Four Rivers
Sanitation Authority

FOUR RIVERS SANITATON AUTHORITY
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK (UST) REMOVAL AND REPLACEMENT

Date: March 29, 2024

Name of Proposing Firm: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____

Proposal Due Date and Time: 2:00 p.m., May 8, 2024

Proposals will be accepted until the specified due date and time. Any proposal delivered after the due date and time will be rejected.

PLEASE MARK THE RETURN SEALED ENVELOPE:

1. Proposal Due Date and Time
2. Title of Job
3. Proposal Number

SEND PROPOSALS TO:

Four Rivers Sanitation Authority
3501 Kishwaukee Street
Rockford, IL 61109

If the proposer chooses to hand-deliver their proposal, it must be deposited in the Bid Box in the main lobby or handed to the Customer Service receptionist of the Graceffa Administration Building, 3501 Kishwaukee Street, Rockford, IL 61109, between the hours of 8:00 A.M. and 4:00 P.M., Monday through Friday, except for holidays.

PROPOSALS WILL NOT BE ACCEPTED BY FAX OR EMAIL.

The Illinois Department of Human Rights registration number must be provided with the proposal on the proposal due date.

Proposal results are available after contracts are awarded at the Regular Meeting of the Board of Trustees, typically held on the fourth Monday of each month. Please call 815-387-7660 or visit fourrivers.illinois.gov

SECTION I
NOTICE

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

I

NOTICE
FOUR RIVERS SANITATION AUTHORITY
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

The Four Rivers Sanitation Authority will receive sealed and signed proposals for the **UNDERGROUND STORAGE TANK (UST) REMOVAL AND REPLACEMENT.** Proposals must be submitted to the Four Rivers Sanitation Authority Graceffa Administration offices located at 3501 Kishwaukee Street, Rockford, Illinois 61109 until 2:00 p.m May 8, 2024.

Copies of the RFP for review purposes only are available through the Four Rivers Sanitation Authority website fourrivers.illinois.gov. Proposal documents for submittal are available by emailing engr@fourrivers.illinois.gov or calling (815) 387-7660. For more information, visit the Four Rivers Sanitation Authority website at fourrivers.illinois.gov.

The Authority will conduct a **MANDATORY** pre-proposal meeting from 11:00 A.M to 1:00 P.M. on April 12, 2024. The meeting will begin in the Board room of the Graceffa Administration Building at 3501 Kishwaukee St., Rockford, IL 61109.

Each bid/proposal must be accompanied by cash or a certified or bank cashier's check on a solvent bank or trust company, drawn to the order of the Four Rivers Sanitation Authority, or an acceptable Bid Bond on the form attached, in an amount not less than ten percent (10%) of the total bid price. This sum is a guarantee that, if the bid is accepted, a contract will be entered into.

Four Rivers Sanitation Authority reserves the right to reject any or all proposals, or any part thereof, or to accept any or all proposals, or any part thereof, or to waive any formalities in any proposals, deemed in the best interest of the Four Rivers Sanitation Authority.

The successful respondent will be required to provide a performance bond and payment of vendor.

No proposal is to be withdrawn without the consent of the Four Rivers Sanitation Authority for sixty (60) days after the closing time of receiving the proposals.

Four Rivers Sanitation Authority will confirm any award decision in writing to the successful proposer.

Julia Scott-Valdez
Director of Management Services
Four Rivers Sanitation Authority

SECTION II
GENERAL SPECIFICATIONS AND INSTRUCTIONS

REQUEST FOR PROPOSALS #24-401

UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

II
GENERAL SPECIFICATIONS AND INSTRUCTIONS
FOUR RIVERS SANITATION AUTHORITY
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

2.1 Important Dates

- Proposal Release Date: March 29, 2024
- Mandatory Pre-Proposal Meeting: April 12, 2024, 11:00 A.M. – 1:00 P.M.
- Last day for proposers to send questions: April 24, 2024
- Last day for addenda to be issued: April 29, 2024
- Proposal Due Date: 2:00 P.M., May 8, 2024
- Anticipated Award Date: May 20, 2024

2.2 Proposal Preparation

Where applicable, the respondent must submit their proposal on the forms the Four Rivers Sanitation Authority (Authority) provides in this document. **The respondent must complete all applicable blanks**. Respondent may submit additional information as they believe necessary on their stationery, under signature of the authorized representative who completes this document's forms.

If this Request for Proposals contains inconsistencies or contradictions between sections, Section III - Detailed Specifications supersede Section II - General Specifications, which supersede Section I - Notice. **No warranty is made or implied as to information contained in these specifications.**

An authorized officer or individual must sign the proposal. The authorized signature must be the individual owner of a proprietorship, a general partner of a partnership, or the corporation officer who is authorized to sign for a firm and whose title is affixed.

All prices and notations must be in ink or typewritten. The respondent may cross out mistakes and type corrections adjacent to the point of error. The person who signs the proposal must initial such corrections, in ink. **If the Authority finds a respondent's entry to be illegible, it may, at its sole discretion, reject the proposal.**

2.3 Submission of Proposals

The Authority **will not** receive proposals in an electronic format, by e-mail or internet or by facsimile. The respondent must return their proposal, clearly marked as "**Request for Proposal #24-401: UST REMOVAL AND REPLACEMENT." The Authority cannot ensure that the sealed proposal will not be prematurely opened if the respondent does not properly label their proposal envelope.**

Proposals sent via USPS or other package delivery service should be addressed to:

Four Rivers Sanitation Authority
3501 Kishwaukee Street
Rockford, IL 61109

If the respondent chooses to hand-deliver their proposal, it must be deposited in the Bid

Box or handed to the Customer Service receptionist in the lobby of the Graceffa Administration Building, 3501 Kishwaukee Street, Rockford, IL 61109, between the hours of 8:00 A.M. and 4:00 P.M., Monday through Friday, except for holidays.

The Authority cannot represent or guarantee that any information submitted in response to the Invitation to Bid will be confidential. If the Authority receives a request for any document submitted in response to the Invitation to Bid, the Authority's sole responsibility will be to notify respondent of a request for such document to allow the respondent to seek protection from disclosure in a court of competent jurisdiction. No documentation will be provided under FOIA until the contract has been awarded.

2.4 Illinois Department of Human Rights Registration Number

All proposers, regardless of location, must provide an Illinois Department of Human Rights Registration Number with the proposal on the due date. This number must be written or typed on the line in the Fair Employment Affidavit of Compliance (included in the documents you receive). The following link may be used to access the website where the number can be obtained: https://dhr.illinois.gov/public-contracts.html

2.5 Performance Bond

The successful proposer must provide a Performance Bond acceptable to the Four Rivers Sanitation Authority. The performance bond must be for 100% of the contract price. The performance bond must be submitted annually on or before its expiration date, and within 10 business days of the award anniversary date for the entire length of the Contract period.

This Request for Proposals contains a Performance Bond form and Payment of Vendor Bond for the successful proposer's use.

If the successful proposer fails to provide acceptable bonds within the specified time they are in default.

2.6 Exceptions

Exceptions to any part of the requirements stated in this request must be clearly identified as exceptions. The stated exceptions and any alternatives offered must be included in Section 3 at the specific point at which the exception is taken (see "Proposal Response Format").

Submission of a Proposal indicates acceptance by the Proposer of the conditions contained in this Request for Proposals, unless clearly and specifically noted in the Proposal submitted and confirmed in the contract between FRSA and the Proposer selected.

2.7 Proposal Response Format

Submit three (3) hard copies of the proposal and one copy on a flash drive. Proposal format should conform to that prescribed below:

<u>Section 1</u> – Required Documents

1. Proof of required insurance (COI, additional insured endorsements)
2. Qualification Form

3. Proposal Form
4. Fair Employment Practices Affidavit of Compliance
5. Forms of Affidavit

<u>Section 2</u> – Executive Summary/Overview

Executive Summary – An executive summary detailing the Proposer's competence, qualifications, experience, and number of years providing UST REMOVAL AND REPLACEMENT as described in this RFP. The summary should explain the Proposer's understanding of the Authority's intent and objectives and how their Proposal would achieve those objectives.

<u>Section 3</u> – Main Body of Response

Include a complete copy (all pages and content) of this RFP document and Specifications document with all sections completed. A complete, point-by-point response is required; incomplete documents may be deemed unresponsive and therefore eliminated from consideration.

2.8 Taxes

This Authority is exempt, by law, from paying Federal Excise Tax and Illinois Retailers' Occupational Tax. Therefore, the respondent must exclude those taxes from their proposal. The Authority's tax exemption number is E9992-3696. The respondent must include all other applicable taxes in their proposal price.

2.9 Withdrawal of Proposals

At any time prior to the scheduled proposal deadline, the respondent may withdraw their proposal. To do so, they must submit a written request to the Authority's Director of Management Services.

2.10 Acceptance of Proposals/Form, Preparation, and Presentation of Proposals

If the proposal contains any omissions, erasures, alterations, additions or items not called for in the itemized proposal, or contains irregularities of any kind, such may constitute sufficient cause for rejection of proposal. In case of any discrepancy in the unit price or amount proposed for any item in the proposal, the unit price as expressed in figures will govern.

The Authority may reject all or part of any or all proposals, for any reason. The Authority may accept all or part of any proposal or waive any formalities if it decides such action is in the Authority's best interest.

The Authority will only consider proposals that conform to the intent of this document. The Authority will reject proposals that contain one or more exceptions if the Authority determines that non-conforming proposals deviate from the intent of these specifications. The Authority's decision is final, and the Authority's procurement procedures contain no appeal provision.

2.11 Laws and Regulations

The respondent who is awarded the contract must comply with all laws of the United States of America, the State of Illinois, and all lawful regulations of the Four Rivers

Sanitation Authority and the respective cities and villages in which the professional service and material supplied is to be performed respecting labor and compensation and all other statutes, ordinances, rules and regulations applicable and having the force of the law.

A. Illinois Regulations

1. In accordance with Illinois Public Act 102-0265, the Four Rivers Sanitation Authority is required to make a good faith effort to collect and publish certain demographic information provided by vendors and subcontractors doing business with the Authority. The Act requires FRSA to report whether a vendor or subcontractor is a minority, women, or veteran-owned business as defined by Illinois Law. In addition, the Authority is required to disclose if the business is certified as a small business under federal Small Business Administration standards. The successful proposer will be required to provide this information upon contract award.
2. Prevailing Wage - Public Act 100-1177 (820 ILCS 130) requires the proposer to comply with prevailing wages in accordance with the Illinois Department of Labor Standards. The State of Illinois requires contractors and subcontractors on Authority projects to submit certified payroll reports via the State's Certified Transcript of Payroll Portal currently found at:

   https://www2.illinois.gov/idol/Lawsrules/CONMED/Pages/certifiedtranscriptofpayroll.aspx.

   The proposer is responsible for verifying current information at the State's website.
3. Public Act 83–1030 (30 ILCS 565) entitled "Steel Products Procurement Act" requires that steel products used or supplied in performance of this contract or subcontract must be manufactured or produced in the United States with three exceptions.

   The provisions of this Section do not apply:

   a. Where the contract involves an expenditure of less than $500.
   b. Where the executive head of the public agency certifies in writing that
      i. the specified products are not manufactured or produced in the United States in sufficient quantities to meet the agency's requirements, or
      ii. obtaining the specified products, manufactured or produced in the United States would increase the cost of the contract by more than 10%.
   c. When its application is not in the public interest.
4. Public Act 96-929 (30 ILCS 570) provides that Illinois residents be employed on Illinois public works projects, provided there has been a period of excessive unemployment (5%) in the State of Illinois as defined in the Act; and, further, that Illinois workers are available and capable of performing the particular type of work involved.
5. Public Act 101-0221 requires that any party to a contract adopt and promulgate written sexual harassment policies that include, as a minimum, the following information:

a. the illegality of sexual harassment

b. the definition of sexual harassment under Illinois State law

c. a description of sexual harassment, utilizing examples

d. my (our) organization's internal complaint process including penalties

e. the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Illinois Human Rights Commission

f. directions on how to contact the Department and the Commission

g. protection against retaliation as provided by Section 6-101 of the Illinois Human Rights Act

Upon request, this information must be provided to the Illinois Department of Human Rights and Authority.

6. With regard to nondiscrimination in employment, the Contractor for this project will be required to comply with the Illinois Fair Employment Practices Commission's Rules and Regulations.
7. The Contractor for this project must comply with the Occupational Safety and Health Act.
8. The Contractor for this project must comply with the Federal Drug-Free Workplace Act.
9. Americans with Disabilities Act - The Contractor for this project will comply with all applicable requirements of the Americans with Disabilities Act of 1990 (ADA). The Contractor will hold harmless and indemnify Four Rivers Sanitation Authority (AUTHORITY) and their representatives from all:

   a) suits, claims, or actions

   b) costs, either for defense (including but not limited to reasonable attorney's fees and expert witness fees) or for settlement

   c) damages of any kind (including but not limited to actual, punitive, and compensatory damages)

   relating in any way to or arising out of the ADA, to which said firm is exposed or which it incurs in the execution of the contract.

2.12 Terms

A. Payments to the Successful Respondent. If the Authority receives an acceptable invoice for conforming services prior to the fifth day of the month, the Authority will issue payment before the fifth day of the succeeding month. If received on or after the fifth day of the month, payment will be issued the following month.

B. Default. In case of default, the Authority will procure the materials and service described in this Request for Proposal from other sources. The Authority shall hold the defaulting successful respondent responsible for any excess cost incurred. The defaulting successful respondent must make such payment no more than sixty (60) calendar days after the Authority notifies the successful respondent, in writing, of such an occurrence.

C. Delivery Hours. Unless otherwise specified, all items must be delivered to: Four Rivers Sanitation Authority, 3333 Kishwaukee Street, Rockford, Illinois, 61109, Monday through Friday, between the hours of 7:30 A.M. and 3:00 P.M., excluding holidays.

In the unlikely event that the Authority is picketed by its employees or by a third party, or if any labor-management dispute between the Authority and its employees or third parties becomes known to the successful bidder, then in such event and during the course of any such picketing or labor-management dispute, the successful bidder must continue to carry out the terms and conditions of this contract as if such pickets were not present or such labor-management dispute did not exist.

D. F.O.B. Point and Shipping Charges. All prices must be quoted F.O.B. destination, Four Rivers Sanitation Authority, 3333 Kishwaukee St., Rockford, Illinois, 61109. All shipping, handling and freight charges must be included in the proposal amount.

E. Use of Authority Name Prohibited. In the absence of the Authority's written permission, the successful respondent must not use the Authority's name in any form or medium of public advertising.

2.13 Investigation

It is the responsibility of the respondent to make any and all investigations necessary to become thoroughly informed of what is required and specified in the proposal. No plea of ignorance by the respondent of conditions that exist or that may hereafter exist as a result of failure or omission on the part of the respondent to make necessary examinations and investigations will be accepted on a basis for varying the requirements of the Authority or the compensation of the respondent.

2.14 Addenda and Interpretation

No interpretation of the meaning of the Plans, Specifications, or other Contract Documents will be made to any bidder orally. Every request for such interpretation must be in writing addressed to the Four Rivers Sanitation Authority, 3501 Kishwaukee Street, Rockford, Illinois. Any and all such interpretations and any supplemental instructions will be in the form of written addenda. To be given consideration, such requests must be received at least five (5) days prior to the proposal due date.

If the Authority issues written addenda, such addenda become part of the contract documents. Not less than three (3) business days prior to the proposal due date, the Authority will post the addenda, if any, on its website at fourrivers.illinois.gov, and distribute the addenda via email to each recipient of the specifications, at either the:

- Email address to which the Authority emailed the original RFP document; or
- Corrected email address prospective proposer furnished.

A proposer that does not receive the Authority's addenda, and who has previously submitted a proposal, is not relieved from any obligation in the proposal they submitted.

2.15 Contract Form

No more than ten (10) business days following the contract award, the successful respondent must submit a completed Contract Form to the Authority's Director of Management Services. The Contract Form is part of this Request for Proposals. By their

mutual agreement, the successful respondent and Authority may supplement this contract form or replace it with an alternative document. If the successful respondent fails to complete the agreed upon Contract Form within the specified time, they are in material default.

