material or backfill material at 90 percent of maximum density.
- C. Moisture control:
 - 1. Where subgrade or layer of soil material must be moisture-conditioned before compacting, uniformly apply water to surface of subgrade or layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
 - 2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
 - 3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing.

3.7 MAINTENANCE

- A. Protection of newly graded areas:
 - 1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds.
 - 2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

SECTION 32 92 00.16

LAWNS AND GRASSES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide topsoil, seeding, and care of grass during establishment period for a complete surface restoration of lawns, and other areas disturbed as a result of the construction.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.
- C. References:
 - 1. Reserved.

1.2 SUBMITTALS

- A. Shop Drawing Submittals – None Required.
- B. Operation and Maintenance Manuals – None Required.
- C. Certificates and Guarantees – None Required.
- D. Spare Parts – None Required.

1.3 QUALITY ASSURANCE – Reserved.

1.4 DELIVERY, STORAGE, AND HANDLING – Reserved.

1.5 SITE CONDITIONS – Reserved.

1.6 MAINTENANCE – Reserved.

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. Provide a mixture of black dirt having at least 90 percent passing a No. 10 sieve, free of large roots, brush, sticks, weeds, and stones larger than 1/4-inch in diameter, and any other debris.

2.2 AGRICULTURAL LIMESTONE

- A. Provide agricultural-grade ground limestone, ground sufficiently fine so that at least 80 percent will pass through a No. 8 sieve, containing not less than 80 percent calcium carbonate equivalent. Moisture content at time of delivery not exceeding 8 percent.

2.3 FERTILIZER

- A. Provide commercial grade fertilizer, having nutrient content of 16 percent nitrogen, 6 percent phosphorus, and 24 percent soluble potash.

2.4 EROSION CONTROL MATERIALS

- A. Excelsior blanket:
 - 1. Provide excelsior blanket consisting of a machine produced mat of wood excelsior of 80 percent 6 inches or longer fiber length.
 - 2. Provide cover with a 60-day photodegradable extruded plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting having an approximate minimum opening of 5/8" x 5/8" to maximum opening of 2" x 2".
 - 3. Comply with the following:
 Minimum width: 24 inches.
 Minimum weight: 0.9 lbs./sq.yd.
 Minimum length of roll: 150 feet.
- B. Knitted straw mat:
 - 1. Provide knitted straw mat consisting of machine assembled blanket of clean, weed-free straw from agricultural crops, approximately 1/2-inch loose thickness.
 - 2. Cover the top side of the blanket with a photodegradable plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting of 3/8" x 3/8" square openings adhered to the straw by a knitting photodegradable or biodegradable thread.
 - 3. Supply the blanket in a protected rolled mat form of 6'-6" width and the dry weight not less than 0.70 pounds per square yard.
- C. Straw/coconut fiber mat:
 - 1. Machine-assembled blanket of clean, weed-free 70 percent straw from agricultural crops and 30 percent coconut fiber, of approximately 1/4-inch thickness.
 - 2. Cover the top side of the mat with a photodegradable plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting with 3/8-inch by 3/8-inch square openings.
 - a. Attach mesh to the mat with photodegradable or biodegradable knitting thread.
 - 3. Supply blanket in protected rolled mat form of 6'-6" width, with a dry weight of 0.50 pounds per square yard minimum.

4. Acceptable products:
 - a. SC150BN by North American Green.
 - b. Or equal.

D. Coconut fiber blanket:

1. Machine-assembled mat of 100 percent coconut fiber, of approximately 1/4-inch thickness.
2. Cover the top side of the mat with a photodegradable plastic (polypropylene) or biodegradable natural (jute fiber) mesh netting with 3/8-inch by 3/8-inch square openings.
 - a. Attach mesh to the mat with photodegradable or biodegradable knitting thread.
3. Supply blanket in protected rolled mat form of 6'-6" width, with a dry weight of 0.50 pounds per square yard minimum.
4. Acceptable products:
 - a. C125BN by North American Green.
 - b. Or equal.

- E. Provide 6-inch long staples of 11 gauge wire to hold mat or blanket in place.

2.5 MULCH

A. Vegetative mulch:

1. Provide vegetative mulch for seeded areas of a high-quality, air-dried straw of wheat, rye, oats, beans, or other approved straw, free from grass, broom sedge, noxious weeds, and weed seeds detrimental to growth of grass.

B. Hydraulic mulch:

1. Provide virgin wood cellulose fibers complying with the following properties (percent by weight):

Moisture content	15
Organic matter, minimum	95
Water holding capacity	400
pH	4.3-8.5

2.6 SEED

- A. Provide new crop seed furnished in standard sealed containers bearing seed tags showing purity, germination, and weed seed content, free of all primary noxious weed seeds and seeds of other noxious weeds as stipulated in the IDOT Standard Specifications, complying with the following minimum requirements:

<u>Seed Type</u>	<u>Purity</u>	<u>Pure Live Seed</u>
Kentucky Bluegrass	97%	80%
Red Top	90%	78%
Creeping Red Fescue	97%	82%
Tall Fescue	98%	83%
Annual Ryegrass	97%	85%
Perennial Ryegrass	97%	85%

- | | | |
|--------------|-----|-----|
| Oats | 92% | 88% |
| Winter Wheat | 92% | 89% |
- B. In level areas to be used for lawns, use the following seed mixture:
- | | |
|---------------------|-----------------|
| <u>Seed Type</u> | <u>Lbs/Acre</u> |
| Kentucky Bluegrass | 100 |
| Perennial Ryegrass | 60 |
| Creeping Red Fescue | 40 |
- C. In level and sloped areas where reduced mowing will occur, use the following seed mixture:
- | | |
|---------------------|-----------------|
| <u>Seed Type</u> | <u>Lbs/Acre</u> |
| Tall Fescue | 100 |
| Perennial Ryegrass | 50 |
| Creeping Red Fescue | 40 |
| Red Top | 10 |
| Annual Ryegrass | 15 |
- D. For temporary erosion control seeding, use 130 lbs/acre of oats between March 1 and July 31 or 130 lbs/acre of winter wheat between August 1 to November 15.

PART 3 - EXECUTION

3.1 TOPSOIL PLACEMENT

- A. Scarify the compacted subgrade to a depth of 3 inches to receive the topsoil.
- B. Spread at least 4 inches of prepared topsoil in areas of new grading raked smooth and level.
- C. Grade flush with walks, curbs, and paving.

3.2 PREPARATION FOR SEEDING

- A. Do not start preparation until all other site and utility work and finished grading within the areas to be seeded have been completed.
- B. Till topsoil to a depth of at least 3 inches and smooth out all surface irregularities resulting therefrom. Leave area free of rocks or hard soil clods which will not pass through the tines of a standard garden rake.
- C. Take a test of the site soils to determine the need for application of agricultural limestone (soil pH less than 7.0). If agricultural limestone is needed, then at least 7 days before applying fertilizer, spread lime uniformly in sufficient quantity to produce in the soil a pH of 7.0. Work lime thoroughly into topsoil to a depth of 3 inches.

- D. Apply fertilizer uniformly at a rate of 7 lbs. per 1,000 sq.ft. Work fertilizer into soil prior to seeding.

3.3 SEEDING

- A. Seed all grassed areas disturbed by construction operations and as indicated on the Drawings.
- B. Sow seed between September 1 and November 1, or in spring from time ground can be worked until June 1.
- C. Apply seed during favorable climatic conditions. Do not seed in windy weather or when soil is very wet. Sow seed at the rate specified for each seed mixture.
- D. Broadcasting seeding method:
 - 1. Sow seed with mechanical seeder in two directions at right angles to each other to achieve an even distribution of seed.
 - 2. After seeding, rake seed lightly into ground and roll with a roller weighing between 100 and 200 pounds per foot of roller width.
- E. Hydraulic seeding method:
 - 1. When seed is applied with a hydraulic seeder, apply at a rate of not less than 1,000 gallons of slurry per acre containing the proper quantity of seed specified above.
 - 2. When using a hydraulic seeder, apply the fertilizer in a separate operation.

3.4 TEMPORARY EROSION CONTROL SEEDING

- A. Seed all erodible/bare areas with a temporary cover crop within 7 days of disturbance, unless the area is to have an alternative temporary or permanent soil erosion control measure implemented within 7 days of disturbance, or as directed by Engineer.
- B. Seed bed preparation will not be required if the soil is in a loose conditions. Light disking shall be done if the soil is hard packed or caked. Fertilizer will not be required.

3.5 EROSION CONTROL MATTING OR FABRIC

- A. Immediately after rolling seeded areas, place erosion control excelsior blanket or fiber mat on slopes steeper than 4 horizontal to 1 vertical. Unless otherwise indicated, also place erosion control material at sides and bottoms of ditches, swales, and all areas within 10 feet of catch basins in seeded areas.
- B. Apply erosion control in accordance with the IDOT "Standard Specifications".