2.16 Contract Termination

A. Respondent's Unacceptable Performance. If the successful respondent fails to provide materials and service in conformity with this Request for Proposals, the Authority will notify them in writing. If the successful respondent fails to correct the performance deficiency to the Authority's satisfaction within five (5) working days after they receive the Authority's notice, they are in default. If the same performance deficiency recurs despite the Authority's notification and the successful respondent's temporary correction, the successful respondent is likewise in default. The Authority may, at its sole discretion, terminate the contract with the defaulting successful respondent, and remedy the matter under the provisions set forth in this Section of this Request for Proposals.

B. Authority's Action Following Contract Termination. If the contract is terminated, the Authority may, at its sole option:

1. request new proposals, or
2. designate the next-low respondent to this RFP, provided that said next-low respondent agrees to their original proposal terms.

The Authority may repeat this option until it obtains an acceptable contract.

2.17 Deliveries

The successful respondent must ship all material as follows: F.O.B. Four Rivers Sanitation Authority, 3333 Kishwaukee Street, Rockford, Illinois, 61109, freight paid by seller. All deliveries must conform to the requirements stated in this Request for Proposals.

2.18 Incidental Work

The cost of incidental work described in the Specifications for which there are no specific Contract Items is to be considered as part of the general cost of doing the work and must be included in the prices for the various Contract Items. No additional payment will be made, therefore.

2.19 Plant, Tools, and Equipment

The Contractor must provide and maintain such modern plant, tools and equipment as may be necessary to perform in a satisfactory and acceptable manner all the work required by this Contract. Only equipment of established reputation and proven efficiency must be used. The Contractor is solely responsible for the adequacy and security of their equipment.

2.20 Verification of Data

The Contractor must verify all Specifications or other data received from the Authority and must notify it of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts, or discrepancies does not relieve the Contractor of full responsibility for unsatisfactory work resulting there from nor from rectifying such

conditions at the Contractor's own expense. Contractor will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the Authority, should such errors or omissions be discovered. The Contractor must assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract.

2.21 Payment Terms
The awarded firm must submit invoices by mail to:

Four Rivers Sanitation Authority, 3501 Kishwaukee Street, Rockford, IL 61109 or by email to: accountspayable@fourrivers.illinois.gov. FRSA will make payments in the following manner: Authority's terms in Section 2.12 (A).

2.22 Purpose
The successful respondent must be an independent contractor. They must provide a fixed price for providing UST REMOVAL AND REPLACEMENT and unit prices in conformity with this request for proposals.

The intent of this solicitation is to identify an acceptable proposal that meets the minimum specifications of the project. The Authority's determination shall be final, and its procurement procedures include no method of appeal.

The Contractor shall be responsible for complying with any and all applicable laws, statutes, regulations, ordinances, permits, and directives.

2.23 Mandatory Meeting
The Authority will conduct a **MANDATORY** pre-proposal meeting **on April 12, 2024, 11:00 A.M. – 1:00 P.M.**

2.24 Proposal Evaluation

A. Evaluation Committee
A committee composed of Authority staff will review all proposals submitted based upon the Evaluation Criteria set forth below (not necessarily in order of importance).

B. Evaluation Criteria

1. Responsiveness of proposal – Proposals will be screened to ensure responsiveness to the RFP. The Authority may reject as non-responsive any proposal that does not include the documents required to be submitted by this RFP.

2. Experience and Performance – Ability to provide service demonstrated by experience and reputation with previous and current clients and firms. Proposer must demonstrate that the tank installer is certified by the tank and piping manufacturers for installation and holds all appropriate licenses.

3. Ability to Provide Services – Information on the company's ability to provide the specified services. Items considered include background of the company, responsiveness of proposal approach and resources committed to providing services, and experience of supervisory staff. Every item in the qualification form of this RFP is of high importance and will be considered heavily as the Authority

chooses the proposal judged to be the most beneficial.

4. Cost – The cost will be considered in combination with the other criteria.

5. Completion Date

2.25 Occupancy

Owner will occupy premises during entire construction period to conduct of normal operations. The Contractor shall cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

2.26 Overtime

Normal working hours are 8:00 A.M. to 4:30 P.M., Monday through Friday.

If the Contractor desires to work at a time other than normal work hours, on weekends, or on holidays, the Contractor must request permission from the OWNER's Project Manager at least 48 hours in advance of such work. Approval must be received prior to the requested work time.

A. The Contractor agrees to hold the Authority harmless against any claims arising from the project.

B. The Contractor shall be responsible for any reporting requirements specified in their permit or as required by any regulatory agency.

2.27 Payments to Successful Proposer

The successful proposer may invoice the Authority monthly. The Authority will deny invoices for any costs not included in the successful proposer's original proposal unless the successful proposer attaches Authority management's written pre-authorization for additional payment. Section 2.12 of this Request for Proposal contains the Authority's general payment requirements. The Contractor shall not raise their prices during the contract.

2.28 Questions

Interested parties may direct questions in writing concerning this Request for Proposals or for specific details to **Ed Fitzgerald at efitzgerald@fourrivers.illinois.** The Authority will not interpret specifications for individual proposers. If the Authority determines that the specifications need to be clarified or revised, it will issue an addendum to all prospective proposers.

2.29 Insurance

A. The successful respondent/contractor must, for the duration of the contract, maintain the following:

General Liability: $1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit must apply separately to this project or the general aggregate limit must be twice the required occurrence limit.

Auto Liability: $1,000,000 combined single limit per accident for bodily injury and property damage including coverages for owned, hired or non-owned vehicles, as

applicable.

Workers' Compensation and Employers' Liability: Workers' Compensation limits as required by statute and Employers' Liability limits of $500,000 per accident and $500,000 per disease.

Errors and Omissions: If the Contractor performs professional services, he shall maintain errors and omissions insurance with a limit no lower than $1,000,000 for the duration of the contract.

Umbrella: $2,000,000 per occurrence/aggregate.
The policies must contain, or be endorsed to afford Contractual Liability coverages for the following provisions in the General Liability and Automobile Liability coverages:

1. The Authority, its officers, officials, employees, and volunteers must be covered as additional insureds as respects liability arising out of activities performed by or on insured's general supervision of the successful respondent/contractor, products and completed operations of the successful respondent/contractor, premises owned, occupied or used by the successful respondent/contractor, or automobiles owned, leased, hired, or borrowed by the successful respondent/contractor. The coverage must contain no special limitations on the scope of protection afforded to the Authority, its officers, officials, employees, volunteers, or agents.

2. The successful respondent's/contractor's insurance coverage must be primary insurance as respects the Authority, its officers, officials, employees, volunteers, and agents. Any insurance or self-insurance maintained by the Authority, its officers, officials, employees, volunteers, or agents must be in excess of the successful respondent's/contractor's insurance and must not contribute with it.

3. Any failure to comply with reporting provisions of the policies must not affect coverage provided to the Authority, its officers, officials, employees, volunteers, or agents.

4. The successful respondent's/contractor's insurance must apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

B. Proof of Insurance – Certificate of Insurance and Additional Insured Endorsements. No more than ten (10) calendar days subsequent to the Authority's issuance of an award letter and no later than thirty (30) days before commencement to work, the successful respondent/contractor must provide documentation including a Certificate of Insurance and additional insured endorsements for commercial general liability and auto liability to prove that it has obtained all required insurance and bonds. The Certificate of Insurance must state Four Rivers Sanitation Authority is additional insured under the commercial general liability and automobile liability on a primary, non-contributory basis. The primary, non-contributory additional insured endorsements for commercial general liability and automobile liability must be provided. The Authority is the sole judge as to the acceptability of any such proof.

C. Correction of Successful Respondent's/Contractor's Insurance Deficiencies. If the Authority determines the successful respondent's/contractor's insurance or

documentation does not conform to the specifications, the Authority to inform said respondent/contractor of the non-conformity. If said respondent/contractor fails to provide conforming insurance or documentation within five (5) calendar days of the Authority's notice, it is in default.

D. Suitability of Insurance. The Authority is the sole judge of whether an insurer's rating is satisfactory. The Authority's decision is final and the Authority's request for proposal procedures contain no appeal provision.

E. Best Ratings.

1. Alphabetical Rating. For purposes of this Request for Proposals, "insurer" means any surety, insurance carrier, or other organization which proposes to provide an insurance policy or bond for the successful respondent/contractor. No insurer or surety rated lower than "A-," **Excellent**, in the current Best's Key Rating Guide is acceptable to the Authority.

2. Financial Size Rating. Provided an insurer's alphabetical rating is satisfactory, the Authority will examine said insurer's financial size rating.

a) If Best classifies the insurer XII or larger, said insurer is acceptable to the Authority.

b) If Best classifies the insurer as smaller than XII, but larger than VI, said insurer must be submitted to the Authority's Director of Management Services and/or the Authority's insurance consultant for review.

Financial Size ratings less than VII are not acceptable and will disqualify the respondent/contractor.

2.30 Indemnification Clause

Successful respondent/contractor must protect, indemnify, hold and save harmless and defend the Authority, its officers, officials, employees, volunteers, and agents against any and all claims, costs, causes, actions and expenses, including but not limited to attorney's fees incurred by reason of a lawsuit or claim for compensation arising in favor of any person, including the employees, officers, independent contractors, or subcontractors of the successful respondent/ contractor or Authority, on account of personal injuries or death, or damages to property occurring, growing out of, incident to, or resulting directly or indirectly from the performance by the successful respondent/contractor or subcontractor, whether such loss, damage, injury, or liability is contributed to by the negligence of the Authority or by premises themselves or any equipment thereon whether latent or patent, or from other causes whatsoever, except that the successful respondent/contractor must have no liability for damages or the costs incident thereto caused by the sole negligence of the Authority.

The indemnification must not be limited by a limitation on amount or type of damages payable by or for the successful respondent/contractor or its subcontractor under any employee benefits act including, but not limited, to the Workers' Compensation Act.

No inspection by the Authority, its employees, or agents is deemed a waiver by the Authority of full compliance with the requirements of the Contract. This indemnification

must not be limited by the required minimum insurance coverage in the Contract.

2.31 Force Majeure

The obligations of either the Authority or the successful respondent are suspended during the time as such party is prevented from complying therewith in whole or in part because of any cause, except financial, beyond the reasonable control of such party. In the event of either the Authority or the successful respondent being rendered unable wholly or in part by force majeure to carry out its obligations other than to make payments due, it is agreed that on such party giving notice and full particulars of such force majeure in writing or by facsimile to the other party as soon as possible after the occurrence of the cause relied on, then the obligations of the parties insofar as they are affected by such force majeure are suspended during the continuance of any inability so caused but for no longer period, and such cause must as far as possible be remedied with all reasonable dispatch.

End of Section

SECTION III

DETAILED SPECIFICATIONS

REQUEST FOR PROPOSALS #24-401

UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

III

DETAILED SPECIFICATIONS

REQUEST FOR PROPOSALS #24-401

UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

RFP SCOPE

The scope of this RFP involves providing all labor, tools, material, equipment and permits necessary for a complete working system:

1) The purchase and installation of a single 22,000 gallon underground (3) compartment double-walled fiberglass fuel tank* (10k/6k/6k)
    a. * See Section III, Detail Specifications, Division 33-Utilities, Section 35616 Underground Fuel Storage Tanks.
2) (1) 500 gallon aboveground Diesel Exhaust Fluid (DEF) tank and dispenser w/hose retractor
3) A 9'x16' control building (climate controlled)
4) A canopy over the fuel island (approximately 36'x48')
5) All associated site work and equipment necessary for a working system.
6) The fuel islands shall consist of:
    a. Owner purchased Assetworks fuel management system, (2) consoles, (1) on each island (Owner purchased, Contractor coordinated and installed).
    b. (2) Unleaded single hose dispensers and (2) dual hose dispensers. Each dual hose dispenser shall dispense both On-road Diesel and Off-road Diesel.
7) The removal of (3) underground fuel tanks (10k/10k/4k) and related equipment including the restoration of the site No materials or equipment to be reused.
    a. New fuel island must be installed and able to dispense fuel prior to beginning tank removal. Owner will remove all possible fuel prior to contractor beginning tank removal.
8) Any dewatering shall be included and the new tank shall be anchored by deadman furnished and installed by Contractor.

All work shall be in compliance with all Federal, State and Local laws.

Contractor shall obtain all permits and obtain any drawings necessary at Contractors expense.

Note: 1) **The following detailed specifications are the minimum required specifications. Some sections may contain items that are not applicable to this project. Any changes or substitutions must be agreed upon in writing.**

2) **Any references to "IDOT Standard Specifications" are IDOT Standard Specifications for Road and Bridge Construction, Adopted January 1, 2022 and Supplemental Specifications and recurring special provisions, adopted January 1, 2024.**

3) **The brick/block for the Control Building is to match adjacent Collection Systems Facility:**

a. **Split Face CMU: Trenwyth "Butterfield" (with Dry-Blok in CMU and Mortar)**

b. **Indiana Cast Stone "Buff"**

c. **Bowerston #85/15 Vertical Matt Modular**

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Attachments

Figure 1 – Tank Location

Figure 2 – New Fuel Island Layout

Figure 3 – Details

SECTION 017000

EXECUTION REQUIREMENTS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Section includes administrative and procedural requirements for the execution and contract closeout, including, but not limited to, the following:
   1. Starting of Mechanical Systems: Start-up of each item of equipment and system in accordance with specified procedures.
   2. Adjustments.
   3. Cleaning.
   4. Project record documents.
   5. Operating and maintenance manuals.
   6. Equipment demonstrations.
   7. Spare parts and operation/maintenance items.

1.2 GUARANTEES AND WARRANTIES

A. Assemble all guarantees and warranties thereof as required by the General Conditions and the specification sections.

B. The guarantees and warranties shall be organized into an orderly sequence based on the table of contents of the Detailed Specifications.
   1. Bind the guarantees and warranties in heavy-duty, three-ring, vinyl-covered, loose-leaf binders.
   2. Scan guarantees and warranties and assemble complete submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.

C. The guarantees and warranties shall be delivered to the Owner's Project Manager prior to final payment for the work.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 START-UP PROCEDURES

A. System Start-up

1. Coordinate schedule for start-up of various equipment and systems.
2. Notify Owner's Project Manager seven days prior to start-up of each item.
3. Verify that each piece of equipment or system has been checked for proper lubrication, rotation, tension, control sequence, and conditions that may cause damage.
4. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
5. Verify that wiring and support components for equipment are complete and tested.
6. Execute start-up under supervision of applicable Contractor personnel and manufacturers' representative(s) in accordance with manufacturers' instructions.
7. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
8. Submit a written report that equipment or system has been properly installed and is functioning correctly.

B. Motors:
1. Check each motor for amperage comparison to nameplate value.
2. Correct conditions which produce excessive current flow and which exist due to equipment malfunction.

C. Pumps:
1. Check mechanical seals for cleanliness and adjustment before running pump.
2. Inspect shaft sleeves for scoring.
3. Inspect mechanical faces, chambers, and seal rings. Replace if defective.
4. Verify that piping system is free of dirt and scale before circulating liquid through pump.

D. Control Valves:
1. Inspect both manual and automatic control valves and clean bonnets and stems.
2. Tighten packing glands to ensure no leakage but permit valve stems to operate without galling.
3. Replace packing in valves to retain maximum adjustment after system is complete.
4. Replace packing on any valve that continues to leak.
5. Remove and repair leaking bonnets.
6. Verify that control valve seats are free from foreign material and are properly positioned for intended service.

E. Tighten flanges after system has been placed in operation.
   1. Replace flange gaskets showing signs of leakage after tightening.

F. After system has been placed in operation, clean strainers, dirt pockets, orifices, valve seats, and headers in fluid systems to ensure system is free of foreign materials.

G. Remove rust, scale, and foreign materials from equipment and renew defaced surfaces.

H. Inspect fan wheels for clearance and balance.

I. Check each electrical control circuit to ensure that operation complies with specifications and requirements for intended performance.

J. Repair damaged insulation.

K. Vent gases trapped in any part of systems. Verify that liquids are drained from all parts of gas or air systems.

L. Use a leak detector compound to check piping for leaks at every joint and at every threaded, flanged, or welded connection. Promptly remake each joint and connection that appears to be faulty.

3.2 ADJUSTMENTS

A. Provide such periodic continuing adjustment services as necessary to ensure proper functioning of mechanical systems after occupancy of the work and for a period of one year from the date of full completion of the work.

3.3 CLEANING

A. Prior to a final inspection and acceptance of the work, remove all debris, rubbish, waste material, tools, construction equipment, machinery, and surplus materials from the project site and thoroughly clean the building, including the removal of all dirt, dust, labels, marks, smears, spots, grease, and stains from all floors, walls, ceilings, steel, piping, fixtures, equipment, hardware, glass, mirrors, and all finish surfaces. In addition, provide any special cleaning required by the specification sections.

3.4 PROJECT RECORD DOCUMENTS

A. During the progress of the work, maintain one set of drawings at the project site for preparing record drawings. Include the designation “PROJECT RECORD DRAWING” in a prominent location on each drawing. Using an erasable, red-colored pencil, neatly record all changes in the work and record specific locations of work shown schematically on the drawings. Locations must have at a minimum the following information:

1. Invert elevations below finish grade for domestic and sanitary sewers and manholes.
2. Top of water lines, both domestic and fire, below finish grades.
3. Locations of cathodic protection (anodes).
4. Locations of bends, tees, valves, caps.
5. All locations must be indicated from a permanent building structure (e.g. corner of building, office complex corner).

B. All underground items or items enclosed in walls must be documented before being enclosed. If items are buried or enclosed before documentation, Contractor will open and reinstall at his/her own expense. In addition, record the following on mechanical and electrical drawings:
   1. Size, type, and capacity of each device or piece of equipment.
   2. Location of each device or piece of equipment.
   3. Location of each source or outlet in building service systems.
   4. Location of concealed water and electrical services, water piping, sewers, wastes, vents, ducts, conduit, and other piping by indication of measured dimensions to such line from readily identifiable and accessible walls or corners of buildings.
   5. Invert elevations of sewers and top of water lines.

C. Submit the record drawings to Owner's Project Manager for approval prior to a final inspection and acceptance of the work. If Owner's Project Manager determines that the drawings are incomplete or incorrect in any way, he/she shall advise Contractor of the required corrections and Contractor shall promptly submit corrected drawings.

D. Approved record drawings will be returned to Contractor and Contractor shall neatly record the information on a set of drawings furnished by Owner. The final set of record documents shall be delivered to Owner's Project Manager prior to final payment for the work. Organize record prints into two manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

E. Contractor shall also submit the approved record drawings as PDF electronic files on a USB thumb drive or other approved electronic media.

3.5 PROJECT RECORD PROJECT MANUAL

A. During the progress of the work, maintain one set of the Project Manual at the project site for preparing record Project Manual. Include the designation "PROJECT RECORD MANUAL" in a prominent location on the document. Using an erasable, red-colored pencil, neatly record all changes in the specifications and to indicate the actual product installation.
   1. Mark copy with proprietary name and model number of products, materials, and equipment furnished, including product options selected.

2. Record the name of manufacturer, supplier, installer, and other information necessary to provide a record of selections made.

3.6 OPERATING AND MAINTENANCE MANUALS

A. Prepare three complete sets of manuals containing the manufacturer's instructions for operation and maintenance of each item of equipment, apparatus, and operational system furnished under the Contract and any additional data specifically required in the specification sections.

B. Manuals will include the following:
   1. Complete instructions regarding operation, service, and maintenance, including lubrication, disassembly, and reassembly.
   2. Complete nomenclature of all parts and part numbers of all replaceable parts.
   3. Complete list of sources to be contacted for service and replacement parts including names, addresses, and all other pertinent data regarding procurement procedure.
   4. Copy of all required guarantees and warranties.
   5. Manufacturers' bulletins, cuts, and descriptive data 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. An electronic file for all O&M information in this section.

3.7 EQUIPMENT DEMONSTRATIONS

A. Give physical demonstrations and oral instructions for the operation of equipment, apparatus, and operational systems furnished under the Contract.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Provide a qualified person knowledgeable about the Project to perform demonstration and instruction of owner personnel.

E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with owner's personnel in detail to explain all aspects of operation and maintenance.

F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

3.8 SPARE PARTS AND OPERATION/MAINTENANCE ITEMS

A. All spare parts and operation/maintenance items required by the specification sections shall be delivered to the Owner's Project Manager prior to final payment for the work. Label with manufacturer's name and model number and Section number where applicable.

END OF SECTION

SECTION 024100

DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Building and Site Demolition:
   1. Demolition of designated building structures.
   2. Demolition of site improvements including paving, curbing, site walls, and utility structures.
   3. Demolition of below-grade foundations and site improvements to depth to avoid conflict with new construction or site work.
   4. Removal of hollow items or items that could collapse.
   5. Protection of site work and adjacent structures.
   6. Disconnection, capping, and removal of utilities.
   7. Pollution control during building demolition, including noise control.
   8. Salvaging items noted to be salvaged.
   9. Removal and legal disposal of materials.

B. Selective Demolition:
   1. Selective demolition of interior partitions, systems, and building components designated to be removed.
   2. Selective demolition of exterior facade, structures, and components designated to be removed.
   3. Protection of portions of building adjacent to or affected by selective demolition.
   4. Removal of abandoned utilities and wiring systems.
   5. Notification to Owner of schedule of the shut off of utilities serving occupied spaces.
   6. Pollution control during selective demolition, including noise control.
   7. Salvaging items noted to be reused by Owner only or salvaged.
   8. Removal and legal disposal of materials

C. Special Removal Work:
   1. Removal of hazardous materials.
   2. Removal of underground fuel tanks in accordance with API 1604.
   3. Removal and abatement of lead paint.

1.2 RELATED SECTIONS

A. Section 311000 - Site Clearing

1.3 SUBMITTALS

A. Permit for transport and disposal of debris

B. Demolition procedures and operation sequences for review and acceptance by Owner.

1.4 QUALITY ASSURANCE

A. Comply with governing codes and regulations.

B. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

C. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; current edition.

D. Demolition Firm Qualifications: Company specializing in the type of work required.

1. Minimum of 5 years of documented experience.

1.5 PROJECT CONDITIONS

A. Adjacent areas may be occupied by Owner's personnel. Do not interrupt Owner's use of adjacent facilities. Refer to drawings for specific site conditions.

1.6 PHASING

A. The new fuel island shall be complete, operational, and accepted by the Owner before demolition of the existing fuel facility is initiated. Coordinate with Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Immediately remove from site all demolished material not being reused.

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.
2. Comply with applicable requirements of NFPA 241.
3. Take precautions to prevent collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

B. If unidentified hazardous materials are discovered during removal operations, stop work and notify Owner's Project Manager immediately; hazardous

materials include, but are not limited to, regulated asbestos-containing materials, lead, PCBs, mercury, and petroleum products.

C. See Section 311000 – Site Clearing – for additional requirements pertaining to demolition of sitework and vegetation.

3.2 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with utility company requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from the authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems currently in use without at least seven days' prior written notification to Owner's Project Manager.

E. Do not close, shut off, or disrupt existing utility branches or take-offs currently in use without at least three days prior written notification to Owner's Project Manager.

F. Locate and mark all utilities to remain and those to be removed; mark using highly visible tags or flags with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Where conduit is to remain and where conductor is to be disconnected, remove all conductors to electrical panel.

I. Do not interrupt utilities serving occupied or used facilities without the written permission of the Owner and authorities having jurisdiction. If necessary, provide temporary utilities.

3.3 DEMOLITION

A. Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.

B. Verify that utilities have been disconnected and capped before starting demolition activities.

C. Do not damage building elements and improvements indicated to remain. Items of salvage value not included on schedule of salvage items to be returned to Owner shall be removed from structure. Storage or sale of items at project site is prohibited.

D. Salvaged items to be returned to owner or reused shall be stored in a secure area and protected until reinstalled or returned to owner.

E. Perform an engineering survey of the condition of the building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

F. Do not close or obstruct streets, walks, drives, or other occupied or used spaces or facilities without the written permission of the Owner and the authorities having jurisdiction.

G. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.

H. Provide adequate protection against accidental trespassing. Secure project after work hours.

I. Promptly repair damage to adjacent buildings, and other structure improvement systems caused by demolition operations.

J. Unless otherwise indicated, demolition waste becomes property of Contractor.

K. Instructions for special demolition work.

L. Repair demolition performed in excess of that required.

M. Do not burn materials on site.

N. Pollution Controls: Comply with governing regulations for environmental protection.

    1. Use water sprinkling, temporary enclosures, and other suitable methods to limit amount of dust and dirt rising and scattering in air.
    2. Provide hoses and water main or hydrant connections.
    3. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

O. Break up and remove concrete slabs-on-grade, unless otherwise indicated to remain.

P. Filling Voids:

    1. Completely fill below-grade areas and voids resulting from demolition of structures.
    2. Use soil materials consisting of stone, gravel, and sand; free from debris, trash, frozen materials, roots and other organic matter, and stones larger than 2 inches.

3. Prior to placement of fill materials, ensure that areas to be filled are free of standing water, frost, frozen material, trash, and debris.
4. Place fill materials in horizontal layers not exceeding 6 inches loose depth.
5. Compact each layer at optimum moisture content of fill material to density equal to original adjacent ground, unless subsequent excavation for new work is required.
6. After fill placement and compaction, grade surface to meet adjacent contours and provide flow to surface drainage structures.

3.4 SCHEDULE

A. Items for Protection during Demolition and Construction:
   1. Designated site improvements, trees, and plantings.
   2. Adjacent construction.
   3. Pavement

B. Items to Be Salvaged for Reinstallation:
   1. None

C. Items to Be Salvaged for Delivery to Owner:
   1. None

D. Utilities Requiring Interruption, Capping, or Removal:
   1. Electric
   2. Water
   3. Gas
   4. Sewerage
   5. Telephone
   6. Storm Drainage

3.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
   1. Pavement

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that the existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

3.6 DISPOSAL AND REMOVAL

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property, unless otherwise directed by Owner.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store without intermixing with other materials and transport recyclable materials to recycling facilities. Do not interfere with other Project work.

C. Open burning will not be permitted.

END OF SECTION

SECTION 026500

UNDERGROUND STORAGE TANK DEMOLITION

Note – Demoliton of the existing fuel island cannot begin until the new fuel island is fully operational and able to dispense fuel.

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This Section includes requirements and specifications pertaining to:
   1. Site Health and Safety Plan
   2. Laboratory and field testing
   3. Tank Cleaning and Inspection
   4. Excavation and Backfill
   5. Tank and piping removal and disposal

1.2 RELATED SECTIONS

A. Section 017000 – Execution Requirements
B. Section 024100 – Demolition
C. Section 313000 – Earthwork

1.3 SUBMITTALS

A. Site Safety and Health Plan: Describe safety and health plan and procedures as related to underground tank removal and pipe removal, and as related to operations associated with petroleum contaminated soils and water.
B. Excavation and Material Handling Plan: Describe methods, means, equipment, sequence of operations and schedule to be employed in excavation, transport, handling, and stockpiling of soil during underground tank removal.
   1. Submit to Owner's Project Manager fifteen days before beginning tank removal work.
   2. Include a material handling plan that describes phases of dealing with the contaminated soil and water as it relates to the proposed tank and piping removal.
   3. Include methods of excavating, a material handling plan for the contaminated material, soil testing requirements, safety precautions and requirements, and water pumping and collection requirements.
C. Field Sampling and Laboratory Testing Plan: Describe field sampling methods and quality control procedures.

1. Identify laboratory and laboratory methods to be used for contamination testing.
2. Sample reports shall show sample identification for location, date, time, sample method, contamination level, name of individual sampler, identification of laboratory, and quality control procedures.

D. Tank and Piping Removal and Disposal Plan: Describe methods, means, sequence of operations, and schedule to be employed in the testing, pumping, cleaning, de-vaporizing, inspecting, removal, and disposal of underground storage tanks and piping.

E. Spill and Discharge Control Plan: Describe procedures and plan related to potential spills and discharge of contaminated soils and water.

F. Reports:
1. Identification of tanks removed and disposed of, including site map showing location of tank and piping.
2. Starting and ending dates of reporting period.
3. Closure report. Incorporate reports, records, and data into a single binder with the title "SITE ASSESSMENT REPORT" on the cover of the binder.
4. Laboratory testing reports, including location of soil excavated and associated OVA/FID (organic vapor analyzer/flame ionization device) readings, and sampling and test results for:
   a. TPH (total petroleum hydrocarbons).
   b. BTEX (benzene, toluene, ethylbenzene, and xylene).
   c. TCLP (toxicity characteristic leaching procedure); if BTEX indicates gasoline, then provide TCLP.
5. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with local, state, and federal regulations and 40 CFR 280.

B. Qualifications: Prior to start of work, submit documentation of recent experience and resumes of personnel working on the project.
1. Data shall indicate that tank removal contractor, subcontractors, and personnel employed on the project have been engaged in removal, transportation, and disposal of underground tanks and associated piping, are familiar with and shall abide with the following:
   a. API RP 1604.
   b. 40 CFR 280 and State and local regulations and procedures.
   c. Applicable safety rules and regulations.

d. Use of equipment and procedures for testing and vapor-freeing tanks.

e. Handling and disposal of types of wastes encountered in underground tank and pipe removal including disposal of underground tanks and associated piping.

f. Excavation, testing, and disposal of petroleum contaminated soils, liquids, and sludge.

g. If project location requires, provide documentation that tank removers are certified if locality of project has this requirement.

2. Furnish the name and qualifications of the proposed Site Safety and Health Officer, including education, training, and work experience.

C. References: Furnish data proving experience on at least three prior projects that included types of activities similar to those in this project. Provide project titles, dates of projects, owners of projects, point of contact for each project, and phone numbers of each point of contact.

1.5 REFERENCE STANDARDS

A. API RP 1604 – Closure of Underground Petroleum Storage Tanks; American Petroleum Institute; current edition.

B. API PUBL 1628 – Guide to the Assessment and Remediation of Underground Petroleum Releases; American Petroleum Institute; 1996.

C. ASTM D 1586 - Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils; current edition.

D. ASTM D 4397 – Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; current edition.

E. 29 CFR 1910 – Occupational Safety and Health Standards; Code of Federal Regulations; current edition.

F. 29 CFR 1910.38 – Emergency action plans; Occupational Safety and Health Standards; Code of Federal Regulations; current edition.

G. 29 CFR 1910.134 – Respiratory protection; Occupational Safety and Health Standards; Code of Federal Regulations; current edition.

H. 29 CFR 1926.650 – Excavations; occupational Safety and Health Standards; code of Federal Regulations; current edition

I. 40 CFR 280 – Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks; Code of Federal Regulations; current edition.

J. COE EM-385-1-1 – Safety and Health Requirements Manual; Corps of Engineers; current edition.

K. EPA SW-846.3.3B – Test Methods for Evaluating Solid Waste: Physical/Chemical Methods; Environmental Protection Agency; current edition. EPA 600-4-790-20 – Methods for Chemical Analysis of Water and Wastes; Environmental Protection Agency; current edition.

1.6 RECORD DOCUMENTS

A. Building permit, inspection permits, and other permits required for underground tank removal.

B. Results of excavation, including sketch showing location of underground storage tank, sampling locations, and extent of excavation.

C. Tank disposal paperwork, such as copy of UST Notification Form and method of conditioning tank for disposal.

D. Contaminated soil disposal paperwork, such as laboratory testing reports.

E. Contaminated water disposal paperwork, such as laboratory testing results.

1.7 PROJECT CONDITIONS

A. Do not close, block or otherwise obstruct roadways or walks.

B. Maintain flashing barriers around open excavations.

C. The Contractor shall be responsible for the protection of all existing structures against hydraulic uplift until the removal of the USTs has been completed.

1.8 UNIT PRICES

A. Replace and dispose of petroleum contaminated soil materials encountered during the excavation, shall be considered additional work to that indicated on or reasonably inferred by the contract documents.

B. Vacuuming and disposal of sludge and tank rinse effluent collected during tank cleaning, and vacuuming and disposal of free product or contaminated water encountered during excavation, shall be considered additional work to that indicated on or reasonably inferred by the Contract Documents.

C. Replacement of self-compacting rock to top of water level in tank excavation as directed by Owner's Project Manager in the situations where high ground water exists, shall be considered additional work to that indicated on or reasonably inferred by the contract Documents.

D. Additional work, as determined by the Owner's Project Manager shall, by appropriate change order, be charged to the Owner and the cost to the Owner shall be determined in the manner provided in the General Conditions.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Plastic Sheeting: ASTM D 4397.