3.6 MULCHING SEEDED AREAS

- A. Immediately after rolling seeded areas, apply mulch at the rate of 2 tons per acre within 24 hours after seeding. Use vegetative mulch on all seeded areas unless hydraulic seeding method is used.
- B. If the hydraulic mulch application method is to be used, apply the hydraulic mulch at a rate of 2,000 pounds per acre.
- C. Apply mulch in accordance with the IDOT Standard Specifications.

3.7 WATERING

- A. Immediately after placing mulch, water seeded areas thoroughly with a fine mist spray. Keep soil thoroughly moist until seeds have sprouted and achieved a growth of 1-inch.

3.8 PROTECTION OF WORK

- A. Protect newly seeded areas from all traffic by erecting temporary fences and signs. Protect slopes from erosion. Properly and promptly repair all damaged work when required.

3.9 APPLICATION OF FERTILIZER

- A. Six weeks after completion of seeding apply granular fertilizer over all areas at the rate of 2 lbs. of nitrogen nutrients per 1,000 sq.ft. of area.

3.10 CLEAN-UP

- A. At the time of final inspection of work, but before final acceptance, remove from seeded areas all debris, rubbish, excess materials, tools, and equipment.

3.11 MAINTENANCE

- A. Provide watering, mowing, and replanting and continue as necessary until a close healthy stand of specified grasses is established.
- B. Replace lawns not showing a close uniform stand of healthy specified grasses at the end of the guaranty period and maintain until acceptance.

END OF SECTION

SECTION 33 57 11

UNDERGROUND FUEL STORAGE TANKS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide and install underground fuel storage tanks with piping systems, controls systems, monitoring devices, dispensing systems, special equipment, painting of items as specified, systems testing, openings and appurtenances as indicated on the Drawings and as specified.
- B. Related work:
 - 1. Documents affecting work under this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Division 01 - General Requirements of these Specifications.

1.2 SUBMITTALS

- A. Submit shop drawings in compliance with pertinent provisions of Section 01 33 01, including equipment dimension drawings.
- B. Submit operation and maintenance manuals in compliance with pertinent provisions of Section 01 78 26.

PART 2 - PRODUCTS

2.1 FUEL STORAGE TANK

- A. Primary tank shall be totally contained within an approved secondary containment system, which has standoffs as part of its construction, affording a free-flowing 360-degree annular space with a monitoring well. The primary tank shall be vented.
- B. Tanks shall furnish the nominal capacities and outside dimensions as indicated on the Drawings. Tanks shall be furnished with fitting locations, model, sizes, and location of manways as indicated on the Drawings. The bung configuration shall be as indicated on the Drawings.
- C. The minimum thickness of the primary and secondary tanks shall be seven gauges for 2,000-gallon capacity and 1/4-inch for up to 12,000-gallon capacity. Tanks shall be of welded construction.
- D. Tanks shall be furnished with the capability of storing diesel fuel at ambient temperatures, or fuel oil at temperatures not exceeding 150 degrees F. Tanks shall be capable of storing liquids up to specific gravity of 1.1.

UNDERGROUND FUEL STORAGE TANKS

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- E. The primary tank shall be constructed of mild steel plate and the secondary tank of mild steel with fiberglass cladding. Holiday tests of 35,000 volts shall be performed over tank surfaces at the factory to assure there are no pinholes or hairline cracks.
- F. When the tank is buried as a unit, it shall be able to withstand H-20 axle loads applied at ground surface.
- G. Tanks shall be designed to support necessary equipment and accessories as detailed in the Drawings.
- H. A UL brass tag with tank registration number, name of tank manufacturer, year of fabrication, capacity in gallons and type of product stored shall be affixed to the tank in addition to the normal tag.
- I. Threaded fittings shall have machine tolerances with the ANSI standard for each fitting size. NPT fittings shall withstand a minimum of 150 foot-pounds of torque and 1,000 foot-pounds of bending, both with a 2:1 factor of safety. Fittings shall be retaped after welding.
- J. Lifting lugs shall be provided on the tanks and shall have a safety factor of 2:1.

2.2 UNDERGROUND FUEL STORAGE TANKS

- A. The tanks shall be as manufactured by:
 - 1. XERXES CORPORATION, 7901 Xerxes Avenue South, Minneapolis, MN 55431, 952.887.1890.
 - 2. Or equal.
- B. Tank Construction:
 - 1. Tanks shall be double wall fiberglass reinforced plastic (FRP) meeting the requirements of UL 1316 and Mil-Spec MIL-T-T-52777 and shall be constructed of 100% premium resin and glass reinforcements with no sand fillers. Structural ribs shall be integrally cast with the wall, not secondarily bonded on. No pigmentation of resin and glass reinforcements. Metallic fittings, manways, striker plates and lift lugs to be fabricated by tank manufacturer to insure quality control.
 - 2. Tanks shall be capable of supporting:
 - a. The external hydrostatic pressure of an empty tank buried in the ground with 7 feet of overburden or hole fully flooded with a safety factor of 7:1 against general buckling.
 - b. Tanks to have U.L. approval for 7-foot bury depth and UL approval for deep burial with Xerxes engineering approval for site specific burial conditions.
 - c. Factory test of 11.5" mercury vacuum to be performed on every tank to verify structural integrity. Document verifying this procedure to accompany submittals.
 - d. Surface H-20 axle loads when properly installed to manufacturer's current installation instructions.

UNDERGROUND FUEL STORAGE TANKS

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- e. A 5 psi air pressure test applied to the primary and secondary tanks with 5:1 safety factor.
 - f. Post cure consisting of forced hot air preformed on all tanks.
 - g. If deadmen are required, deadmen shall be engineered and thirty (30) day cured by tank manufacturer.
- 3. DWT II tanks shall be capable of storing EPA-approved fuels at ambient temperatures, limited to gasoline, gasohol, ethanol or ethanol/gasoline blends, MTBE additive with gasoline, jet fuel, AV-gas, kerosene, diesel fuel, motor oil with or without tank water bottoms or fuel oil at temperatures not to exceed 150 degrees F. Tanks U.L.-listed to store up to, and including, 100% Alcohol Products.
- C. Diesel Tank:
 - 1. Tank shall be double wall 2,000-gallon nominal capacity, six feet in diameter and 13 feet, 6 inches in length.
 - 2. Double wall tanks shall have (1) 22-inch diameter manway. Manway shall have min. (3) 4-inch NPT fittings in manway cover and tank shall have (4) 4-inch shell wall fittings. Fittings in manway shall be for supply (turbine), automatic tank gauge and extra. Shell wall fittings shall be for fill/manual gauge, vent/vapor and extra.
 - 3. Tank shall have (1) 42-inch diameter x 6-inch high factory installed secondary containment collar surrounding manway.
 - 4. Tank shall have (1) 42-inch diameter x 12-inch high (can be field cut to accommodate exact burial depth), FRP ACR containment risers with water tight lid.
 - 5. Tank sump to be fiberglass and shall have bulkhead fittings that test the integrity of sump wall. Fittings supplied by tank manufacturer or others.
 - 6. All service fittings shall have 12-inch x 12-inch gauge/deflector plates under them on bottom of tank.
 - 7. Tanks shall have (1) 4-inch NPT monitor fitting penetrating outer wall only of tank.
 - 8. Double wall tanks shall have integrally mounted FRP reservoir to accommodate factory-brine-filled interstitial for continuous leak detection.

2.3 UNDERGROUND PIPING SYSTEMS

- A. Piping system to be manufactured by:
 - 1. Ameron International, Houston, TX 77280, 713.690.7777.
 - 2. Or equal.
- B. Product Piping System Description:
 - 1. Piping shall be rigid coaxial fiberglass designed for buried petroleum service and sized for test pressure of 300 psig at up to 150 degrees F. The pipe shall have an internal epoxy liner and a reinforced epoxy exterior coating. The wall shall be composite glass fiber laminates. All components shall be UL 971 listed for below grade petroleum product piping and shall conform to ASTM D2310 & D2996, & standard classification RTRP-11CX and ASTM 02996 specification designation RTRP-11CX5430. Both primary and

- secondary piping shall be compatible with all known fuels including ethanol blends up to 100% ethanol and bio-diesel.
2. Primary piping shall be adhesive bonded taper/taper joint. Adhesive shall be a two part amino cured epoxy. Adhesive to be all alcohol fuels (100% methanol and ethanol) compatible. The actual composition and preparation shall be in accordance with the manufacturer's recommendations. Adhesive to be Ameron PSX 20. Primary fittings shall be UL listed and shall be compatible with up to 100% methanol and ethanol and all known alcohol blends.
 3. Secondary containment fittings shall be U.L Listed, molded clamshell fittings to accommodate LCX coaxial pipe.
 4. Fiberglass coaxial piping shall be U. L. Listed Ameron Dualoy 3000 /LCX.
 5. Secondary containment shall be achieved through use of coaxial fiberglass piping and clamshell fittings that are bonded with a two part epoxy adhesive. Secondary containment piping & fittings shall be UL listed and shall be tested at a minimum of 30 P.S.I.

2.4 LEAK DETECTION SYSTEM FOR UNDERGROUND TANKS & PIPING

- A. The leak detection system shall be as manufactured by:
 1. OMNTEC/ELECTRO LEVELS, 1993 Pond Avenue, Ronkonkoma, New York 11779, 516.9812001.
 2. Or equal.

2.5 TANK GAUGING, LEAK MONITORING AND OVERFILL PREVENTION

- A. Tank Gauging Monitor:
 1. Provide and install one common remote tank gauging and leak detection system for all tanks that can simultaneously monitor product levels, water levels, temperatures, and leaks in up to eight tanks. System shall be UL listed as intrinsically safe for use in Class 1, Group C & D Hazardous Locations when wired in accordance with manufacturers control drawing. System shall also be Third Party Certified and listed to meet EPA leak detection requirements. Locate monitor console where shown on project drawings.
 2. Central Processing and Indicating Instrument – Controller shall have a 4x40 character liquid crystal display and backlit 36 character thermal printer. The system shall provide a 4-20ma output board capable of simultaneously outputting a 4-20ma output proportional to tank content. This 4-20ma signal shall be programmable to output proportional to gallons or inches. System must be capable of driving single or multi-tank 12 VDC NEMA 4 X remote audio visual high level alarms. System must capable of providing up to 16 individually programmed isolated relay contacts for any alarm event. Controller shall be as manufactured by OMNTEC Mfg., Model No. OEL8000II/P with optional expansion cards IB-C420, IB-RAS and IB-RB2 as needed.
 3. The main console should be preprogrammed by the factory with tanks, alarms and site parameters. Console shall include four RS-232 ports, one RS-485 port and have internal modem/network card capability for

communication. The complete leak/level gauging system shall include one year parts and labor warranty. The complete leak/level monitoring system shall be as manufactured by Omntec Mfg. Inc. Ronkonkoma, NY #877.228.3448 or equal.

- B. The liquid level probe:
 - 1. Shall consist of a 316 grade stainless steel IP68 rated rigid model MTG level probes or model MTG-F Kynar flexible level probes where overhead clearance is not available. Probe shall use magnetostrictive technology and simultaneously provide product levels, water levels, and temperature within the storage tanks.
 - 2. The level probe shall be installed in an accessible 4" NPT male riser pipe. Probe shall include 4" cord griped cap, floats, and installation kit. All splices must use supplied epoxy kits. Field wiring from probe to controller must be Belden 8761 cable in suitable conduit. Level probes shall be as manufactured by Omntec Mfg., Inc.
- C. The Smart Leak Sensors:
 - 1. All leak sensors shall be microprocessor based and capable of recognizing its unique serial number, part number, and function. All sensors (up to 22) shall be capable of being installed on (1) four conductor cable back to the main controller. The sensors principle of operation shall be electro optic for liquid detection and conductivity to discriminate fuel and water. Sensors shall be remotely testable from console via green tactile test button. Sensors shall be capable of detecting liquid at any angle. Float technology will not be accepted. Interstitial sensors shall be model # BX-PDWS for steel tank interstitials and BX-PDS for containment sumps. See project drawings for location and quantities of sensors required. All sensors are to be wired thru conduits using 22 gauge four conductors, shielded cable with drain wire. Do not run intrinsically safe low voltage wiring in the same conduit with any other wiring. All sensors shall be as manufactured by Omntec Mfg.
- D. Overfill Station:
 - 1. Provide near each tank fill terminal as shown on project drawings a low voltage audio/visual NEMA 4X overfill alarm and silencing station. Remote annunciator light shall flash when the liquid level in the tank rises above a pre-programmed caution point. As level then rises above the preprogrammed high/high level point the flashing light will stay on continuously and the horn will pulse. The horn will remain on until the silence button is pressed. Remote audible shall have the ability to be programmed to time out. Visual light will remain lit until the level in the tank drops below the high/ high level point. Remote annunciator shall be RAS -series for single or multi-tanks and shall be manufactured by Omntec Mfg., Inc.

2.6 ACCESSORY EQUIPMENT

- A. Manhole cover/tank sump shall be a 42" water tight, composite H20 load rating by Flexing, Inc., Sherman, TX.

- B. Drop tube for gasoline/diesel to be model # 61SO by OPW.
- C. Manholes for access to all annular space monitor fittings; to be manufactured by Flexing, Inc. Sherman, TX.
- D. Fill and vent caps, adapter, vent ball float extractor fitting, safety valves at dispenser to be manufactured by Flexing Mfg., Sherman, TX.
- E. Flex connector used under dispensers and in tank sumps shall be UL listed Fireflex SS EZ FIT and shall be manufactured by FLEXING, Sherman, Texas.

PART 3 - INSTALLATION

3.1 INSTALLATION

- A. Tanks shall be buried with 4 feet of fill over the top of the tank. The tanks shall be encompassed with 12 inches of sand or pea gravel. The backfill materials shall be compacted to 95 percent. Holiday tests, with 5-psig pressure, shall be performed in the presence of the IOR and shall continue while backfilling the tank.
- B. Tanks shall be strapped to a reinforced concrete foundation beneath, with 12 inches of compacted sand between tank and the concrete.
- C. Tanks shall be tested, inspected and installed per applicable specifications of the Illinois Office of the State Fire Marshal, N.F.P.A. Guidelines for Fueling Systems, Uniform Building Code, National Electrical Code and the City of Wheaton, Illinois.
- D. Tank anchoring systems indicated on the Drawings shall be furnished as minimum guidelines. Anchoring system shall conform to local codes and manufacturer's specifications or recommendations.
- E. Install the supply and return lines as indicated on the Drawings. Rigid pipe installed in the tanks shall terminate 4 inches from the bottom.
- F. Install a 4-inch, schedule 40, 316SS riser from the 4-inch fill coupling connection to the bottom of the containment box. An aluminum drop-tube is required for each fuel return point with Buna seal. Tubes shall be cut at 45-degree angles at the bottom end 4 inches from the tank bottom to provide correct length. Furnish tubes and perform tube installation. The plate under the fill tube shall be built-in (by tank manufacturer). Furnish a fill adapter and FRP fill cap, with Buna seal, for the 4-inch riser. Epoxy-seal the exposed 4-inch pipe threads at the tank coupling, the bottom of the containment box; and wrap the 4 inches riser.
- G. A brass nameplate on each manhole cover shall be secured (riveted) to identify the function of each installed accessories enclosed (e.g. diesel, leak monitor, tank gauge).
- H. Backfill material shall be compacted to 94 percent.

- I. Size excavation perimeter to allow minimum of 18 inches between the tank sides/ends.
- J. A minimum of 12 inches of backfill material is required under the tanks.
- K. The minimum depth of cover for tanks is 3 feet 0 inches and the maximum if 7 feet 0 inches.
- L. Backfill and Bedding Material:
 - 1. Approved backfill materials:
 - a. Pea Gravel - a clean naturally rounded aggregate with 1/8-inch minimum and a 3/4-inch maximum diameter. No more than 5 percent of the particles may pass through an #8 sieve.
 - b. Stone or Gravel Crushings - washed and free flowing angular material with particle size between 1/8-inch and 1/2-inch and meeting ASTM C-33 paragraph 9.1 requirements. No more than 5 percent of the particles may pass through an #8 sieve.
 - 2. Alternate backfill materials not meeting the above requirements for approved materials shall be submitted to the owner's representative for approval. The tank manufacturer's approval is also required to preserve the tank warranty.
- M. Bedding of Tanks:
 - 1. A 12-inch minimum bed of backfill material shall be placed in the excavation, smoothed.
- N. Setting Underground Tanks:
 - 1. Burial depth of tank shall be a minimum of 3 feet 7 inches and a maximum of 7 feet - 0 inches. Connections on fittings will be approximately 5 inches to 6 inches off the tip of the tank and shall be considered in the slope of the piping which may affect the tank burial depth.
- O. Tanks shall be anchored using straps and deadmen as recommended by tank manufacturer. Deadmen used shall have a 30 day minimum cure time.
- P. Field Quality Control:
 - 1. Tests shall be witnessed by the owner's representative & Fire Department. Notify owner's representative 72 hours in advance of when ready for testing.
 - 2. Pre-Installation Testing and Soaping:
 - a. All tanks are tested prior to shipment, but it is REQUIRED that tanks be tested by the installer prior to installation.
 - 3. Vacuum applied to the tanks prior to shipment is NOT acceptable as pre-Installation test.
 - 4. Tanks shall be pressure tested (3 psig minimum, 5 psig maximum) in accordance with the manufacturer's recommendations. Particular attention shall be given to the sequence and procedure for the primary (internal) tank test and the secondary (external) tank set.
 - a. Soaping shall be done using a small garden-type hand-pressurized spray unit. The test soap shall be high foaming "soap" that bubbles easily if in contact with a leak in the tank, but will not bubble during

dispensing from the pressure applicator. Acceptable soaps include: Seam Test Concentrate, Amway Loc High Soap & #7006 Southbend Leak Detection.