PART 3 – EXECUTION

3.1 PREPARATION

A. Provide shoring, bracing, or support to prevent movement, settlement or collapse of adjacent construction. If it is determined sheet piling is necessary to protect adjacent structures, at least one Standard Penetration Test (SPT) should be conducted in accordance with ASTM D 1586 to a minimum depth of 20 ft. in the immediate UST area prior to sheet pile installation as a means of determining site specific soil characteristics and water table depth. In conducting the SPT, hand auguring to a minimum depth of 5 ft. at the SPT location should be performed in order to avoid damage to possible underground utilities. The SPT results should be provided to the sheet pile installation contractor for effective design of the sheet piling system. To afford adequate time for sheet pile system design, the STP should be conducted at least one week prior to commencement of site work.

B. Locate, identify, disconnect, remove or cap/plug utility services within demolition areas not indicated to remain or re-install.

   1. Mark location of disconnected utilities. Indicate capping/plugging locations on Project Record Documents.

C. Provide all required notification to authorities having jurisdiction over the work. Notification is typically required at least 48 hours (two working days) prior to commencing site work, but should be verified on a site-specific basis.

D. Remove fuel dispensers, lighting, etc. from fuel island; remove submersible turbine pumps (STPs) from USTs, if so equipped.

E. Purge all petroleum product piping by blowing-back to the USTs with the use of compressed nitrogen. Following purging, double-rinse the product piping with the use of a degreasing solution. During purging, the rinseate solution should be directed back toward the USTs.

F. Pump residual liquids from the USTs using explosion proof pumps.

G. Clean USTs in-place with the use of degreasing solution. Note: Cleaning in-place will require a minimum of two openings of minimum four-inch diameter, each at opposite ends of the UST. If the UST is not equipped with these openings, proceed to demolition, as described in Section 3.2.

H. Site Safety and Health Plan (SSHP): Furnish safety, health, and accident prevention provisions and develop a Site Safety and Health Plan (SSHP).

1. The SSHP shall incorporate the requirements of 29 CFR 1910 and COE EM-385-1-1.
2. Site work shall not start until the SSHP is approved by the Owner's Project Manager.

I. Site Safety and Health Officer: Identify an individual to serve as the Site Safety and Health Officer (SSHO) who is a Certified Industrial Hygienist (CIH).
1. The SSHO CIH shall report problems and concerns regarding health and safety to the Owner's Project Manager.
2. The SSHO CIH shall have a working knowledge of local and Federal occupational safety and health regulations, and shall provide training to Contractor's employees in air monitoring practices and techniques.
3. The SSHO CIH shall also provide day to day industrial hygiene support, including air monitoring, training, and daily site safety inspections.
4. The SSHO CIH shall be trained in the use of the monitoring and sampling equipment, interpretation of data required to implement the SSHP, and to administer the elements of the SSHP.
5. The SSHO CIH shall remain on site during project operations and may be assigned other duties such as project foreman or quality control manager.

J. Spill and Discharge Control Plan: Develop, implement, and maintain a comprehensive spill and discharge control plan.
1. The plan shall provide contingency measures for potential spills and discharges from handling and transportation of contaminated soils and water.
2. A possible source of guidance for assessment and remediation is API PUBL 1628.

K. Exclusion Zone (EZ) And Contamination Reduction Zone (CRZ): Do not permit personnel not directly involved with the project to enter work zones, called the EZ and CRZ.
1. The EZ shall be an area around the tank a minimum of 10 feet (3 m) from the limits of the tank excavation.
2. At the perimeter of the EZ, establish a CRZ.
3. Within the CRZ, equipment and personnel shall be cleaned as stated in the paragraph entitled "Personnel and Equipment Decontamination."
4. The Contractor's site office, parking area, and other support facilities shall be located outside the EZ and CRZ.
5. Clearly mark and post the boundaries of the EZ and CRZ.
6. Include a site map, outlining the extent of work zones and location of support facilities, in the SSHP.

L. Training: Provide health and safety training in accordance with 29 CFR 1910 prior to starting work.

1. Furnish copies of current training certification statements for personnel prior to initial entry into the work site.
2. On-Site Training: Prior to starting on-site work, a health and safety training class shall be held by the SSHO CIH to discuss the implementation of the SSHP.
3. Notify the Owner's Project Manager 24 hours prior to beginning the training class.
4. Training Outline: Provide the following:
    a. Health and safety organization, including discussion of distribution of functions and responsibilities
    b. Organization and components of the SSHP
    c. Physical and chemical site hazard identification
    d. Basic toxicology and toxicity information
    e. Discussion of the EZ and CRZ
    f. Protective clothing
    g. Respiratory protection
    h. Air quality monitoring
    i. Personnel exposure guidelines
    j. Decontamination procedures
    k. Basic first aid review
    l. Emergency procedures and contingency plan
    m. Site entry and exit procedures
    n. Sampling procedures

M. Personnel Protection: Furnish appropriate personal safety equipment and protective clothing to personnel.
    1. Ensure that safety equipment and protective clothing is kept clean and well maintained.
    2. Furnish three clean sets of personal protective equipment and clothing for use by the Owner's Project Manager or official visitors as required for entry into the EZ.

N. Respiratory Protection Program: Develop a respiratory protection program, addressing respirator usage and training, in accordance with 29 CFR 1910.134 and COE EM-385-1-1.

O. Decontamination: Decontaminate or properly dispose of personal protective equipment and clothing worn in contaminated areas at the end of the work day.
    1. The SSHO CIH shall be responsible for ensuring that personal protective clothing and equipment are decontaminated before being reissued.

P. First Aid and Emergency Response Equipment and Procedures: Provide appropriate emergency first aid equipment for treatment of exposure to site physical and chemical hazards.
    1. Provide and post a list of emergency phone numbers and points of contact for fire, hospital, police, ambulance, and other necessary contacts.
    2. Provide and post a route map detailing the directions to the nearest medical facility.

Q. Ignition Sources: Do not permit ignition sources in the EZ and CRZ.

R. Personnel and Equipment Decontamination: Decontaminate personnel and equipment before exiting the work zones.

S. Waste Disposal: The SSHP shall detail the practices and procedures to be utilized to dispose of wastes. Upon completion of the project, certify that equipment and materials were properly decontaminated prior to being removed from the site.

T. Emergency Response Requirements: Furnish emergency response and contingency plan in accordance with 29 CFR 1910.38.
    1. In an emergency, take action to remove or minimize the cause of the emergency, alert the Owner's Project Manager, and institute necessary measures to prevent repetition of the emergency.
    2. Equip site-support vehicles with route maps providing directions to the medical treatment facility.

U. Unforeseen Hazards: Notify the Owner's Project Manager of any unforeseen hazard or condition that becomes evident during work.

3.2 DEMOLITION

A. Use demolition methods that will not crack, structurally disturb or otherwise damage adjacent construction. Do not use explosives. If sheet piling is required for adequate protection of adjacent construction see Section 3.1 (A).

B. Remove the following materials, equipment, and fixtures, and promptly dispose of offsite in compliance with all applicable laws:
    1. All paving and base course indicated. Sawcut asphalt full depth and concrete 1/2 depth for areas where pavement is indicated to be replaced.
    2. Underground storage tank piping, pipe fittings and valves, dispenser(s), fuel island form(s), pipe bumpers, hold down slab or deadmen as indicated. Do not remove the tank vent piping until the tank atmosphere is non-explosive.
    3. Electrical conduit and fittings, wires, boxes, wiring devices and supporting devices indicated.
    4. Lighting luminaries (fixtures) indicated.

C. Remove underground fuel storage tanks and piping indicated to be taken out of service. Note: It is the contractor's responsibility to be aware of site limitations and provide adequate heavy equipment for the removal of the underground tanks.
    1. Excavate to the top of the tank. Excavated material shall be temporarily stockpiled atop visquene, bermed, and covered with visquene pending test results for excessive contamination.
    2. Disconnect and cap all piping indicated to remain in place. Adequate means of access and egress shall be provided for personnel required to enter excavated site.
    3. Remove all tank fixtures except the tank vent. Temporarily plug all but one of the tank openings.
    4. Use one of the following methods to render the atmosphere of the tank non-explosive
        a. Remove tank vapors by means of an eductor or diffused air blower as described in API 1604.
        b. Purge the tank of oxygen by introducing an inert gas as described in API 1604.
    5. Use 1.5 pounds of solid carbon dioxide (dry ice) per 100 gallons of tank volume. Dry ice should be obtained in "pellet" form to enable placement into UST fittings.
        a. Use a combustible gas indicator (explosimeter) calibrated according to the manufacturer's instructions, and monitor the area of the tank excavation each hour until the tank is removed.
    6. Test the tank for vapors by removing a tank fitting and using the explosimeter to test the lower, middle, and upper portions of the tank. Clear the instrument after each reading. When the explosimeter indicates the atmosphere within the tank is less than 10% of the lower explosive limit (LEL) remove the tank from the ground.
    7. Complete the vapor removal process and plug all tank fittings. Install one tank fitting with a 1/8-inch hole to relieve the differential pressure that will develop during the tank removal.
    8. Complete excavation and remove the tank from the hole. Chock the tank to allow cleaning to be done, and examine for perforations. Repair perforations that would allow leaks of cleaning effluent.
    9. If required, repeat the purging process before cleaning the tanks. Test the upper middle and bottom of the tank with an explosimeter. When the explosimeter indicates the atmosphere within the tank is less than 10% of the lower explosive limit (LEL) cut a hole in the tank using a pneumatic hammer.
    10. Clean the inside of the tank, as per the recommendations contained in API 2015, to remove sludge and refuse that would create a vapor hazard if not

removed. Dispose of sludge, tank rinse effluent, and all other materials used to clean the inside of the tank in compliance with all applicable laws. Provide manifest(s) to Owner for all contaminated materials transported off site. Manifest(s) shall: indicate the type of product; volume collected; origin address; transporter's name, address, and license information; disposal facility's name, address, and license information; and dates of transactions.

11. Steel tanks shall be rendered useless by ripping the length of the tank open or drilling a 1/2-inch hole every three feet on both sides of the tank prior to transporting off site. Fiberglass tanks shall be crushed.
12. Transport the tank in compliance with all applicable laws, including federal and state Department of Transportation regulations.
13. Dispose of the tank in compliance with all applicable laws at a facility where the tank will be destroyed as scrap. Secure certification, signed by the Contractor and the scrap facility owner for the transaction and provide a copy to the Owner.
14. Remove free product, if encountered floating on the water of the excavation to mitigate explosion hazard.
15. Remove the hold down slab or deadmen indicated.
16. Completely fill below grade areas and voids resulting from demolition work with existing self-compacting rock (pea gravel) to the top of the water level in the tank excavation. Above the water level native soils shall be used. If additional rock material is required, it shall be charged to the Owner by appropriate change order, and the cost to the Owner shall be determined in the manner provided in the General Conditions.

3.3 PROTECTION

A. Provide temporary flashing barricades around demolition work in progress. Clearly identify demolition work areas with signs indicating demolition work in progress. Erect "NO SMOKING" signs during tank removal, cleaning and demolition processes. Keep area clear of all unauthorized personnel.

B. Protect existing construction, materials, equipment and fixtures against damage, unless indicated to be removed and disposed of.

C. Maintain existing utilities indicated to remain or keep in service, and protect against damage.

D. Promptly repair or replace damaged or disturbed construction, materials, equipment and fixtures resulting from demolition work. Repair or replace in a manner acceptable to Owner’s Project Manager, at no cost to Owner.

E. Correct demolition performed in excess of that indicated in a manner acceptable to Owner’s Project Manager, at no cost to Owner.

3.4 TESTING

A. Testing of soils or groundwater required by the agency having jurisdiction over the work shall be performed by the Owner.
   1. Stockpiled Soils: Soils with OVA/FID readings of 10 ppm or greater shall be further sampled and tested.
   2. Test for TPH and for BTEX in accordance with EPA SW-846-3-3B and EPA6004-790-20.
   3. Test for toxicity characteristic leaching procedure (TCLP) for lead if leaded gasoline was stored in or near the underground tank being removed.
   4. For TPH, provide a minimum of one test for every 100 cubic yards.
   5. For BTEX and TCLP, provide one test for every 100 cubic yards.
   6. Soils that contain 50 ppm or more TPH, 10 ppm or more BTEX or have TCLP reading of 10 ppm lead or virgin petroleum products are considered contaminated materials.
   7. Soils that test at levels less than the above may be used as clean fill.
   8. Furnish results to Owner's Project Manager within 24 hours after the results are obtained.

B. Testing Under Tank After Removal of Tank:
   1. If tank is 20 feet or less in length, take two samples. Each sample shall be two feet from each end of the tank and two feet below the bottom of the excavation.
   2. If the tank is greater than 20 feet, take three samples. Two samples shall be two feet from each end of the tank and two feet below the bottom of the excavation. A third sample shall be taken from the middle of the tank area and 2 feet below the bottom of the excavation. If personnel are required to enter excavated area, they must be protected from hazardous environments; such as water, hazardous vapors, depleted oxygen levels, etc.
   3. Analyze samples for TPH, BTEX, and TCLP.
   4. Conform to standards for sampling and analysis as specified above for stockpiled soils.
   5. Test for TPH and for BTEX in accordance with EPA SW-846-3-3B and EPA6004-790-20.
   6. Soils that contain 50 ppm or more TPH, 10 ppm or more BTEX, or have TCLP reading of 10 ppm of lead or virgin petroleum products are considered contaminated materials.
   7. Soils that test at levels less than the above may be used as clean fill.
   8. Furnish results to Owner's Project Manager within 24 hours after the results are obtained.

9. Along with the results furnish a sketch showing underground tank, sampling location, and extent of excavations.

C. Testing Along Piping:
   1. For every 25 linear feet (7.5 m) of product delivery piping, for every change in direction, and at every mechanical joint take one soil sample and analyze for TPH, BTEX, and TCLP.
   2. Conform to sampling and analysis of soil materials as specified above in Section 3.4.B, paragraph entitled "Testing Under Tank After Removal of Tank."

3.5 TANK CLEANING

A. Provide clean and vapor free tank in accordance with API RP 1604 and the following Table of Tank History:

B. Fuel Removal:
   1. All possible fuel will be pumped or otherwise removed from the tank by Owner.
   2. Consider remaining fuel contaminated or waste fuel; pump into 55-gallon drums or other suitable containers for disposal in accordance with approved procedures meeting local, state, and federal regulations.
      a. Drums or tanks used for containerizing waste fuel shall be furnished by Contractor.
   3. Consider remaining fuel contaminated or waste fuel; provide oil/water separators for further recovery of fuels and turn over to Owner for use.
      a. Oil/water separator for fuel shall be furnished by Contractor.
   4. Dispose of remaining fuel emulsions in accordance with applicable local, state, and federal regulations.

3.6 EXCAVATION

A. Provide Owner's Project Manager with written documentation no later than 30 days before work begins that proper state or local authorities have been notified.

B. Notify Owner's Project Manager at least 48 hours prior to start of tank removal work.
   1. Stage operations to minimize the time that tank excavation is open and the time that contaminated soil is exposed to the weather.
   2. Provide protection measures around the excavation area to prevent water runoff and to contain the soil within the excavation area.

C. Excavation: Excavate as required to remove tanks and piping.
   1. Place soil removed from the excavation in a temporary containment area.

2. Collect and temporarily store water runoff from stockpiled soils.
3. Contaminated soil materials may be used as backfill for tank and pipe excavations as follows:
    a. To determine soil contamination levels, continuously monitor soil materials excavated to remove tanks with an OVA/FID capable of detecting volatile organic vapors to a minimum of one ppm.
    b. Contaminated soils with OVA/FID readings of 10 ppm or greater shall be further tested for TPH and BTEX as specified herein.
    c. Soils with OVA/FID readings less than 10 ppm may be used as clean backfill.
    d. Dispose of unacceptably contaminated soils in accordance with federal, state, and local regulations.