5. Post-Installation Testing:
 - a. After installation and before final backfilling to grade, the tanks must be retested to assure no damage occurred during installation.
 - b. Pressure test (3 psig minimum, 5 psig maximum) in accordance with manufacturer's recommendations giving particular attention to the sequence for the primary and secondary tank test.
6. Prior to installing final surface pavement over tanks, conduct a precision test as approved by the local Environmental Health Agency. Test shall be conducted using owner supplied fuel.
7. Installing contractor shall supply owner's representative with a sieve analysis of backfill used from the quarry from which backfill was obtained; confirming that said materials meets the subject specifications stated herein.
8. Installing contractor shall supply owner's representative with a copy of tank manufacturer's installation checklist filled out and signed upon completion of tank installation.

3.2 INSTALLATION/UNDERGROUND PIPING SYSTEM

- A. Dress all contact surfaces just prior to assembly and remove all foreign materials.
- B. Prepare adhesive in accordance with manufacturer's recommendations using clean materials. Do not exceed pot life of adhesive.
- C. Do not disturb joints until adhesive cures.
- D. Supply remote fill shall be pitched a minimum of 1/8" per foot and vapor recovery lines shall be pitched 1/4" per foot minimum from dispenser back to tank.
- E. Maintain clean work area and prevent pipe from contacting soil during assembly.
- F. Backfill and Bedding:
 1. Backfill materials surrounding all fiberglass underground piping shall consist of a minimum of 6 inches (all around piping) of pea gravel, crushed stone or other approved backfill as indicated in the tank installation portion of this specification.
- G. Testing:
 1. Air test primary piping at 50 psig and secondary piping according to manufacturer's instructions. Soap all fittings and joints while piping is under pressure to detect leaks. LCX secondary piping to be tested at a minimum of 30 PSI.
 2. Provide a copy of pipe manufacturer's installation checklist filled out and signed upon completion of pipe installation.

3.3 INSTALLATION OF LEAK DETECTION SYSTEM

- A. The installing contractor shall be responsible for the continuous storage tank management system according to the manufacturer's specification and instructions.
- B. The start-up contractor shall be responsible for insuring that any system placed in operation is designed so that each of its components works with the entire system to produce a single complete system for monitoring storage tanks and piping.
- C. Install per manufacturer's most current installation instructions.
- D. Start-up by factory authorized personnel is mandatory.

3.4 INSTALLATION/MANHOLE

- A. All manholes shall be set in a concrete protector slab, flush with adjacent grade or paved surface at the perimeter and sloping upward a minimum of 3/4-inch to the rim of the manhole to act as a water deflector.

3.5 TANK TEST

- A. The primary and secondary tanks shall be tested at 5 psig. Coordinate and arrange for the appropriate City Fire Department to inspect and witness tanks and piping tests. Coordinate the date and time of each test with the IOR.

3.6 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.7 CLEANUP

- A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

END OF SECTION

WATER PUMPING STATIONS GENERATOR REPLACEMENT

COST PROPOSAL

Page 1 of 2

Company Name

Signature of Bidder

Print Name

Title

Email Address

Address of Company

City

State

Zip Code

(Area Code) Phone Number

Date of Bid Response

BID RESPONSE DUE: Wednesday, May 3, 2017, before 11:00 a.m.

PLEASE SUBMIT 2 original proposals in sequential order as follows:

- 1) Cost Proposal on forms provided (2 pages total)
- 2) Bid Bond (10% of full bid price)
- 3) Notice of Deviations
- 4) Certification of Compliance
- 5) Contractor Profile and Submittal Requirements
- 6) Certificate of Insurance

Do not submit perforated pages, nor bind your proposal in anything other than paper clips or binder clips.

BIDDER has examined copies of all the bidding Documents and of the following Amendments

(receipt of all which is hereby acknowledged):

Amendment #

Date

Amendment #

Date

WATER PUMPING STATIONS GENERATOR REPLACEMENT

COST PROPOSAL

Page 2 of 2

BID RESPONSE DUE: Wednesday, May 3, 2017, before 11:00 a.m.
--

We hereby agree to furnish and deliver to the City of Wheaton, in accordance with the Terms and Conditions, Specifications, and Agreement Requirements as follows:

I. COUNTRYSIDE STATION GENERATOR: Total cost of work (including all labor, materials and profits)

Lump Sum Cost (Not to Exceed) \$ _____

Lead Time to Start: _____ calendar days

Time Required to Complete: _____ calendar days

II. PRESIDENT STREET STATION GENERATOR: Total cost of work (including all labor, materials and profits)

Lump Sum Cost (Not to Exceed) \$ _____

Lead Time to Start: _____ calendar days

Time Required to Complete: _____ calendar days

Firm Name _____

Signature _____

Print Name _____

Job Title _____

Date Signed _____

WATER PUMPING STATIONS GENERATOR REPLACEMENT

NOTICE OF DEVIATIONS

NOTICE OF DEVIATIONS for the (1) Specification and/or (2) Agreement Requirements: We deviate from (1) the desired specifications of the City of Wheaton and/or (2) the Standard Agreement, in the following areas (Please reference the specific requirement number):

As best as can be ascertained, there are no deviations other than those listed.

Firm Name_____

Signature_____

Print Name_____

Job Title_____

Date Signed_____

WATER PUMPING STATIONS GENERATOR REPLACEMENT

CERTIFICATION OF COMPLIANCE

The undersigned, being first duly sworn an oath, deposes and states that he/she has the authority to make this certification on behalf of the bidder for the product, commodity, or service and:

(A) The undersigned certifies that, pursuant to 720 ILCS Act 5, Article 33E of the Illinois Compiled Statutes, the bidder is not barred from bidding on this contract as a result of a conviction for the violation of State of Illinois laws prohibiting bid-rigging or bid-rotating.

(B) The undersigned certifies that, pursuant to 65 ILCS 5/11-42.1-1 of the Illinois Compiled Statutes, the bidder is not delinquent in the payment of any tax administered by the Illinois Department of Revenue.

(C) The undersigned certifies that, pursuant to 30 ILCS 580/3, Section 3 the bidder deposes, states and certifies it will provide a drug free workplace by complying to the Illinois Drug Free Workplace Act.

(D) The undersigned certifies that, pursuant to 820 ILCS 130/1-12 of the Illinois Compiled Statutes, the bidder, when required, is in compliance to all requirements of the Prevailing Wage Act.

(E) The undersigned certifies that, pursuant to 30 ILCS 570/ Section 5 Article 2 of the Illinois Compiled Statutes, the bidder is in compliance to all requirements of the Employment of Illinois Workers on Public Works Act.

(F) The undersigned certifies that they agree to fulfill all Requirements, Specifications, Terms, and Conditions.

(G) The undersigned certifies that they agree to fulfill all Contract Requirements.

(H) The undersigned certifies that they agree to present alternative Greener products/processes to the City for consideration in this work.

Check One:

☐ **There are no conflicts of interest;** In the event that a conflict of interest is identified anytime during the duration of this award, or reasonable time thereafter, you, your firm, or your firm's ownership, management or staff will immediately notify the City of Wheaton in writing.

☐ **There is an affiliation or business relationship** between you, your management or staff, your firm, or your firm's ownership, and an employee, officer, or elected official of the City of Wheaton who makes recommendations to the City of Wheaton with respect to expenditures of money, employment, and elected or appointed positions. Provide any and all affiliations or business relationships that might cause a conflict of interest or any potential conflict of interest. Include the name of each City of Wheaton affiliate with whom you, your firm, or your firm's ownership, management, or staff, has an affiliation or a business relationship.

This Business Firm is: (check one) ☐ a Corporation ☐ a Partnership ☐ an Individual ☐ an LLC

Firm Name: _____

Firm Address: _____

Signature: _____

Print Name: _____

Position: _____

Phone #: _____

Fax #: _____

e-mail address: _____

Date Signed: _____

Operational Contact for this work

Name: _____

Phone #: _____

e-mail: _____

Sales Contact

Name: _____

Phone #: _____

e-mail: _____

Billing Contact

Name: _____

Phone #: _____

e-mail: _____

Signing this Agreement affirms that the original solicitation document has not been altered in any

WATER PUMPING STATIONS GENERATOR REPLACEMENT

CONTRACTOR PROFILE AND SUBMITTAL REQUIREMENTS

The Contractor shall attach to this proposal:

☒ **This completed form**

☒ **Evidence of Experience and Capabilities:**

1. Experience as evidenced by a listing of five (5) references which demonstrate previous successful projects completed by the installer for comparable system during the last three (3) years.

Years in business: _____

Years in business under this name: _____

Years performing this type of work: _____

2. Work History

Value of work: completed in past 12 months: \$ _____ now under contract: \$ _____

Number of Clients: serviced in past 12 months: _____ now under contract: _____

☒ **Work Specific Knowledge and Ability**

3. A certification from the product manufacturer stating that the installer has been trained and approved in the installation of the product to be used. Certification letter shall be dated within twelve (12) months of bid date.
4. Manufacturer's product literature, installation recommendations, technical data sheets for each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications.
5. Manufacturer's certification that the products to be used meet the applicable referenced standards and these specifications.
6. Attach a list of the areas of work that will be performed by a sub-contractor.