D. Excavation Methods: Select methods and equipment to remove soil to minimize disturbance to areas beyond the limits of the excavation area.
1. Material that becomes contaminated as a result of Contractor's operations shall be removed and disposed of at no additional cost to Owner.
2. Where excavation extends into groundwater levels, dewatering methods shall be employed on a localized basis to facilitate excavation operations, as specified in Section 017000 – Execution Requirements.
3. Water generated by dewatering during excavation required for removal of tanks or piping, surface water collected in open excavation, or water used for washing equipment or existing concrete or bituminous surfaces, shall be collected and tested.
    a. Test in accordance with EPA SW-846-3-3B and EPA6004-790-20 and state or locally required analyses.
    b. Water that contains contaminants above locally acceptable levels shall be disposed of in accordance with federal, state, and local regulations.
    c. Non-contaminated water may be disposed of on-site.
4. Prevent cave-ins of the excavation site, following 29CFR 126.650 by
    a. Sloping or benching sides
    b. Supporting sides
    c. Placing a shield between the side and work area
    d. Excavations should be inspected daily for signs of cave-ins, failures of protective systems or equipment, hazardous atmosphere, etc.

E. Structures: During excavation activities, if asphalt pavement, concrete slabs, or other structures are encountered, remove and wash with high pressure water cleaning equipment.
1. Remove and dispose of pavement, concrete, and other structures as specified in Section 024100 – Demolition.

3.7 WATER DISPOSAL

A. Dewatering will be permitted only with approval of Owner's Project Manager.

B. Store and test water generated during removal of tanks and piping.

1. If contaminated, transport and dispose of water in an EPA approved disposal site in accordance with federal, state, and local requirements.
2. Non-contaminated water may be disposed of on-site.

3.8 DISPOSAL OF UNDERGROUND TANKS, ANCHORS, SLABS, AND ASSOCIATED PIPING

A. Preparation: API RP 1604. Remove the fill pipe, gage pipe, vapor recovery truck connection, submersible pumps, and drop tube.

1. Cap or remove non-product piping, except vent piping.
2. Plug tank openings so that vapors will exit through vent piping during the vapor-freeing process.

B. Purging: Remove flammable vapors in accordance with API RP 1604. Tanks shall be certified as "vapor free" prior to further work.

C. Cleaning and Testing: Clean tank and perform atmosphere testing in accordance with API RP 1604.

1. Distribution (product delivery) piping shall be cleaned and removed or the piping shall be cleaned, filled with concrete, and abandoned in place.
2. Test the tank atmosphere and the excavation area for flammable or combustible vapor concentrations, with a combustible gas indicator until the tank is removed from the excavation and from the site.

D. Tank Removal and Disposal:

1. Plug or cap accessible holes. One plug shall have a minimum 1/8-inch vent hole.
2. Remove tank from the excavation, place it on a level surface and render it useless in accordance with API RP 1604.
3. Provide warning labels on tank if tank contained leaded fuels as follows:
   a. "TANK HAS CONTAINED LEADED GASOLINE -- NOT VAPOR FREE -- NOT SUITABLE FOR STORAGE OF FOOD OR LIQUIDS INTENDED FOR HUMAN OR ANIMAL CONSUMPTION -- DATE OF REMOVAL: MONTH/DAY/YEAR"
4. Transport and dispose of tank at an EPA approved disposal site in accordance with federal, state, and local regulations.

3.9 INSPECTIONS

A. Arrange for and perform required inspections. Provide copies of inspections to the Owner's Project Manager.

3.10 CLOSURE REPORT (SITE ASSESSMENT REPORT)

A. Provide Owner's Project Manager a Site Assessment Report in a single binder notebook that contains the full collection of reports relating to this work, including but not limited to, records, starting and ending dates of reporting period, inspections, documentation, and data as follows:
   1. Complete UST Notification Form (within 30 days of closure).
   2. Description of work, including removal procedures, number of tanks removed, identification of tanks removed and disposed of, cubic yards of excavated soil, location of disposal sites, and dates of excavation.
   3. Site plan, including location of tanks and piping, limits of excavation, sampling points, results of excavation, and depths.
   4. Laboratory testing reports, copies of data and test results from testing laboratory.
   5. Tank disposal paperwork, contaminated soil disposal paperwork, and contaminated water disposal paperwork.
   6. Certifications required by implementing agency.
   7. Building permit, inspection permits, and other permits required for underground tank removal, notifications, and inspection reports.
   8. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.

3.11 SPILLS OF CONTAMINATED SOILS

A. Use appropriate vehicles and operating practices to prevent spillage or leakage of contaminated materials from occurring during operations. Inspect vehicles leaving the area of contamination to ensure that no contaminated materials adhere to the wheels or undercarriage.

3.12 BACKFILLING

A. Provide backfill, compaction, grading, and seeding in accordance with Section 313000 – Earthwork.

B. Line the excavation with two plastic sheets before backfilling.

END OF SECTION

SECTION 221000

PIPING AND PUMPS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes requirements and specifications for pipes, tubes, fittings, and joints. Provide flushing, disinfecting, and testing.

B.

1.2 RELATED SECTIONS

A. Section 221001 – Piping Specialties

1.3 SUBMITTALS

A. Product Data: Submit product data for each material and product used. Submit mechanical grooved pipe coupling and fitting manufacturer's installation instructions. Submit press-connect fitting manufacturer's installation instructions.

B.

1.4 QUALITY ASSURANCE

A. Qualify welding procedures, welders and welding operators in accordance with AWS D1.1.

B. NSF Compliance:

1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components.
2. Comply with requirements of utility company supplying water. Include tapping of water mains and backflow prevention.
3. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.
4. Comply with standards of authorities having jurisdiction for fire-suppression water-service piping, including materials, hose threads, installation, and testing.

1.5 REFERENCE STANDARDS

A. ANSI A 21.5 – American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems; current edition.

B. ANSI B 1.20.1 – NPT American Taper Pipe Thread; current edition.

C. ANSI B 16.3 – Malleable Iron Threaded Fittings; current edition.

D. ANSI B 16.4 – Cast Iron Threaded Fittings; current edition.

E. ANSI B 16.9 – Factory-Made Wrought Steel Butt-welding Fittings; current edition.

F. ANSI B 16.22 – Wrought Copper and Copper Alloy Solder Joint Pressure Fittings; current edition.

G. ANSI B 16.28 – Wrought Steel Butt-welding Short Radius Elbows and Returns; current edition.

H. ANSI B 16.29 – Wrought Copper and Copper Alloy Solder Joint Drainage Fittings; current edition.

I. ANSI B 16.39 – Malleable Iron Threaded Pipe Unions; current edition.

J. ANSI B 31.9 – Building Services Piping; current edition.

ASME B 16.51 – Copper and Copper Alloy Press-Connect Pressure Fittings

K. ASTM A 47 – Standard Specification for Ferritic Malleable Iron Castings; current edition.

L. ASTM A 53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless; current edition.

M. ASTM A 74 – Standard Specification for Cast Iron Soil Pipe and Fittings; current edition.

N. ASTM A 183 – Standard Specification for Carbon Steel Track Bolts and Nuts; current edition.

O. ASTM A 536 – Standard Specification for Ductile Iron Castings; current edition.

P. ASTM B 32 – Standard Specification for Solder Metal; current edition.

Q. ASTM B 88 – Standard Specification for Seamless Copper Water Tube; current edition.

R. ASTM B 306 – Standard Specification for Copper Drainage Tube; current edition.

S. ASTM C 12 – Standard Specification for Installing Vitrified Clay Pipe Lines; current edition.

T. ASTM C 425 – Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings; current edition.

U. ASTM C 564 – Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; current edition.

V. ASTM C 700 – Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated; current edition.

W. ASTM D 1785 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; current edition.

X. ASTM D 2000 – Standard Specification for Rubber Products in Automotive Applications; current edition.

Y. ASTM D 2564 – Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems; current edition.

Z. ASTM D 2665 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; current edition.

AA. ASTM D 2729 – Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings; current edition.

BB. ASTM D 2846 – Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems; current edition.

CC. ASTM D 2855 – Standard Specification for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings; current edition.

DD. ASTM D 3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings; current edition.

ASTM D 3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

EE. ASTM F 402 – Standard Specification for Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings; current edition.

FF. ASTM F 441 – Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80; current edition.

ASTM F876 Standard Specification for Crosslinked Polyethylene (PEX) Tubing.

ASTM F 877 – Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems.

ASTM F 1960 – Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Crosslinked Polyethylene (PEX) Tubing.

ASTM F 3226 – Standard Specification for Metallic Press-Connect Fittings

GG. AWWA C 104 – Cement-Mortar Lining for Ductile-Iron Pipe and Fittings; current edition.

HH. AWWA C 105 – Polyethylene Encasement for Ductile-Iron Pipe Systems; current edition.

II. AWWA C 110 – Ductile-Iron and Gray-Iron Fittings; current edition.

JJ. AWWA C 111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; current edition.

KK. AWWA C 151 – Ductile-Iron Pipe, Centrifugally Cast; current edition.

LL. AWWA C 600 – Installation of Ductile Iron Water Mains and Their Appurtenances; current edition.

MM. AWWA C 651 – Disinfecting Water Mains; current edition.

NN. AWWA C 900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inches through 12 inches, for Water Transmission and Distribution; current edition.

AWWA C 904 – S Standard for Crosslinked Polyethylene (PEX) Pressure Pipe, 1/2 in. through 3 in., for Water Service.

OO. AWS D 1.1 – Structural Welding Code-Steel; current edition.

PP. CISPI 301 – Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; current edition.

QQ. NFPA 13 – Standard for the Installation of Sprinkler Systems; current edition.

RR. NFPA 14 – Standard for the Installation of Standpipe and Hose Systems; current edition.

SS. NFPA 24 – Standard for the Installation of Private Fire Service Mains and their Appurtenances; current edition.

NSF 14 – Plastics Piping System Components and Related Materials

TT. NSF 61 – Drinking Water System Components; current edition.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Pipe and Fittings (except press-connect and mechanical grooved couplings and fittings): Manufacturers with materials in compliance with the requirements specified.

Press-Connect Fittings: ApolloPress, NIBCO Inc. or Viega LLC.

B. Mechanical Grooved Pipe Couplings And Fittings: Grinnell Mechanical Products, a Div. of Tyco Fire Suppression, Gustin-Bacon, Div. of Certainteed Corp., or Victaulic Co. of America, Anvil International.

PEX-A: Apollo Expansion PEX, Mr. PEX, Rehau, or Uponor (Wirsbo).

2.2 PIPE AND TUBE

A. Steel Pipe: ASTM A 53; black or galvanized and Schedule weight as indicated.

B. Steel Pipe Wrapping: Polyvinyl chloride tape; machine or hand wrapped and overlap as indicated.

C. Cast Iron Soil Pipe: ASTM A 74; coated; service or extra heavy weight as indicated.

D. Hubless Cast Iron Soil Pipe: CISPI 301; service weight.

E. Ductile Iron Water Pipe: AWWA C151; Class as indicated.

1. Cement-Mortar Lining: AWWA C104.

2. Polyethylene Encasement: ANSI A21.5.

F. Copper Water Tube: ASTM B 88; Type K or L and temper as indicated.

G. Copper Drainage Tube: ASTM B 306, DWV.

H. CPVC Pipe: ASTM F 441, Schedule 40 and Schedule 80.

I. PEX-A Pipe: ASTM F 876 and ASTM F 877.

J. PVC Pipe: ASTM D 1785, Schedule 40 and Schedule 80.

K. PVC Plastic Sewer Pipe: ASTM D 3034, SDR 35.

L. PVC Plastic Pressure Pipe: AWWA C900; pressure class as indicated.

M. PVC Plastic Drain Pipe: ASTM D 2665, DWV.

N. Vitrified Clay Pipe: ASTM C 700; standard or extra strength as indicated.

2.3 PIPE AND TUBE FITTINGS

A. Steel Pipe Fittings:

1. Malleable Iron Threaded Fittings: ANSI B16.3; plain or galvanized as indicated; Class 150.

2. Malleable Iron Threaded Unions: ANSI B16.39; Class 150.

3. Wrought Steel Buttwelded Fittings: ANSI B16.9, except ANSI B16.28 for short radius elbows and returns; rated to match connected pipe.

4. Cast Iron Threaded Fittings: ANSI B16.4; Class 125 or 250 as indicated.

5. Mechanical Grooved Couplings and Fittings: Specifically designed to engage and lock grooved pipe ends and allow some angular deflection, contraction and expansion, as follows:
   a. Cut groove or roll groove type as indicated.

b. Couplings: ASTM A 47 malleable iron or ASTM A 536 ductile iron housings, cast in two or more parts; ASTM D2000, C-shaped, pressure responsive EPDM gaskets; ASTM A183, heat treated carbon steel bolts and nuts with zinc electroplated finish, minimum 110,000 psi tensile strength.

c. Fittings: ASTM A 47 malleable iron or ASTM A 536 ductile iron or ASTM A 53 steel, grooved ends.
   Branch Outlet Fittings: Grooved or threaded outlet; integral pressure responsive gasket.
   Sprinkler Head Fittings: Attachment by breakaway-head bolt or integral outlet adapter; integral pressure responsive gasket.

a. Flanges: ASTM A 47 malleable iron or ASTM A 536 ductile iron; bolt hole alignment conforming to Class 125 cast iron or Class 150 steel; with gasket.

B. Cast Iron Soil Pipe Fittings:
   1. Hub-and-Spigot Fittings: ASTM A 74.
   2. Compression Gasket Joints: ASTM C 564.
   3. Hubless Fittings and Joints: CISPI 301.

C. Ductile Iron Water Pipe Fittings:
   1. Ductile Iron Fittings: AWWA C110.
   2. Rubber Gasket Joints: AWWA C111; push-on.
   3. Cement-Mortar Lining (for ductile iron fittings): AWWA C104.
   4. Polyethylene Encasement (for ductile iron fittings): ANSI A21.5.

D. Copper Water and Drainage Tube Fittings:
   1. Wrought Copper, Soldered Joint Water Tube Fittings: ANSI B16.22.
   2. Wrought Copper, Soldered Joint Drainage Tube Fittings: ANSI B16.29.
   3. Solder: ASTM B 32, Grade 50A or 95TA as indicated.
   4. Wrought copper, Press-Connect Joint Water Tube Fitting: ASTM F 3226

E. PVC Plastic Fittings:
   1. PVC Pressure Pipe Fittings: AWWA C900.
   2. PVC Plastic Drain Pipe Fittings: ASTM D 2665 DWV socket type with ASTM D 2564 low VOC joint solvent cement.
   3. PVC Plastic Sewer Pipe Fittings: ASTM D 3034, SDR 35; with ASTM D 2564 low VOC joint solvent cement.
   4. Rubber Gasket Joints: AWWA C900; push-on.

5. Vitrified Clay Pipe Fittings: ASTM C 700; bell-and-spigot, standard or extra strength as indicated; ASTM C 425 resilient gasket joints.
6. Dielectric Unions: As specified in Section 221001 – Piping Specialties.

PEX-A Plastic Fittings:

7. PEX-A Cold-Expansion Fittings: ASTM F 1960; ASTM F 1960 cold-expansion reinforcing rings.

F.

PART 3 - EXECUTION

3.1 GENERAL

A. Install piping materials as indicated with offsets, fittings, and changes in elevations as required to make adjustments for obstacles or interferences.

B. Determine exact route or location of all piping materials prior to installation.

C. Do not allow piping materials installation to cause any equipment to be unserviceable or inoperable.

3.2 STEEL PIPE JOINTS

A. Thread pipe joints in accordance with ANSI B1.20.1.

3.3 CAST IRON AND DUCTILE IRON PIPE JOINTS

A. Comply with General Installation Instructions in Chapter IV of CISPI Cast Iron Soil Pipe & Fittings Handbook.

B. Make connections to equipment and branch mains with unions.

3.4 COPPER TUBE SOLDER JOINTS

A. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings.

B. Apply solder flux to joint areas of both tubes and fittings.

C. Solder full depth and circumference of joint using Grade 95TA (95-5) for water tube and Grade 50A (50-50) for drainage tube. Do not use on potable water systems – contains lead.

D. Wipe excess solder from joint before it hardens.

E. Make connections to equipment and branch mains with unions.

3.5 COPPER TUBE PRESS-CONNECT JOINTS

A. Cut tube ends squarely, ream to full inside diameter, deburr, and clean outside of tube ends and inside of fittings.

Mark tube to indicate proper tube insertion depth.

Insert tube into fitting and ensure tube is fully seated.

Crimp fitting using compatible jaw and tool approved by manufacturer.

Mark crimped joints in a plainly viewable location

B. Make connections to equipment and branch mains with unions.

3.6 PLASTIC PIPE JOINTS

A. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

B. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.