☒ **Availability and Lead Time**

7. A properly executed Contractor's Qualification statement (AIA document A305).

☒ **Safe Risk**

8. An Insurance Certificate as evidence that the company is insured
9. Warranty Statement
10. Answer the following questions:

Has your firm: Failed to complete a contract? ☐ Yes ☐ No
 Been involved in bankruptcy or reorganization? ☐ Yes ☐ No
 Pending judgment claims or suits against firm? ☐ Yes ☐ No

Have you had any: OSHA fines within the last three (3) years? ☐ Yes ☐ No
 Job related fatalities within the last five (5) years? ☐ Yes ☐ No

If you have answered Yes to any of the above questions, you MUST submit, on a separate sheet, the details describing the circumstances surrounding each incident.

Firm Name _____

Signature _____

Print Name _____

Job Title _____

Date Signed _____

CUSTOMIZED MAILING LABEL FOR SEALED BID

XXXXXXXXXX CUT OUT XXXXXXXXXX

Cut along outer border and affix this label to your sealed bid envelope to identify it as a "Sealed Bid".

SEALED BID – DO NOT OPEN

PROPOSAL FOR:
WATER PUMPING STATIONS GENERATOR REPLACEMENT

PROPOSAL FROM: (Insert your company name below)

Sealed Bids Due: **May 3, 2017 before 11:00 a.m.**
Public Bid Opening: May 3, 2017 at 11:00 a.m.

TO BE OPENED BY PROCUREMENT OFFICER

MAIL TO:

**Procurement Office
City of Wheaton / City Hall
P.O. BOX 0727
303 West Wesley Street
Wheaton, IL 60187-0727**

**Agreement Between the City of Wheaton, Illinois
and _____**

WATER PUMPING STATIONS GENERATOR REPLACEMENT

This Agreement is entered into by and between the City of Wheaton, an Illinois municipal corporation ("City"), 303 West Wesley Street, Wheaton, IL 60187, and _____, ("Contractor"), address _____.

WITNESSETH:

Whereas, the City has determined that it is necessary to hire a contractor to provide labor, and/or materials and/or equipment to perform water pumping stations generator replacement (hereinafter the "Work") consistent with attached Exhibit A, which is incorporated herein and fully set forth; and

Whereas, the City finds the proposal submitted by the Contractor meets the City's service requirements for the Work.

Now, therefore, for in consideration of their mutual promises, terms, covenants, agreements, and conditions recited in this Agreement, the City and the Contractor hereto do hereby agree as follows:

1. Scope of Services. The Recital paragraphs are incorporated herein as substantive terms and conditions of this Agreement and as representing the intent of the parties. Any inconsistency between the Work as stated by the City and the work as proposed by the Contractor shall be controlled by the Work as stated by the City unless specifically varied in writing to the contrary in this paragraph.

The Contractor shall furnish all labor, materials, and equipment to provide and perform the Work. The Contractor represents and warrants that it shall perform the Work in a manner consistent with the level of care and skill customarily exercised by other professional contractors under similar circumstances. The Contractor shall be responsible for the work performed under the Agreement documents and every part thereof, and for all materials, tools, equipment, appliances, and property of any and all description used in connection with the Work. The Contractor assumes all risks for direct and indirect damage or injury to the property or persons used or employed on or in connection with the Work contracted for, and of all damage or injury to any person or property wherever located, resulting from any action, omission, commission, or operation under this Agreement, or in any way whatsoever with the Work.

2. Compensation. The City shall compensate the Contractor per the terms of the Contractor's proposal which is attached hereto as Exhibit A.

3. Term of Agreement. This Agreement shall become effective upon the latter of the date accepted and signed by the City and the date accepted and signed by the Contractor and shall terminate upon the written approval of the City's Project Manager.

4. Time is of the Essence. Time is of the essence in the performance of all the terms and conditions of this Agreement. Failure to meet stated terms may result in Liquidated Damages in the amount of \$500.00 per calendar day beyond the delivery date specified.

5. Additional Services. The Contractor shall provide only the Work specified in this Agreement and attached Exhibit. In the event the Contractor, Engineer or the City determines that additional goods and/or services are required to complete the Work, such additional goods shall not be provided and/or such additional services shall not be performed unless authorized in writing by the City. Terms, frequency, and prices for additional work shall be as mutually agreed upon in writing by the City and the Contractor.

6. Integration. The provisions set forth in this Agreement represent the entire agreement between the parties and supersede all prior agreements, contracts, promises, and representations, as it is the intent of the parties to provide for a complete integration within the terms of this Agreement. This Agreement may be modified only by a further written agreement between the parties, and no modification shall be effective unless properly approved and signed by each party via change order or amendment. No course of conduct before, or during the performance of this Agreement, shall be deemed to modify, change, or amend this Agreement.

7. Waiver. Any failure of either the City or the Contractor to strictly enforce any term, right, or condition of this Agreement, whether implied or expressed, shall not be construed as a waiver of such term, right, or condition.

8. Compliance with Laws. The Contractor shall comply with all applicable federal, state, and local laws, rules, and regulations, and all City ordinances, rules, and regulations now in force or hereafter enacted, in the provision of the goods and/or performance of the services required under this Agreement.

9. Freedom of Information Act: The Contractor shall, within twenty-four hours of the City's request, provide any documents in the Contractor's possession related to the Agreement which the City is required to disclose to a requester under the Illinois Freedom of Information Act. This provision is a material covenant of this Agreement. Contractor agrees to not apply any costs or charge any fees to the City regarding the procurement of records required pursuant to a FOIA request. Should Contractor request that City utilize a lawful exemption under FOIA in relation to any FOIA request thereby denying that request, Contractor agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fee, and any other expenses) to defend the denial of the request. The defense shall include, but not be limited to, challenged or appealed denials of FOIA requests to either the Illinois Attorney General or a court of competent jurisdiction. Contractor agrees to defend, indemnify, and hold harmless City, and agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees and any other expenses) to defend any denial of a FOIA request by Contractor's request to utilize a lawful exemption to City.

10. Discrimination Prohibited. The Contractor shall comply with the provisions of the Illinois Human Rights Act, as amended, 775 ILCS 5/1-101 et seq. (1992 State Bar Edition), and with all rules and regulations established by the Department of Human Rights. The Contractor agrees that it will not deny employment to any person or refuse to enter into any contract for services provided for in this Agreement to be performed on its behalf on the basis of unlawful discrimination as defined in the Illinois Human Rights Act.

11. Prevailing Wage: Where applicable, the Contractor and any subcontractors shall comply with all provisions of the Prevailing Wage Act, 820 ILCS 130/1 et seq., or any successor statute, and the documents entitled "Special Provisions for: Wages of Employees on Public Works," and "DuPage County Prevailing Wage for ...".

12. Status of Independent Contractor. Both City and Contractor agree that Contractor will act as an independent contractor in the performance of the Work. Accordingly, the independent contractor shall be responsible for payment of all taxes including federal, state, and local taxes arising out of the Contractor's activities in accordance with this Agreement, including by way of illustration but not limitation, federal and state income tax, social security tax, and any other taxes or license fees as may be required under the law. Contractor further acknowledges under the terms of this Agreement, that it is not an agent, employee, or servant for the City for any purpose, and that it shall not hold itself out as an agent, employee, or servant of the City under any circumstance for any reason. Contractor is not in any way authorized to make any contract, agreement, or promise on behalf of City, or to create any implied obligation on behalf of City, and Contractor specifically agrees that it shall not do so. City shall have no obligation to provide any compensation or benefits to Contractor, except those specifically identified in this Agreement. City shall not have the authority to control the method or manner by which Contractor complies with the terms of this Agreement.

13. Assignment; Successors and Assigns. Neither this Agreement, nor any part, rights, or interests hereof, may be assigned, to any other person, firm, or corporation without the written consent of all other parties. Upon approval of assignment, this Agreement and the rights, interests and obligations hereunder shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and assigns.

14. Non-disclosure. During the course of the Work Contractor may have access to proprietary and confidential information including, but not limited to, methods, processes, formulae, compositions, systems, techniques, computer programs, databases, research projects, resident name and address information, financial data, and other data. Contractor shall not use such information for any purpose other than described in this Agreement and Exhibits and shall not directly or indirectly disclose or disseminate such information to any third party without the express written consent of the City.

15. Hold Harmless and Indemnification. The Contractor shall defend, hold harmless, and indemnify the City, its directors, officers, employees, agents, and elected officials, in whole or in part from and against any and all liabilities, losses, claims, demands, damages, fines, penalties, costs, and expenses, judgment, or settlement, including, but not limited to, reasonable attorneys' fees and costs of litigation including reasonable expert witness, and all causes of action of any kind or character, that may be incurred as a result of bodily injury, sickness, death, or property damage or as a result of any other claim or suit of any nature whatsoever arising from or in any manner connected with directly or indirectly, the negligent acts, errors, omissions, or intentional acts or omissions, or omissions of any agent, subcontractor, or contractor hired to perform any services on behalf of the Contractor.

16. Termination of Agreement. If the Contractor fails to perform according to the terms of this Agreement, then the City may terminate this Agreement upon seven (7) days written notice to the Contractor. In the event of a termination, the City shall pay the Contractor for services performed as of the effective date of termination, less any sums attributable, directly or indirectly, to Contractor's breach. The City shall have the right to terminate this Agreement, without cause, upon twenty-one (21) days written notice to the Contractor. The Contractor shall be paid for all work performed in conformance with the Agreement through the effective date of the not for cause termination. The written notice required under this paragraph shall be either (i) served personally during regular business hours; (ii) served by facsimile data transmission during regular business hours; (iii) by e-mail or (iv) served by certified or registered mail, return receipt requested, addressed to the address listed in this Agreement with postage prepaid and deposited in the United States

mail. Notice served personally and by facsimile data transmission shall be effective upon receipt, and notice served by United States mail shall be effective three (3) business days after mailing.

17. Cancellation for Unappropriated Funds: The obligation of the City for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period, and continuation of the agreement into a subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

18. Default. In case of default by the Contractor, the City will procure articles or service from other sources and hold the Contractor responsible for any excess cost incurred. The City reserves the right to cancel the whole or any part of the agreement if the Contractor fails to perform any of the provisions in the Agreement, fails to make delivery within the time stated, becomes insolvent, suspends any of its operations, or if any petition is filed or proceeding commenced by or against the Contractor under any State or Federal law relating to bankruptcy arrangement, reorganization, receivership, or assignment for the benefit of creditors. The Contractor will not be liable to perform if situations arise by reason of strikes, acts of God or the public enemy, acts of the City, fires, or floods.

19. Force Majeure. No party hereto shall be deemed to be in default or to have breached any provision of this Agreement as a result of any delay, failure in performance or interruption of services resulting directly or indirectly from acts of God, acts of civil or military disturbance, or war, which are beyond the control of such non-performing party.

20. Notification. All notification under this Agreement shall be made as follows:

If to the Contractor:

Contractor Name

Attn:

Street Address

City, State, Zip Code

Fax #

e-mail

If to the City:

City of Wheaton

Attn: City Clerk

303 West Wesley Street Box 727

Wheaton, IL 60187-0727

Fax # 630-260-2017

e-mail cityclerk@wheaton.il.us

21. Severability. If any provision of this Agreement is held to be illegal, invalid, or unenforceable, such provision shall be fully severable, and this Agreement shall be construed and enforced as if such illegal, invalid, or unenforceable provision were never a part hereof; the remaining provisions hereof shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision or by its severance; and in lieu of such illegal, invalid, or unenforceable provision there shall be added automatically as part of this Agreement, a provision as similar in its terms to such illegal, invalid, or unenforceable provision as may be possible and legal, valid and enforceable.

22. Recovery of Costs. In the event the City is required to file any action, whether legal or equitable, to enforce any provision of this Agreement, the City shall be entitled to recover all costs and expenses incurred as a result of the action or proceeding, including expert witness and attorney's fees, if so provided in any order of the Court.

23. Governing Law. This Agreement is governed by the laws of the State of Illinois. Exclusive jurisdiction for any litigation involving any aspect of this Agreement shall be in the Eighteenth Judicial Circuit Court, DuPage County, Illinois.

In Witness Whereof, the parties have entered into this Agreement this ____ day of _____, 2017.

City of Wheaton, an Illinois municipal corporation

By: _____ Date: _____

Title: _____

Attest:

Sharon Barrett-Hagen, City Clerk

Contractor

By: _____ Date: _____

Title: _____

Attest:

**Special Provisions for:
Insurance Coverage for Contractual Services**

The Contractor and each of its agents, subcontractors, and consultants hired to perform the Work, shall purchase and maintain during the term of this contract insurance coverage which will satisfactorily insure the Contractor and where appropriate, the City against claims and liabilities which may arise out of the Work. Such insurance shall be issued by companies authorized to do business in the State of Illinois and approved by the City. The insurance coverages shall include, but not necessarily be limited to, the following:

- **Worker's Compensation Insurance** with limits as required by the applicable statutes of the State of Illinois. The employer's liability coverage under the worker's compensation policy shall have limits not less than **FIVE HUNDRED THOUSAND DOLLARS (\$500,000)** and each accident/injury and **FIVE HUNDRED THOUSAND DOLLARS (\$500,000) each employee/disease and FIVE HUNDRED THOUSAND DOLLARS (\$500,000)** policy limit.

The workers' compensation policy shall provide a waiver of subrogation (aka Waiver of our Right to Recover from Others Endorsement), to the City.

- **Commercial General Liability Insurance** protecting the Contractor against any and all liability claims which may arise in the course of performance of this contract. The limits of liability shall be not less than **ONE MILLION DOLLARS (\$1,000,000)** each occurrence bodily injury/property damage combined single limit and **ONE MILLION DOLLARS (\$1,000,000)** aggregate bodily injury/property damage combined single limit. The policy of commercial liability insurance shall include contractual liability coverage and an endorsement naming the City as an additional insured on a primary and non-contributory basis. Completed Operations coverage shall continue for a period of two years after completion of the project. XCU coverage shall be included.
- **Commercial Automobile Liability Insurance** covering the Contractor's owned, non-owned, and hired vehicles which protects the Contractor against automobile liability claims whether on or off of the city's premises with coverage limits of not less than **ONE MILLION DOLLARS (\$1,000,000)** per accident bodily injury/property damage combined single limit. The policy of commercial liability insurance shall include contractual liability coverage and an endorsement naming the City as an additional insured on a primary and non-contributory basis.
- **Umbrella or Excess Liability Insurance** coverage of not less than **ONE MILLION (\$1,000,000)** per occurrence.

Nothing herein set forth shall be construed to create any obligation on the part of the City to indemnify Contractor for any claims of negligence against Contractor or its agents, employees, subcontractors or consultants. Prior to commencement of any work under this Agreement, Contractor shall file with the City the required original certificates of insurance with endorsements, including those of subcontractors, which shall clearly state all of the following:

- A. The policy number; name of insurance company; name and address of the agent or authorized representative; name, address, and telephone number of the insured; project name and address; policy expiration date; and specific coverage amounts; and
- B. That the City of Wheaton (including its agents, elected officials, officers and employees) is named as an additional insured under all coverage, except Workers' Compensation, and that all such coverage shall be primary and non-contributory for the City, its agents, elected officials, officers, and employees. A waiver of subrogation (aka Waiver of our Right to Recover from Others Endorsement), on all coverages shall be provided; and

- C. Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions; and
- D. Contractor's insurance is primary with respects to any other valid or collectible insurance City may possess, including any self-insured retention that City may have; and
- E. Any deductibles or self-insured retention shall be stated on the certificates of insurance provided to the City; and

In addition to all of the insurance requirements identified above and contained on the certificates of insurance, all policies of insurance coverage under this section shall also be subject to the following requirements.

- F. All insurance carriers providing coverage under this Agreement shall be authorized to do business in the State of Illinois and shall be rated at least A:VI in A.M. Best and Companies Insurance Guide or otherwise acceptable to the City.
- G. The City of Wheaton shall have the right to reject the insurer/insurance of the contractor or any subcontractor; and
- H. Occurrence policies are preferred. The city may accept claims made policies for Professional Liability or Pollution/Environmental Liability on a case by case basis providing the contractor purchases a claims made policy for four (4) years past the contract completion date.
- I. The City will consider deductible amounts as part of its review of the financial stability of the bidder; and
- J. No acceptance and/or approval of any insurance by the City shall be construed as relieving or excusing the Contractor, or the surety, or its bond, from any liability or obligation imposed upon either or both of them by the provisions of the Contract Documents; and
- K. The City may require increases in Contractor's insurance coverage amounts over the course of this Agreement as it deems necessary so long as it reimburses Contractor for the actual increase in Contractor's insurance premiums attributable to the City's requested increase; and
- L. Insurance coverage required by this contract shall be in force throughout the Contract Term and upon written request by the City, the Contractor shall, within 7 days, provide to the City acceptable evidence of current insurance. Should the Contractor fail to provide acceptable evidence of current insurance following written request, the City shall have the absolute right to terminate the Contract without any further obligation to the Contractor; and
- M. Contractual and other liability insurance provided under this Contract shall not contain a supervision, inspection or engineering services exclusion that would preclude the City from supervising or inspecting the project to the end result. The Contractor shall assume all on-the-job responsibilities as to the control of persons directly employed by it; and
- N. All existing structures, utilities, roads, services, trees, shrubbery and landscaping shall be protected against damage or interruption of service at all times by the Contractor and its subcontractors during the term of the Contract.