C. CPVC Piping: Join according to ASTM D 2846 Appendix.

D. PVC Piping: Join according to ASTM D 2855.

PEX-A Piping Cold-Expansion Joints: Utilize manufacture-recommended cold-expansion tool. Join according to manufacturer's installation procedures.

E. Make connections to equipment and branch mains with unions.

3.7 VITRIFIED CLAY PIPE JOINTS

A. Comply with ASTM C 12.

3.8 PIPING INSTALLATION

A. Install pressure piping in accordance with ANSI B31.9.

B. Install ductile iron water pipe in accordance with AWWA C600.

1. Encase ductile iron water pipe and fittings with polyethylene in accordance with AWWA C105.

C. Install copper tube in accordance with recommended procedures of the CDA Copper Tube Handbook.

D. Remove dirt and debris from inside and outside pipe and fitting materials before assembly. Keep piping interior clean as work progresses.

E. Plug or cap ends of incomplete piping at end of work day or whenever work stops.

F. Install piping to achieve permanently leakproof piping systems, capable of performing each indicated service without piping failure.

G. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance of valves and equipment.

H. Reduce piping sizes, where indicated, with reducing fittings.

I. Install dielectric unions at each piping joint and equipment connection between ferrous and non-ferrous materials.

J. Route piping runs vertically and horizontally (pitched to drain), unless otherwise indicated.

K. Install piping exposed, except conceal piping in office complex rooms other than mechanical equipment rooms, and elsewhere as indicated.

L. Route exposed horizontal runs parallel or perpendicular to building lines.

M. Route piping runs above the bottom chords of steel roof support joists metal building rigid frames with vertical drops along walls/columns or to equipment as applicable, unless otherwise indicated.

N. Ensure piping is aligned in a neat, uniform manner. Align piping accurately at joints, within 1/16 inch misalignment tolerance.

PEX-A shall not be installed in areas within five feet of a UV light source, such as LED and fluorescent light fixtures or other UV generating devices.

White PEX-A shall not be installed outdoors where it is exposed to direct sunlight light for more than one month; red or blue PEX shall not be installed outdoors where it is exposed to direct sunlight for more than six months.

PEX-A piping shall be installed per ASTM E84 requirements for plenum applications.

PEX-A piping passing through wall plates and metal studs shall be protected or shielded as required to prevent damage to piping.

3.9 FLUSHING, DISINFECTING AND TESTING

A. Flush-out piping systems with clean water.

B. Disinfect domestic water piping in accordance with AWWA C651.

C. Flush and test fire protection piping in accordance with NFPA 13, NFPA 14 and NFPA 24.

Test soil and waste piping and roof drainage piping in accordance with requirements of NAPHCC National Standard Plumbing Code.

END OF SECTION

SECTION 221001

PIPING SPECIALTIES

PART 1 - GENERAL

SECTION INCLUDES

A. This section includes requirements and specifications for piping specialties including but not limited to pipeline strainers, vent caps, dielectric unions, expansion joints, flexible pipe connectors, sleeves and sleeve seals, and escutcheons.

RELATED SECTIONS

B. Section 221000 – Piping and Pumps

SUBMITTALS

C. Product Data: Submit product data for each material and product used.

QUALITY ASSURANCE

D. Comply with applicable portions of PHCC National Standard Plumbing Code pertaining to plumbing materials, construction and installation of products.

E. Comply with NSF 14 for plastic potable domestic water piping and components. Include marking "NSF-pw" on piping.

F. Provide Seismic Restraint Devices

G. Comply with NSF 61 for potable domestic water piping and components.

REFERENCE STANDARDS

H. FCI 73-1 – Pressure Rating Standard for “Y” Type Strainers; current edition.

I. NSF 14 – Plastics Piping System and Components and Related Materials; current edition.

J. NSF 61 – Drinking Water System Components; current edition.

PART 2 - PRODUCTS

MANUFACTURERS

K. Acceptable Pipeline Strainer Manufacturers: Armstrong Machine Works, ITT McDonnell & Miller, The Metraflex Co., Sarco Co, or Hayward Industrial Products, Inc.

L. Acceptable Vent Cap Manufacturers: Josam Mfg. Co., Jay R. Smith Mfg. Co., or Zurn Industries, Inc.

M. Acceptable Expansion Joint Manufacturers: Flexicraft, Senior Flexonics, The Metraflex Co., Vibration Mountings and Controls, Inc., or Proco Products, Inc.

N. Acceptable Flexible Pipe Connector Manufacturers: Senior Flexonics, Expansion Joint Div., Mason Industries, Inc., The Metraflex Co., Vibration Mountings and Controls, Inc., or Proco Products, Inc.

PIPELINE STRAINERS

O. Y-Type Pipeline Strainers: Full line sized with connections which properly mate with adjoining piping; 125 psi working pressure; Type 304 stainless steel screens; 3/64 inch perforations, 233 per square inch; in compliance with FCI 73-1, with body, screen retainer and ends as follows:

For Pipe Sizes Two Inches and Smaller: Cast iron body, screwed screen retainer with centered blowdown fitted with pipe plug; threaded ends.

For Pipe Sizes Over Two Inches: Cast Iron or Schedule 40 cast carbon steel body, bolted screen retainer with off-centered blowdown fitted with pipe plug; threaded or flanged ends.

VENT CAPS

P. Vent Caps: Vandal-proof; cast-iron, full sized to vent pipe; caulked base connection for cast-iron pipes, threaded base connection for steel pipes.

DIELECTRIC UNIONS

Q. Dielectric Unions: Standard products manufactured for service indicated, which effectively isolate ferrous from non-ferrous piping (electrical conductance), prevent galvanic action, and stop corrosion.

EXPANSION JOINTS

R. Provide pipe sized packless expansion joints with materials and pressure/temperature ratings to suit intended use of piping system, and with connections which properly mate with adjoining piping.

S. Provide packless expansion joints to provide 200% absorption capacity of piping expansion between anchors.

T. Expansion Compensators:

For Steel Piping: Two ply stainless steel bellows, carbon steel shrouds, and end fittings; internal guides, anti-torque device and removable end clip for proper positioning.

For Copper Tube: Two ply phosphor bronze bellows, brass shrouds, and end fittings; internal guides, anti-torque device and removable end clip for proper positioning.

U. Pipe Alignment Guides: Four finger spider assembly constructed for traveling inside a guiding sleeve; with provisions for anchoring to building substrate.

FLEXIBLE PIPE CONNECTORS

V. Provide pipe sized flexible pipe connectors with connections which properly mate with adjoining piping as follows:

For Ferrous Piping: Stainless steel inner hose covered with stainless steel wire braid; NPT steel nipples or 150 psi flanges, welded to hose.

For Non-Ferrous Piping: Bronze inner hose covered with bronze wire braid; copper tube ends or bronze flanged ends, brazewelded to hose.

SLEEVES AND SLEEVE SEALS

W. Sleeves: Fabricated from Schedule 40 galvanized steel pipe or 18 gage galvanized sheet metal to form round tube closed with snaplock joint, welded spiral seams or welded longitudinal joint, or Schedule 40 PVC plastic pipe.

X. Size sleeves large enough to allow for movement due to expansion and to provide for continuous insulation.

Y. Sleeve Seals: Modular mechanical type; interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve; connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened.

ESCUTCHEONS

Z. Pipe Escutcheons: Chrome plated steel; sized with inside diameter closely fitting pipe outside diameter or outside of pipe insulation, as applicable; outside diameter of escutcheon large enough to cover pipe penetration hole.

PART 3 - EXECUTION

3.2 PIPELINE STRAINERS INSTALLATION

A. Install Y-type strainers full sized to adjoining piping. Install pipe nipple and shutoff valve in strainer blowdown connection.

B. Locate Y-type strainers in supply line ahead of the following equipment:

Temperature control valves.

Pressure reducing valves.

Temperature or pressure regulating valves.

3.3 VENT CAPS INSTALLATION

A. Install vandal-proof vent caps on each vent pipe passing through roofing. Locate vent cap minimum six inches above roof surface.

3.4 DIELECTRIC UNIONS INSTALLATION

A. Install dielectric unions at each piping joint and equipment connection between ferrous and non-ferrous materials.

3.5 EXPANSION JOINTS INSTALLATION

A. Install expansion compensators to control expansion and contraction in piping systems where natural gas, domestic water, soil and waste, roof drainage, and fire protection piping systems cross system crosses building expansion joints with ¾ inch pipe size and larger.

B. Install pipe alignment guides on both sides of expansion joints so that movement takes place along axis of pipe only. Rigidly anchor guides to building substrate.

3.6 FLEXIBLE PIPE CONNECTORS INSTALLATION

A. Install flexible pipe connectors in piping systems, as follows:

At connections with vibration isolated equipment with 3/4 inch pipe size and larger.

B. Install flexible pipe connectors on equipment side of shutoff valves horizontally and parallel to equipment shafts wherever possible. Install flexible connectors at right angles to displacement. Install one end of connector immediately adjacent to isolated equipment and anchor other end.

3.7 SLEEVES AND SLEEVE SEALS INSTALLATION

A. Install sleeves where piping passes through floors, walls, and footings.

B. Set sleeves in position in advance of concrete and masonry work. Install sleeves accurately centered on pipes.

C. Install length of sleeve equal to thickness of construction penetrated, except extend floor sleeves one inch above finished floor level.

D. Provide temporary support of sleeves during placement of concrete, masonry, and other work around sleeves. Provide temporary closure to prevent concrete and other materials from entering sleeves.

E. Install sleeve seals for pipe sleeves in footings and exterior walls.

F. Tighten sleeve seal bolts until rubber links have expanded to form watertight seal.

3.8 ESCUTCHEONS INSTALLATION

A. Install escutcheons on piping through walls and ceilings where penetration is exposed to view.

B. Install escutcheons on exterior of building on piping penetrations through walls.

C. Secure escutcheon to pipe or insulation so escutcheon covers penetration hole and is flush with adjoining surface.

END OF SECTION

SECTION 260000

ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES:

A. This section includes requirements and specifications for electrical work including, but not limited to:
   1. Equipment Grounding
   2. Supporting devices.

1.2 RELATED SECTIONS

A. None

1.3 SUBMITTALS

A. Submit shop drawings and manufacturer's product data and installation instructions in accordance with submittal procedures.
B. Submit cable tray manufacturer's support recommendations and installation instructions.
C. Submit wireway manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70 requirements for electrical materials and installation.
B. Keep copy of NFPA 70 in field office for duration of project.
C. Provide products and components which have been UL listed and labeled, including UL marks indicating special type usage whenever applicable.

1.5 REFERENCE STANDARDS

A. National Fire Protection Association (NFPA)
   1. NFPA 70 - National Electrical Code (NEC), including state and local amendments; current edition.
B. National Electrical Manufacturers Association (NEMA)
   1. Requirements applicable to product manufacturing standard; current edition.
C. Underwriters Laboratories Inc. (UL)

1. Requirements applicable to product listing and labeling.

D. NECA 1, Standard for Good Workmanship in Electrical Construction; current edition.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING

A. Provide each electrical grounding system with assembly of materials required for complete installation including wires/cables, connectors, lugs, clamps, rods, bonding jumpers, and accessories.

B. Provide equipment grounding conductors for grounding connections matched to supply power overcurrent device and sized according to the NEC.

C. Provide equipment ground connectors, lugs, clamps, bonding jumpers, and accessories in accordance with the NEC and as recommended by the respective manufacturer for the particular application.

D. Insulated Conductors: Green in color.

2.2 SUPPORTING DEVICES

A. Acceptable Conduit, Cable Tray, and Wireway Supports Manufacturers:
   1. Same as manufacturers of U-channel, conduit and fittings cable trays, fittings, and accessories.

B. Acceptable U-Channel Manufacturers:
   1. Cooper B-Line, Inc.; a division of Cooper Industries
   2. Thomas & Betts Corporation
   3. Unistrut; Tyco International, Ltd.

C. Cable Tray and Wireway Supports: As recommended by the manufacturer.

D. Conduit Supports:
   1. As described in NECA 1.
   2. Single Run Hangers: Galvanized steel conduit straps, hangers, or clamps. Use clamps with spacers when mounting to wall or column. Do not use perforated straps and spring steel clips or clamps.
   3. Group Run Hangers: Minimum 12-gage galvanized, preformed U-channel rack with conduit fittings; 25% spare capacity.
   4. Hanger Rods: Threaded steel, 3/8 inch diameter.
   5. Vertical Run Supports: Minimum 12-gage galvanized, preformed U-channel struts with conduit fittings.

E. Equipment and Lighting Supports:

1. U-Channel: Minimum 12-gage galvanized, preformed U-channel struts with fixture and conduit fittings, as applicable.
2. Loose Steel Angles, Channels, Plates and Tubing

F. Anchors:
1. For Hollow Masonry: Toggle bolts.
2. For Solid Masonry: Lead expansion anchors.
3. For Concrete: Self drilling anchors.
4. For Wood: Wood screws.
5. For Metal: Machine screws or bolts or steel clamps, as required for application.

PART 3 - EXECUTION

3.1 GENERAL

A. Comply with requirements for Class 1, Division 2 location for building areas where vehicles are parked, in accordance with NFPA 70.

B. Determine exact route or location of all electrical materials prior to installation.

C. Install electrical materials as indicated with offsets, fittings, and changes in elevations as required to make adjustments for obstacles or interference.

D. Do not allow the installation of electrical materials and conduit routing to cause any mechanical system inoperable.

E. Do not allow electrical materials to protrude into pedestrian or vehicle paths. Coordinate with Owner's Project Manager.

3.2 GROUNDING INSTALLATION

A. Install an equipment ground conductor within all power, control, and lighting raceway. Adjust conduit size, where necessary, for addition of equipment ground conductor.

B. Install grounding locknuts and bushings as required.

C. Install grounding bushings with lug on outgoing conduits at panelboards. Connect #4 copper wire to grounding bushings and to ground bus or lug.

D. Install double locknuts, one inside and one outside, on all RGS, IMC, and FMC penetrating enclosures and boxes with a clean knockout (no concentric rings remaining).

E. Install listed fitting outside and one locknut inside on all EMT penetrating enclosures and boxes with a clean knockout (no concentric rings remaining).

F. Install bonding jumper wire between conduit, grounding locknuts, bushings, and enclosure or box that contains knockouts with concentric rings remaining.

G. Install bonding jumpers from non-flexible conduit to motor terminal boxes and other equipment where FMC is required for connections, unless liquid tight FMC of 1-1/4 inches in diameter or smaller and six feet long or less is used for the connection.

H. Install bonding jumpers to connect conduit, cable tray, and wire way expansion fittings or sections where crossing building expansion joints.

I. Bond equipment ground conductor to all metal enclosures and boxes.

J. Ensure that entire electrical system is electrically continuous and permanently and effectively grounded, including all electrical equipment and motors.

3.3 SUPPORTING DEVICE INSTALLATION

A. Install supports, anchors, sleeves, and seals to rigidly fasten conduit, wireway, and equipment.

B. Support conduit at intervals not to exceed 10 feet and within three feet of any box, conduit body, panel, or other terminating equipment.
   1. Install wall supported conduit with a clearance of not less than 1/4 inch from wall.
   2. Install tube steel or U-channel vertical run supports if conduit is not supported by wall, column, or equipment.
   3. Install additional support for vertical drops of EMT from joist where necessary to prevent the conduit from pulling away from the fitting.
   4. Install conduit at cable trays with listed cable tray clamps or adapters.

C. Support wireway at intervals not to exceed five feet.

D. Do not weld supports of any kind to building structural steel members.

E. Do not fasten supports of any kind to steel roof deck.

F. Do not use conduit or other pipe of any kind as a means of support.

G. Welding supports to building structural members and/or fastening supports to roof deck panels or other conduit or pipe will not be permitted.

END OF SECTION

SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes requirements and specifications for common electrical work results including, but not limited to:
   1. Raceways.
   2. Wires and connectors.
   3. Boxes and fittings.
   4. Wiring devices.
   5. Enclosures.
   6. Electrical identification.
   7. Testing.

1.2 RELATED SECTIONS

A. Division 31 - Earthwork

1.3 SUBMITTALS

A. Submit shop drawings and manufacturer's product data and installation instructions.

B. Submit cable tray manufacturer’s support recommendations and installation instructions.

C. Submit wireway manufacturer’s installation instructions.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70 requirements for electrical materials and installation.