END OF SPECIAL PROVISIONS FOR INSURANCE COVERAGE FOR CONTRACTUAL SERVICES



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s). **A waiver of subrogation is required.**

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No. Ext):	FAX (A/C, No):
INSURED	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	NAIC #	
	INSURER A :	
	INSURER B :	
	INSURER C :	
INSURER D :		
INSURER E :		
INSURER F :		

COVERAGES**CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	GENERAL LIABILITY						EACH OCCURRENCE \$ \$1,000,000
	<input type="checkbox"/> COMMERCIAL GENERAL LIABILITY						DAMAGE TO RENTED PREMISES (Ea occurrence) \$
	<input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR						MED EXP (Any one person) \$
							PERSONAL & ADV INJURY \$ \$1,000,000
							GENERAL AGGREGATE \$ \$3,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG \$ \$3,000,000
	<input type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC						\$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident) \$ \$1,000,000
	<input type="checkbox"/> ANY AUTO						BODILY INJURY (Per person) \$
	<input type="checkbox"/> ALL OWNED AUTOS	<input type="checkbox"/> SCHEDULED AUTOS					BODILY INJURY (Per accident) \$
	<input type="checkbox"/> HIRED AUTOS	<input type="checkbox"/> NON-OWNED AUTOS					PROPERTY DAMAGE (Per accident) \$
							\$
	UMBRELLA LIAB	<input type="checkbox"/> OCCUR					EACH OCCURRENCE \$ \$5,000,000
	EXCESS LIAB	<input type="checkbox"/> CLAIMS-MADE					AGGREGATE \$ \$5,000,000
	DED <input type="checkbox"/> RETENTION \$						\$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						<input type="checkbox"/> WC STATUTORY LIMITS <input type="checkbox"/> OTHER
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)	<input type="checkbox"/> Y / <input type="checkbox"/> N	N / A				E.L. EACH ACCIDENT \$ \$500,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE \$ \$500,000
	Professional Liability and Errors and Omissions:						E.L. DISEASE - POLICY LIMIT \$ \$500,000
	Owners/Contractors Protection						\$ \$5,000,000
	XCU Coverage Included with General Liability						\$ \$5,000,000
	Pollution/Environmental Liability						

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Bid/Project Name or Contract Name and #
Contractor
Contact
Address
Phone #, Email Address, Fax #

- The City of Wheaton is an additional insured on a primary and non-contributory basis on all insurance policies with respect to Liability.
- Endorsements and a Waiver of Subrogation shall be provided for all policies with each updated certificate.
- Contractors: It shall be the responsibility of the contractor to insure that all subcontractors comply with the same insurance requirements.

CERTIFICATE HOLDER**CANCELLATION**

City of Wheaton 303 West Wesley Street PO Box 727 Wheaton, IL 60187-0727 Attn: Procurement Officer (fax) 630-260-2017	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

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Special Provisions for: Wages of Employees on Public Works

This contract may be subject to the "Prevailing Wage Act," 820 ILCS 130/1 et seq ("The Act"). It shall be the responsibility of the contractor to determine whether the Act is applicable and if so to comply with all its terms and conditions. Any contractor having a question as to whether the Act is applicable shall consult with their own attorney to ascertain applicability. The City shall not have any duty to inform the contractor of the Acts applicability. If however the City informs the contractor that the Act is applicable it shall be the contractor's obligation to comply with all its terms and conditions unless the contractor can establish to the satisfaction of the City that the Act is inapplicable. If it is determined that The Act applies to this contract, all contractors and subcontractors subject to its terms shall comply with all of its provisions, including, but not limited to the following:

1. Not less than the prevailing rate of wages as found by the City of Wheaton or Department of Labor or determined by a court on review shall be paid to all laborers, workers and mechanics performing work under this contract. These prevailing rates of wages are included in this contract.
2. In all contractors' bonds the contractor shall include a provision that will guarantee the faithful performance of the prevailing wage clause provided by this contract.
3. If the Department of Labor revises the prevailing rate of hourly wages to be paid by the public body, the revised rate shall apply to the contractor, and the public body shall be responsible to notify the contractor and each subcontractor, of the revised rate.
4. The contractor and each subcontractor shall:
 - a. make and keep, for a period of not less than 3 years, records of all laborers, mechanics, and other workers employed by them on the project; the records shall include each worker's name, address, telephone number when available, social security number, classification or classifications, the hourly wages paid in each pay period, the number of hours worked each day, and the starting and ending times of work each day; and
 - b. submit monthly, in person, by mail, or electronically a certified payroll to the public body in charge of the project. The certified payroll shall consist of a complete copy of the records identified in paragraph (1) of this subsection (a). The certified payroll shall be accompanied by a statement signed by the contractor or subcontractor which avers that:
 - i. such records are true and accurate;
 - ii. the hourly rate paid to each worker is not less than the general prevailing rate of hourly wages required by this Act; and
 - iii. the contractor or subcontractor is aware that filing a certified payroll that he or she knows to be false is a Class B misdemeanor.
5. Upon 2 business days' notice, the contractor and each subcontractor shall make available for inspection the records identified in paragraph 4 to the City of Wheaton, its officers and agents, and to the Director of Labor and his deputies and agents during reasonable hours at a location within this State.

Du Page County Prevailing Wage for July 2015

(See explanation of column headings at bottom of wages)

Trade Name	RG	TYP	C	Base	FRMAN	M-F>8	OSA	OSH	H/W	Pensn	Vac	Trng
=====	==	===	=	=====	=====	=====	=====	=====	=====	=====	=====	=====
ASBESTOS ABT-GEN		ALL		39.400	39.950	1.5	1.5	2.0	13.98	10.72	0.000	0.500
ASBESTOS ABT-MEC		BLD		36.340	38.840	1.5	1.5	2.0	11.47	10.96	0.000	0.720
BOILERMAKER		BLD		47.070	51.300	2.0	2.0	2.0	6.970	18.13	0.000	0.400
BRICK MASON		BLD		43.780	48.160	1.5	1.5	2.0	10.05	14.43	0.000	1.030
CARPENTER		ALL		44.350	46.350	1.5	1.5	2.0	11.79	16.39	0.000	0.630
CEMENT MASON		ALL		43.750	45.750	2.0	1.5	2.0	13.05	14.45	0.000	0.480
CERAMIC TILE FNSHER		BLD		36.810	0.000	1.5	1.5	2.0	10.55	9.230	0.000	0.770
COMMUNICATION TECH		BLD		32.650	34.750	1.5	1.5	2.0	9.550	15.16	1.250	0.610
ELECTRIC PWR EQMT OP		ALL		37.890	51.480	1.5	1.5	2.0	5.000	11.75	0.000	0.380
ELECTRIC PWR EQMT OP		HWY		39.220	53.290	1.5	1.5	2.0	5.000	12.17	0.000	0.390
ELECTRIC PWR GRNDMAN		ALL		29.300	51.480	1.5	1.5	2.0	5.000	9.090	0.000	0.290
ELECTRIC PWR GRNDMAN		HWY		30.330	53.290	1.5	1.5	2.0	5.000	9.400	0.000	0.300
ELECTRIC PWR LINEMAN		ALL		45.360	51.480	1.5	1.5	2.0	5.000	14.06	0.000	0.450
ELECTRIC PWR LINEMAN		HWY		46.950	53.290	1.5	1.5	2.0	5.000	14.56	0.000	0.470
ELECTRIC PWR TRK DRV		ALL		30.340	51.480	1.5	1.5	2.0	5.000	9.400	0.000	0.300
ELECTRIC PWR TRK DRV		HWY		31.400	53.290	1.5	1.5	2.0	5.000	9.730	0.000	0.310
ELECTRICIAN		BLD		38.160	41.980	1.5	1.5	2.0	9.550	18.29	4.680	0.680
ELEVATOR CONSTRUCTOR		BLD		50.800	57.150	2.0	2.0	2.0	13.57	14.21	4.060	0.600
FENCE ERECTOR	NE	ALL		37.340	39.340	1.5	1.5	2.0	13.05	12.06	0.000	0.300
FENCE ERECTOR	W	ALL		45.060	48.660	2.0	2.0	2.0	10.52	20.76	0.000	0.700
GLAZIER		BLD		40.500	42.000	1.5	2.0	2.0	13.14	16.99	0.000	0.940
HT/FROST INSULATOR		BLD		48.450	50.950	1.5	1.5	2.0	11.47	12.16	0.000	0.720
IRON WORKER	E	ALL		44.200	46.200	2.0	2.0	2.0	13.65	21.14	0.000	0.350
IRON WORKER	W	ALL		45.060	48.660	2.0	2.0	2.0	10.52	20.76	0.000	0.700
LABORER		ALL		39.200	39.950	1.5	1.5	2.0	13.98	10.72	0.000	0.500
LATHER		ALL		44.350	46.350	1.5	1.5	2.0	11.79	16.39	0.000	0.630
MACHINIST		BLD		45.350	47.850	1.5	1.5	2.0	7.260	8.950	1.850	0.000
MARBLE FINISHERS		ALL		32.400	34.320	1.5	1.5	2.0	10.05	13.75	0.000	0.620
MARBLE MASON		BLD		43.030	47.330	1.5	1.5	2.0	10.05	14.10	0.000	0.780
MATERIAL TESTER I		ALL		29.200	0.000	1.5	1.5	2.0	13.98	10.72	0.000	0.500
MATERIALS TESTER II		ALL		34.200	0.000	1.5	1.5	2.0	13.98	10.72	0.000	0.500
MILLWRIGHT		ALL		44.350	46.350	1.5	1.5	2.0	11.79	16.39	0.000	0.630
OPERATING ENGINEER		BLD	1	48.100	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		BLD	2	46.800	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		BLD	3	44.250	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		BLD	4	42.500	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		BLD	5	51.850	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		BLD	6	49.100	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		BLD	7	51.100	52.100	2.0	2.0	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		FLT		36.000	36.000	1.5	1.5	2.0	17.10	11.80	1.900	1.250
OPERATING ENGINEER		HWY	1	46.300	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		HWY	2	45.750	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		HWY	3	43.700	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		HWY	4	42.300	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		HWY	5	41.100	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		HWY	6	49.300	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
OPERATING ENGINEER		HWY	7	47.300	50.300	1.5	1.5	2.0	17.55	12.65	1.900	1.250
ORNAMNTL IRON WORKER E		ALL		45.000	47.500	2.0	2.0	2.0	13.55	17.94	0.000	0.650
ORNAMNTL IRON WORKER W		ALL		45.060	48.660	2.0	2.0	2.0	10.52	20.76	0.000	0.700
PAINTER		ALL		41.730	43.730	1.5	1.5	1.5	10.30	8.200	0.000	1.350
PAINTER SIGNS		BLD		33.920	38.090	1.5	1.5	1.5	2.600	2.710	0.000	0.000
PILEDRIIVER		ALL		44.350	46.350	1.5	1.5	2.0	11.79	16.39	0.000	0.630
PIPEFITTER		BLD		46.000	49.000	1.5	1.5	2.0	9.000	15.85	0.000	1.780
PLASTERER		BLD		43.430	46.040	1.5	1.5	2.0	10.05	14.43	0.000	1.020
PLUMBER		BLD		46.650	48.650	1.5	1.5	2.0	13.18	11.46	0.000	0.880