B. Keep copy of NFPA 70 in field office for duration of project.

C. Provide products and components which have been UL listed and labeled, including UL marks indicating special type usage whenever applicable.

1.5 REFERENCE STANDARDS

A. ANSI C80.1 – Galvanized Rigid Conduit (GRC); current edition.

B. ANSI C80.3 – Steel Electrical Metal Tubing (EMT); current edition.

C. ANSI C80.5 – Electrical Rigid Aluminum Conduit (ERAC); current edition.

D. ANSI Z535.4 – Product Safety Signs and Labels, Includes Errata; current edition.

E. 29 CFR 1910.145 – Specifications for accident prevention signs and tags; current edition.

F. National Fire Protection Association (NFPA)
   1. NFPA 70 - National Electrical Code (NEC), including state and local amendments.

G. National Electrical Manufacturers Association (NEMA); current editions.
   1. Requirements applicable to product manufacturing standard.
   2. NEMA 250 – Enclosures for Electrical Equipment (1000 Volts Maximum)
   3. NEMA FB 1 – Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable
   4. NEMA ICS 2 or IEC – Controllers, Contactors and Overload Relays Rated 600 V
   5. NEMA ICS 6 – Industrial Control and Systems: Enclosures
   6. NEMA TC 2 – Electrical Polyvinyl Chloride (PVC) Conduit
   7. NEMA TC 3 – Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing
   8. NEMA TC 13 – Electrical Nonmetallic Tubing (ENT)
   9. NEMA VE 1 – Metal Cable Tray Systems
   10. NEMA WC 70 – Power Cables Rated 2000 V or Less for the Distribution of Electrical Energy

H. Underwriters Laboratories Inc. (UL); current editions.
   1. Requirements applicable to product listing and labeling.
   2. UL 870 – Standard for Wireways, Auxiliary Gutters, and Associated Fittings
   3. UL 1660 – Liquid-Tight Flexible Nonmetallic Conduit

PART 2 - PROCUCTS

2.1 WIRES, CABLES AND CONNECTORS

A. Acceptable Wire and Cable Manufacturers:
   1. Wires and Cable Conductors:
      a. General Cable Corporation.
      b. Southwire Company.
   2. Control, Instrumentation, Data and Communication Cables
      a. Alpha Wire

b. Belden CDT Inc., Electronics Division
c. CommScope, Inc.
d. Genesis Cable Products
e. General Cable Company
f. National Wire and Cable Corporation

B. Acceptable Wire and Cable Connector Manufacturers:
1. Burndy Corp.
2. Ideal Industries, Inc.
3. AFC Cable Systems, Inc.
4. Hubbell Power Systems, Inc.
5. Tyco Electronics Corporation
6. O-Z/Gedney, EGS /Electrical Group LLC.
7. Thomas & Betts Corp.

C. Acceptable Terminal and Distribution Block Manufacturers:
1. Allen Bradley/Rockwell Automation
2. Cutler Hammer, Div. of Eaton Corp.
3. General Electric
4. Square D, Schneider Electric

D. Wires:
1. Conductors: stranded copper complying with NEMA WC 70.
2. Insulation type as follows:
a. Dry locations: all conductors Type THHN (90°C); 600 volt, flame retardant and heat resistant thermoplastic.
b. Wet locations: all conductors Type THWN (75°C); 600 volt, flame retardant, moisture and heat resistant thermoplastic.

E. Cables:
1. Complying with NEMA WC 70.
2. Flexible Cord: Type SO (60°C); 600 volt; copper conductors with green colored ground, rubber insulation and oil resistant neoprene outer covering.
3. Tray Cable: Type TC (90°C); 600 volt; copper conductors with green colored ground and PVC outer covering.
4. Control, Instrumentation, Data and Communication Cable: Type CM, CL (60°C) and PLTC (105°C); 300 volt; copper conductors; 100 % shield coverage and drain wire. For DC voltage applications, including photoelectric sensors and variable frequency drives.
5. Device Cable: Cables that are factory assembled as part of a permanent non-removable connection to a device shall have insulation rated in

accordance with the maximum circuit voltage applied to the cable. Where the cable shares a raceway or enclosure with other conductors that operate at a higher circuit voltage, it must have an insulation rating in accordance with the maximum voltage applied to the other conductors.

6. Communication cable for Programmable Logic Controllers (PLC) and Personal Computers (PC): as recommended by the equipment manufacturer.
7. Metal Clad Cable: Type MC (90°C), THHN Copper conductors factory assembled with insulated circuit conductors enclosed in an armor of interlocking metal tape or corrugated metallic sheath.

F. Splice and Terminal Connectors: Factory fabricated, metal connectors compatible with conductor material, as follows:
   1. Bolted or screwed mechanical pressure type.
   2. Compression/crimped pressure type.
      a. Tin-plated, aluminum adapter sleeves are not permitted.
   3. Twist-on pressure type plastic or nylon insulator cap with internal threaded core and spring insert

G. Terminal Blocks: NEMA ICS 4 or IEC; modular, channel (rail) mounted with end stops; solderless, box clamp type terminals 300 volt rated for control conductors, 600 volt rated for power conductors; current rated for the applicable conductors; suitable for connection of copper conductors; with marking strips. Maximum of two control conductors per terminal lug if permitted by the terminal UL listing. Maximum of one power conductor per terminal lug.

H. Distribution Blocks: For distributing high current carrying capacity to multiple power loads; direct mounted; pressure type lug terminals; 600 volt rated for power conductors; ampere rated for the applicable conductors and loads; suitable for connection of copper conductors; with marking strips. Multiple conductors per block. Distribution blocks to be covered with a UL listed clear cover for personnel protection.

2.2 RACEWAYS

A. Cable Trays, Fittings and Accessories:
   1. Acceptable Manufacturers:
      a. B-Line Systems, Inc.
      b. Cope Cable Tray, a division of Allied Electrical Group
      c. P –W Industries, Inc.
      d. Square D, Schneider Electric
   2. Provide cable tray system complying with NEMA VE 1.
   3. Provide straight sections, reducers, bends, tees, crosses, elbows, covers, clamps, hangers, brackets, splice plates, reducer plates, blind ends,

barrier strips, connectors, expansion connectors, drop-outs, conduit adapters, bonding jumpers, and any other component parts reasonably incidental to providing a complete cable tray system.

4. Provide ladder type cable trays capable of supporting a uniformly distributed load of 50 lbs./ft. with a maximum deflection of 0.6 inch at midpoint of a 10 foot simple span and capable of supporting concentrated loads of 200 pounds at any point, over and above full cable loads, as follows:
   a. Material and Finish: Galvanized steel or aluminum.
   b. Cross Rungs: Six inches o.c. spacing.
   c. Construction: Four inch I-beam or channel shape side rails, welded to rungs.
   d. Fittings: 12 inches minimum radius.
   e. Covers: Flanged, ventilated.
5. Fabricate units with rounded edges and smooth surfaces.

B. Conduit and Fittings:
   1. Acceptable Metal Conduit and Fittings Manufacturers:
      a. RGS, IMC, EMT and FMC Conduit and Fittings:
         1) Allied Tube & Conduit, a Tyco International Ltd. Co.
         2) Hubbell Raco
         3) LTV Copperweld
         4) O-Z/Gedney, a unit of General Signal.
         5) Southwire Company
         6) Thomas & Betts Corp.
         7) Wheatland Tube Co.
         8) Western Tube & Conduit
      b. Expansion Fittings:
         1) Crouse-Hinds, a division of Cooper Industries, Inc.
         2) O-Z/Gedney Co.
         3) Southwire Company
         4) Spring City Electrical Mfg. Co.
         5) Thomas & Betts Corp.
      c. Sealing and Drainage Fittings:
         1) American Electric Industries
         2) Appleton Electric Co.
         3) Crouse-Hinds, a division of Cooper Industries, Inc.
         4) O-Z/Gedney, a unit of General Signal.
         5) Spring City Electrical Mfg. Co.
         6) Thomas & Betts Corp.
      d. Wall and Floor (Smoke and Fire) Seals:
         1) American Electric Industries
         2) Appleton Electric Co.

3) Crouse-Hinds, a division of Cooper Industries, Inc
4) O-Z-Gedney, a unit of General Signal.
5) Spring City Electrical Mfg. Co.
6) Thomas & Betts Corp.

2. Minimum Conduit Size: 1/2 inch.
3. Rigid Galvanized Steel Conduit (RGS) conforming to ANSI C80.1 and Intermediate Metal Conduit (IMC) conforming to ANSI C80.6; hot dip galvanized; standard threaded conduit couplings.
4. RGS and IMC Fittings: Conforming to NEMA FB 1; hot dip galvanized or zinc or cadmium electroplated, threaded, split-couplings unacceptable; Fittings compatible with conduit.
5. Electrical Metallic Tubing (EMT): Conforming to ANSI C80.3; electro-galvanized, compression type.
6. EMT Fittings: Conforming to NEMA FB1; electro-galvanized; steel compression type; rain and concrete tight; insulated throat connectors with case hardened locknuts. Do not use indentation or set screw type fittings of any kind.
7. Flexible Metal Conduit (FMC): complying with UL 1; hot dip galvanized steel.
8. FMC Fittings: Conforming to NEMA FB 1, Type 1, Class 1, Style A; hot dip galvanized or zinc or cadmium electroplated; connectors compatible with conduit.
9. Liquid Tight FMC: Complying with UL 1660; constructed of single strip, flexible continuous, interlocked, and double-wrapped steel; hot dip galvanized inside and outside; coated with liquid-tight jacket of flexible polyvinyl chloride.
10. Liquid Tight FMC Fittings: Conforming to NEMA FB 1; Type 1, Class 3, Style G; hot dip galvanized or zinc or cadmium electroplated; connectors compatible with conduit.
11. Rigid Nonmetallic Conduit (RNC): Schedule 40 Rigid PVC; conforming to NEMA TC 2, for direct burial underground or above ground installations.
12. RNC: Schedule 80 Rigid PVC; conforming to NEMA TC 2, Type 1 for encasement in concrete underground.
13. RNC Fittings: Conforming to NEMA TC3; matched to conduit/tubing type and material.
14. Electrical Nonmetallic Flexible Tubing (ENT): Conforming to NEMA TC 13; for above ground installations, connectors compatible with tubing.
15. Expansion Fittings: Specifically designed to permit four inches linear movement and 30 degrees angular movement in conduit runs, and to mate with adjoining conduit; iron or steel body, hot dip galvanized or zinc electroplated; with bonding jumper.

16. Sealing and Drainage Fittings: Corrosion resistant cast metal body with openings for filling/inspection and drainage; corrosion resistant opening plugs; female hub, top and bottom; specifically designed for sealing vertical runs of conduit to restrict the passage of gases, vapors, and flames and to limit explosions; sealing compound as required and recommended by fitting manufacturer to provide a complete seal.
17. Wall and Floor (Smoke and Fire) Seals: Factory assembled watertight seals suitable for sealing around conduit passing through concrete foundations, fire rated walls, and fire rated floors; constructed with steel sleeves, iron body, neoprene sealing grommets and rings, metal pressure rings, pressure clamps, and cap screws.
    Sleeve seal manufacturers:
    a. Advance Products & Systems, Inc.
    b. Calpico, Inc.
    c. Metraflex Co.
    d. Pipeline Seal and Insulator, Inc.

C. Wireway, Fittings and Auxiliary Gutters:
1. Acceptable Manufacturers:
    a. Cooper B-Line, Inc.
    b. Hoffman
    c. Square D, Schneider Electric
2. Provide wireway straight sections, couplings, offsets, elbows, expansion joints, adapters, hold down straps, end caps, hangers, and any other component parts reasonably incidental to providing a complete wireway system.
3. Provide lay-in type wireway and auxiliary gutters as follows:
    a. Material and Finish: Sheet metal, phosphatized and gray enamel finished.
    b. Construction: NEMA Type 1, with hinged covers, conforming to NEMA ICS 6 and complying with UL 870.

2.3 BOXES AND FITTINGS

A. Acceptable Manufacturers:
1. Crouse-Hinds, a division of Cooper Industries, Inc.
2. EGS/Appleton Electric Co.
3. Hubbell Incorporated, Killark Electric Manufacturing Co. Division
4. RACO, a Hubbell Company
5. O-Z/Gedney, a unit of General Signal
6. Spring City Electrical Mfg. Co.

7. Thomas & Betts Corporation
8. Hoffman

B. Provide boxes compatible with conduit and of types, shapes, and sizes, including box depths, to suit each respective location.

C. Provide box covers of same material as box, unless otherwise indicated, and of types, shapes, and sizes to suit each respective location.

D. Provide box accessories as required for mounting at each respective location including mounting brackets, wallboard hangers, extension rings, fixture studs, clamps, and straps.

E. Pull and Junction Boxes (without terminal or distribution blocks): Conforming to NEMA OS 1; galvanized sheet steel; welded seams; screw-on covers; equipped with stainless steel nuts, bolts, screws and washers. NEMA Type 1.

F. Floor Boxes: Conforming to NEMA FB 1; cast iron watertight adjustable type; threaded conduit entrance end; vertical adjusting rings; gasketed; brass floor plates, flush screw-on covers.

G. Terminal and Distribution Boxes (containing terminal or distribution blocks): Gray finish; white subpanel; welded seams; hinged door; conforming to NEMA 250; NEMA Type 12.

H. Interior Outlet Boxes: Conforming to NEMA OS 1; galvanized sheet steel; stamped knockouts in back and sides; threaded screw holes with corrosion resistant screws for securing box covers and wiring devices.

I. Conduit Bodies (condulets): Conforming to NEMA FB 1; galvanized cast metal; threaded conduit entrance ends; removable covers, corrosion resistant screws.

J. Bushings, Knockout Closures and Locknuts: Conforming to NEMA OS 1; corrosion resistant punched steel box knockout closures and conduit locknuts; malleable iron conduit bushings and offset connectors.

K. Receptacle Floor Fitting: Aluminum with brushed finish, three inches high maximum; complete with mounting base, insert adaptor, and locking nipple for duplex floor receptacle specified in this section.

L. Telephone Floor Fitting: Aluminum with brushed finish; flush mounting with single faced one-hole cover.

M. Exterior Outlet Boxes: Corrosion resistant cast metal; threaded conduit ends; include “weatherproof while in use” hinged cover.

N. Strain Relief Grip: Woven steel mesh with connection fitting, designed to absorb pull, flexure, and vibration exerted on cord or cable and prevent disconnection at wired terminals.

O. LAN Outlet Boxes: Aluminum FS devise box with ¾ inch threaded hub epoxy powdered coated.

2.4 ENCLOSURES

A. Provide enclosures for terminal and distribution blocks, manual and magnetic motor starters, motor safety switch disconnects, contactors, relays, controllers, transformers, and all other power and control equipment, conforming with NEMA 250 and suitable for surface mounting, as follows:
   1. In NFPA 70 Class 1, Division 2 Interior Locations: NEMA Type 7 (Explosion Proof).
   2. Exterior Locations: NEMA type 3R.
   3. All Other Locations: NEMA Type 12 (dust tight) or 13 (Dust and oil tight - heavy duty).

B. Provide enclosures for manual motor starters complying with NEMA Standards and suitable for surface mounting as follows:
   1. NEMA 12

2.5 WIRING DEVICES

A. Acceptable Manufacturers:
   1. Arrow Hart Motor Controls Co.
   2. Eagle Electric Mfg. Co., Inc.
   3. Hubbell Inc.
   4. Leviton Mfg. Co., Inc.
   5. Pass & Seymour/Legrand
   6. Cooper Wiring Devices, a division of Cooper Industries, Inc.

B. Provide factory fabricated wiring devices conforming to NEMA WD 1, unless otherwise indicated.

C. Wall Switches: NEMA heavy duty class; rated at 20 amperes; AC quiet slow make, slow break design; toggle handle with totally enclosed case; mounting yoke insulated from mechanism; back or side wiring, metal plaster ears; brown or gray color.

D. Standard Duplex Receptacles: NEMA heavy-duty class; 2-pole, 3-wire grounding with green hexagonal equipment ground screw; ground terminal and poles internally connected to mounting yoke; rated at 20 amperes, 125 volts; back or side wiring, metal plaster ears; NEMA configuration 5-20R, unless otherwise indicated; brown or gray color.

E. Floor Receptacles: NEMA heavy-duty class; 2-pole, 3-wire grounding; rated at 20 amperes, 125 volts, back to back duplex receptacle; NEMA configuration 5-20R; brown or gray color.