ROOFER		BLD	41.000	44.000	1.5	1.5	2.0	8.280	10.54	0.000	0.530
SHEETMETAL WORKER		BLD	44.720	46.720	1.5	1.5	2.0	10.65	13.31	0.000	0.820
SPRINKLER FITTER		BLD	49.200	51.200	1.5	1.5	2.0	11.75	9.650	0.000	0.550
STEEL ERECTOR	E	ALL	42.070	44.070	2.0	2.0	2.0	13.45	19.59	0.000	0.350
STEEL ERECTOR	W	ALL	45.060	48.660	2.0	2.0	2.0	10.52	20.76	0.000	0.700
STONE MASON		BLD	43.780	48.160	1.5	1.5	2.0	10.05	14.43	0.000	1.030
SURVEY WORKER	----->	NOT IN EFFECT	ALL	37.000	37.750	1.5	1.5	2.0	12.97	9.930	0.000
0.000	0.500										
TERRAZZO FINISHER		BLD	38.040	0.000	1.5	1.5	2.0	10.55	11.22	0.000	0.720
TERRAZZO MASON		BLD	41.880	44.880	1.5	1.5	2.0	10.55	12.51	0.000	0.940
TILE MASON		BLD	43.840	47.840	1.5	1.5	2.0	10.55	11.40	0.000	0.990
TRAFFIC SAFETY WRKR		HWY	32.750	34.350	1.5	1.5	2.0	6.550	6.450	0.000	0.500
TRUCK DRIVER		ALL 1	35.920	36.120	1.5	1.5	2.0	8.280	8.760	0.000	0.150
TRUCK DRIVER		ALL 2	32.700	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER		ALL 3	32.900	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TRUCK DRIVER		ALL 4	33.100	33.100	1.5	1.5	2.0	6.500	4.350	0.000	0.150
TUCKPOINTER		BLD	42.620	43.620	1.5	1.5	2.0	10.05	13.34	0.000	0.670

Legend: RG (Region)

TYP (Trade Type - All, Highway, Building, Floating, Oil & Chip, Rivers)

C (Class)

Base (Base Wage Rate)

FRMAN (Foreman Rate)

M-F>8 (OT required for any hour greater than 8 worked each day, Mon through Fri.)

OSA (Overtime (OT) is required for every hour worked on Saturday)

OSH (Overtime is required for every hour worked on Sunday and Holidays)

H/W (Health & Welfare Insurance)

Pensn (Pension)

Vac (Vacation)

Trng (Training)

Explanations

DUPAGE COUNTY

IRON WORKERS AND FENCE ERECTOR (WEST) - West of Route 53.

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

TRAFFIC SAFETY - work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary lane markings, and the installation and removal of temporary road signs.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS TECHNICIAN

Low voltage installation, maintenance and removal of telecommunication facilities (voice, sound, data and video) including telephone and data inside wire, interconnect, terminal equipment, central offices, PABX, fiber optic cable and equipment, micro waves, V-SAT, bypass, CATV, WAN (wide area networks), LAN (local area networks), and ISDN (integrated system digital network), pulling of wire in raceways, but not the installation of raceways.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes

for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under; Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Heavy Duty Self-Propelled Transporter or Prime Mover; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician; Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Operation of Tie Back Machine; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Laser Screed; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators (remodeling or renovation work); Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 4. Bobcats and/or other Skid Steer Loaders; Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics; Welders.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines: ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Spider Crane; Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dredges; Elevators, Outside type Rack & Pinion and Similar Machines; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Heavy Duty Self-Propelled Transporter or Prime Mover; Hydraulic Backhoes; Backhoes with shear attachments up to 40' of boom reach; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Snow Melters; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Operation of Tieback Machine; Tractor Drawn Belt Loader; Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Traffic Barrier Transfer Machine; Trenching; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; Hydro Excavating (excluding hose work); Laser Screed; All Locomotives, Dinky; Off-Road Hauling Units (including articulating) Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper - Single/Twin Engine/Push and Pull; Scraper - Prime Mover in Tandem (Regardless of Size); Tractors pulling attachments, Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Light Plants, All

(1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Vacuum Trucks (excluding hose work); Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. SkidSteer Loader (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Dowell Machine with Air Compressor; Gradall and machines of like nature.

OPERATING ENGINEER - FLOATING

Diver. Diver Wet Tender, Diver Tender, ROV Pilot, ROV Tender

SURVEY WORKER - Operated survey equipment including data collectors, G.P.S. and robotic instruments, as well as conventional levels and transits.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnapulls or Turnatrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnatrailers or turnapulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and

Terrazzo Mechanics.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

MATERIAL TESTER & MATERIAL TESTER/INSPECTOR I AND II

Notwithstanding the difference in the classification title, the classification entitled "Material Tester I" involves the same job duties as the classification entitled "Material Tester/Inspector I". Likewise, the classification entitled "Material Tester II" involves the same job duties as the classification entitled "Material Tester/Inspector II".

Agreement #: _____
Agreement Addendum #: _____
For Office Use Only

Agreement Between the City of Wheaton, IL
and _____

WATER PUMPING STATIONS GENERATOR REPLACEMENT

CHANGE ORDER # _____

Change Order required due to:

- ☐ Changed/Unforeseen Condition
☐ Change in Scope
☐ Errors and Omissions
☐ Other: _____

Type of Change Order:

- ☐ Fixed Cost of \$ _____
☐ Time & Materials, not to exceed: \$ _____
☐ Emergency Change, not to exceed \$ _____
☐ Extension of Completion Date

Attached is: ☐ Service Providers Proposal ☐ Description of Change

Cost and Schedule Control Summary

**If this section is left blank, Change Order will not result
in additional charges:**

Original Agreement Amount \$ _____
Previous COs Adds/Deducts \$ _____
This CO Add/Deduct \$ _____
Revised Agreement Amount \$ _____

**If this section is left blank, Change Order will not result
in additional time to complete the project:**

Original Agreement Duration _____ days
Previous COs Add/Deduct _____ days
This CO Add/Deduct _____ days
Revised Agreement Duration _____ days
Revised Agreement Completion Date _____

The compensation (time and cost set forth in this Change Order comprises the total compensation due the Service Provider, all subcontractors, and all suppliers, for the work or change defined in this Change Order, including impact on the unchanged work. By signing the Change Order, the Service Provider acknowledges and agrees on behalf of himself, all subcontractors, and all suppliers, that the stipulated compensation includes payment for all work contained in the Change Order, plus all payment interruptions of schedules, extended field overhead costs, delay, and all impact, ripple effect or cumulative impact on all other work under this Agreement. The signing of the Change Order indicates that the Change Order constitutes full mutual accord and satisfaction of subcontractors, and all suppliers, as a result of the change. The Service Provider on behalf of himself, all subcontractors and all suppliers, agrees to waive all rights, without exception or reservation of any whatsoever to file any further claim related to the Change Order. No further claim or request for equitable adjustment of any type shall rise out of or as a result of this Change Order or the impact of this Change Order on the remainder of the work under this Agreement.

All terms and Conditions of the original Agreement apply to this Change Order and remain the same and in full force and effect.

Project Manager: _____ Date: _____ Department Head: _____ Date: _____

Finance: _____ Date: _____ City Manager: _____ Date: _____

Service Provider: _____ Date: _____

Upon approval, forward this document to Procurement for Amendment of Agreement.