F. Special Purpose Outlets: NEMA heavy-duty class, grounding type, with matching plug.

G. Pilot Light Switches: NEMA heavy-duty class; rated at 20 amperes, 120 or 277 volts; AC quiet design; lighted red polycarbonate (Lexan) toggle handle when switch is in ON position, neon lamp, single pole, back or side wiring.

H. Interior Plate Covers: Stainless Steel, type 302 satin finished, minimum 0.032-inch-thick; accurately die cut and beveled; smooth rolled outer edge for flush mounted boxes edge smoothed to fit surface mounted boxes; with screws to match plate cover finish.

I. Exterior Plate Covers: Die cast aluminum, satin finished, weatherproof, individual spring loaded, gasketed lift lids for devices, corrosion resistant screws to match plate cover finish.

2.6 ELECTRICAL IDENTIFICATION

A. Wire and Cable Markers: Machine printed sleeve or adhesive wrap around type with black non-smear indelible ink. Identification shall be legible with bold, non-faded, distinct characters. Sleeve type markers shall have the marking printed once. Do not heat shrink sleeve markers to allow for the sleeve to be rotated. Adhesive type shall have the marking printed multiple times around the circumference of the wire or cable. Brady Corporation shall manufacture adhesive wrap around type. Replace ink cartridge regularly to maintain clear identification.

B. Nameplates: Laminated plastic with beveled edges; white face ply engraved through to expose contrasting black core ply lettering; 1/16-inch-thick, 5/8-inch-high with 3/8-inch lettering; length as required; punched for riveted fastening.

C. Warning Labels and Signs: Comply with NFPA 70 and 29 CFR 1910.145 and conform to ANSI Z535.4.

PART 3 – EXECUTION

3.1 GENERAL

A. Comply with requirements for Class 1, Division 2 location for building areas where vehicles are parked, in accordance with NFPA 70.

B. Determine exact route or location of all electrical materials prior to installation.

C. Install electrical materials as indicated with offsets, fittings, and changes in elevations as required to make adjustments for obstacles or interferences.

D. Do not allow the installation of electrical materials and conduit routing to cause any mechanical equipment to become unserviceable or inoperable.

E. Do not allow electrical materials to protrude into pedestrian or vehicle paths. Coordinate with Owner's Project Manager.

3.2 CABLE TRAY INSTALLATION

A. At Contractor's option install cable tray system instead of conduit and fittings for horizontal runs in joist and vertical drops and other free-standing panels.

B. Route cable tray system above the bottom chords and below the top chords of steel roof support joists or between glue laminated wood beams wherever possible. Where this is not possible route within 2'-6" of bottom of joist for single tray and within 5'-0" of bottom of joist for double tier tray.

C. Install cable tray system in accordance with manufacturer's installation instructions.

D. Route cable trays parallel or perpendicular to building lines.

E. Maintain minimum of six inches clearance at flues and heat sources.

F. Install system with allowance for expansion and contraction at building expansion joints. Clamp cable trays rigidly only at midpoints between expansion connectors.

G. Install covers on vertical tray runs for the first six feet above motor control panel(s) and main distribution board.

H. Install continuous barrier strips with barrier splice clips in trays to separate power cables from control cables.

I. Ensure cable trays are aligned in a neat uniform manner.

J. Before starting installation, provide Owner's Project Manager with shop drawings indicating cable tray and tray cable runs for approval.

3.3 CONDUIT INSTALLATION

A. Install conduit underground only for service to auxiliary buildings from main building, site lighting, fuel dispensing systems, and other connections to electrical equipment located outside of building.

1. Perform excavation, trenching, backfilling and compaction in accordance with Division 31 - Earthwork.
2. Set the top of concrete encased underground conduit banks a minimum of 1'-6" below finish subgrade, unless otherwise indicated. Whatever the concrete depth, the tops of the conduits shall located below the frost line.
3. Encase the following conduits in concrete of three inches thickness all around:
    a. Main exterior underground electrical and telephone service conduits.
    b. Main exterior underground feeders to vehicle wash facilities.
    c. All underground conduits to fuel islands.

4. All exterior conduits not encased in concrete shall be set with the top of conduits a minimum of 36 inches below finished subgrade or the frost line, whichever is deeper.
5. All exterior underground conduits, whether encased in concrete or not, shall have tracer warning tape installed above conduits, 6 to 12 inches below subgrade.

B. Install conduit and fittings exposed, except conceal conduit and fittings in office complex rooms other than mechanical equipment rooms, and elsewhere as indicated.

C. Route all exposed conduits parallel or perpendicular to building lines.

D. Group runs of conduit wherever possible.

E. Route conduit runs above the bottom chords and below the top chords and steel roof support joist with vertical drops along walls/columns or to equipment as applicable, unless otherwise indicated.

F. Install IMC:
1. For all outdoor power and control devices.
2. For horizontal runs attached to or supported from the underside of the bottom chord of open web steel roof o support joists and below 8 inches of bottom of solid steel roof joist or glue laminated wood roof beams as follows:
   a. For AC three phase power
   b. For AC single phase control

G. Install EMT:
1. For horizontal runs above the bottom chords and below the top chords of open web steel roof or support joists and within eight inches below bottom of solid steel roof joist or glue laminated wood beams as follows:
   a. For AC three phase power
   b. For AC single phase control
   c. For DC control, instrumentation, data, and communication
2. For horizontal runs along walls as follows:
   a. For AC three phase power
   b. For AC single phase control
   c. For DC control, instrumentation, data, and communication
3. For vertical drops down walls and building columns from steel roof or support joist, laminated wood beams or cable tray as follows:
   a. For AC three phase power
   b. For AC single phase control
   c. For DC control instrumentation, data, and communication

4. In office complex rooms and ceilings.
5. Make transition from EMT to IMC conduit where required, along horizontal run at least two feet from vertical drop, transition to be above the bottom chords of open web steel roof or support joists, or within eight inches of bottom of solid steel roof joist or laminated wood roof beams. Transition from EMT to IMC to be made only once per run.

H. Install RGS and fittings in place of IMC, where required by NFPA 70 (e.g., electrically classified areas) or by federal, state, and local governments or agencies having jurisdiction.

I. Install FMC and fittings for motor, lighting connections, and for other equipment connections where subject to movement and vibration.

J. Install liquid tight FMC and fittings for motor and equipment connections in Class 1, Division 2 locations.

K. Install EMT and fittings for all data and telephone installations concealed in walls or above ceilings.

L. Install insulated bushings in open ends of all conduits penetrating enclosures and boxes.

M. Install a locknut on one side and sealing locknut on the other side of a clean knockout (no concentric rings remaining) where penetrating enclosures or boxes with RGS or IMC. Install listed fitting outside and one locknut inside of a clean knockout (no concentric rings remaining) where penetrating enclosures or boxes with EMT.

N. Install grounding locknuts or grounding bushings on all conduits that penetrate enclosures or boxes that contain knockouts with concentric rings remaining. Install bonding jumper wire.

O. Install expansion fittings complete with bonding jumpers where conduits cross building expansion joints.

P. Install smoke and fire stop fittings where conduits pass through fire rated walls and floors. Restore original fire-resistance rating of assembly.

Q. Install sealing and drainage fittings with sealing compound to provide a complete seal, as required for Class 1 locations.

R. Maintain minimum of six inches clearance at flues and heat sources.

S. Install conduits free from dents and bruises. Plug ends to prevent entry of dirt, debris, and moisture during installation.

T. Cut ends of conduit square. Ream ends of field-cut conduit and remove burrs.

U. Join conduit butt-tight in couplings.

V. Ensure conduit is aligned in a neat, uniform manner.

W. Holes drilled into NEMA Type 12 enclosures for conduit entry shall be tightly sealed using sealing locknuts to maintain the NEMA rating of the enclosure.

X. Do not run conduit where the run would expose conduit to damage.

Y. Do not run conduits on the floor.

3.4 WIREWAY INSTALLATION

A. Install wire way only where specifically indicate.

B. Install wire way system in accordance with manufacturer's installation instructions.

C. Install wire way system free from dents and bruises

D. Route wire way parallel or perpendicular to building lines.

E. Maintain minimum of six inches clearance at flues and heat sources.

F. Install wire way system with allowance for expansion and contraction at building expansion joints.

G. Ensure wire way is aligned in a neat uniform manner.

3.5 WIRE, CABLE AND CONECTOR INSTALLATION

A. Install all conductors in raceways, including low voltage wiring, unless otherwise indicated on the drawings. Keep AC power, AC control, DC control and DC instrumentation, data, and communication cable in separate raceways. Do not mix voltage levels within the same raceway.

B. Install copper conductors.

1. Install minimum #12 AWG conductors for AC power circuits and minimum #14 AWG conductors for AC control circuits.
2. Install stranded conductors for all wiring, except solid #10 AWG and #12 AWG copper conductors may be used for lighting and convenience receptacle circuits.
3. Install tray cable in cable trays. Use multi-conductor cable with ground for control circuits and three-conductor cable with ground for power circuits.
    a. Limit the number of cables in cable trays to 80 percent of the maximum allowable cable fill area specified in NFPA 70.
4. Terminate the shield from all shielded cable to ground at one end only: Panel end. Do not terminate shield to ground at the field device.
5. Factory bound multiple conductor bundle or multi-conductor cable may be used in place of individual conductors for conduit system.
6. Install communication cable for computers or other equipment as recommended by the communication equipment manufacturer.

7. Install metal-clad cable (MC) at contractors' option, for runs concealed in walls and ceilings only. No exposed MC cable shall be permitted.

C. Color code conductor insulation as follows:
   1. Control Circuits – Single conductor
      a. 24 Volt, DC
         1) Positive-Blue
         2) Negative-Blue with white spiral tracer
         3) Signal-Blue with red spiral tracer
      b. 120 Volt, AC
         1) Supply-Red
         2) Neutral-White
         3) Ground-Green
   2. Control Circuits – Multi-Conductor system
      a. 120 Volt, AC – Single conductors bound
         1) Multi-conductor system consisting of single insulated conductors, factory bound together to form a bundle. All red supply conductors with white for neutral and green for ground. Each conductor within a bundle shall be factory numbered every 12 inches with no duplication of numbers. Each bundle shall be identified with a unique letter.
      b. 120 Volt, AC – Tray Cable
         1) Multi-conductor system consisting of multiple insulated conductors, factory bound to form a cable. Multiple color supplies conductors with only one white for neutral and only one green for ground. Duplicated colors shall be distinguished with a different colored tracer stripe. Insulated jacket encloses conductors.
      c. 24 Volt, DC – Cable
         1) Multi-conductor system consisting of multiple insulated conductors, factory bound to form a cable. Multiple color conductors. Duplicated colors shall be distinguished with a different factory printed number or a different colored tracer stripe. Insulated jacket encloses conductors.
   3. Power Circuits – Single conductor
      a. 240/120 Volt, Single Phase, 3 Wire System:
         1) Hot Phase A Black
         2) Hot Phase B Red
         3) Neutral White
         4) Switch Leg other than phase wire color.
         5) Ground Green
      b. 208/120 Volt, Three Phase, 4 Wire Wye System:
         1) Hot Phase A- Black
         2) Hot Phase B- Red

3) Hot Phase C- Blue
4) Neutral- White
5) Switch Leg- other than phase wire color.
6) Ground- Green

c. 240/120 Volt, Three Phase, 4 Wire Delta System:
1) Hot Phase A- Orange
2) Hot Phase B- Black
3) Hot Phase C- Blue
4) Neutral- White
5) Ground- Green

d. 480/277 Volt, Three Phase, 4 Wire Wye System:
1) Hot Phase A- Brown
2) Hot Phase B- Orange
3) Hot Phase C- Yellow
4) Neutral- Gray
5) Switch Leg- other than phase wire color.
6) Ground- Green

e. 480 Volt, Three Phase, 3 Wire System:
1) Hot Phase A- Brown
2) Hot Phase B- Orange
3) Hot Phase C- Yellow
4) Ground- Green

4. Power Circuits – Multi-Conductor system
a. 208, 240, 480, 600 Volt – Tray Cable
1) Multi-conductor system consisting of multiple insulated conductors, factory bound to form a cable. All black conductors. Each conductor shall be distinguished with a different factory printed number. Insulated jacket encloses conductors.

5. For all conductors, AC and DC, the insulation color and factory printed number, if applicable, shall be maintained throughout the entire length. Do not change color or number at termination points, terminal blocks, distribution blocks or splices.

D. Install spare conductors as needed.

E. Bundle spare conductors at each location with nylon ties. Wrap the end of the bundle with electrical tape. Do not terminate any spares on empty terminal blocks.

F. Clean raceways of dirt and debris and remove moisture prior to installation of conductors. Do not install conductors in raceways until raceways have been fully installed and aligned.

G. Make conductor length for parallel feeders identical.

H. Keep conductors off ground and floor; wipe conductors clean as they are installed in raceways.

I. Lace or clip groups of feeder conductors at distribution centers, and pull and junction boxes.

J. Installation in Cable Trays:

1. Contractor to utilize existing horizontal cable trays where applicable and install new tray at Contractor's option for AC power and control, DC control, instrumentation, data, and communication cable. Install AC power and AC control in the same tray. Install barrier strips with splice clips in new and existing tray along the entire length to separate AC power and AC control cable. Install DC control, instrumentation, data, and communication cable in separate tray. Do not install barrier strips in tray that contains only power cable or in tray that contains only control. Do not install barrier strips in any unused trays.
2. Securely fasten cable to cross rungs with nylon ties at intervals not to exceed eight feet for horizontal tray runs, and four feet for vertical tray runs.
3. Cable to be continuous. Splice cable only if a splice or tap is required as indicated on the drawings. Do not splice or tap within tray.
    a. Power cable may be spliced or tapped by connecting to terminal or distribution blocks within terminal or distribution boxes located at tray elevation or below. Make transition between tray cable and individual conductors at this location.
    b. Control cable may be spliced or tapped by connecting to terminal blocks within terminal or distribution boxes located within 10 feet of finished floor. Make transition between tray cable and individual conductors at this location.

K. Installation in Conduit:

1. Pull conductors together where more than one is being installed in a conduit.
2. Use pulling means which cannot damage conductor or insulation.
3. Use pulling lubricant for pulling wire and cable. Lubricant must not deteriorate the conductor or insulation.
4. All AC power and control wires and low voltage DC cables to be continuous without splices unless a splice is required as indicated on the drawings. Splice or tap conductors only in accessible pull and junction boxes that are located within 10 feet of finished floor except for motor terminations at motor conduit box. Do not splice at joist elevation.
5. Install AC power conductors, AC control conductors, DC control conductors and instrumentation, data, and communication cable in separate conduits. Do not mix voltage levels within the same conduit.

L. Installation in Wire way:
    1. All AC power and control wires and low voltage DC cables to be continuous without splices unless a splice is required as indicated. Splice or tap conductors within wire way.
    2. Install AC power conductors, AC control conductors, DC control conductors and instrumentation, data, and communication cable in separate wire way.
    3. AC power and control conductors may only be run within the same wire way provided that a continuous full depth barrier strip is installed along the entire length, the insulation rating is the same and the power and control is functionally associated.

M. Install splice and terminal connectors which have mechanical strength and insulation rating equivalent-or-better than conductor.
    1. Tape uninsulated connectors with electrical insulating tape to 150 percent of the insulation rating of conductor.

N. Install split bolt mechanical connectors for copper conductor splices, #6 AWG and larger, or for multiple taps use terminal or distribution blocks.

O. Install twist-on connectors for copper conductor splices, #8 AWG and smaller for five or fewer splices. Limit the number of conductors per twist-on connector to three. For more than five splices install terminal or distribution blocks for connectors in terminal or distribution boxes.

3.6 BOX INSTALLATION

A. Locate boxes to allow accessibility after completion of construction.

B. Locate pull and junction boxes in office complex rooms, either above removable ceilings or in mechanical equipment rooms and as shown on drawings.

C. Locate lighting outlet boxes above ceilings in office complex rooms.

D. Mount outlet boxes flush in office complex rooms other than mechanical equipment rooms, unless otherwise indicated.

E. Rigidly fasten boxes or solidly embed boxes in concrete.

F. Securely anchor floor fittings to floor boxes. Where floor fittings are mounted on conduit floor stubs, provide independent anchorage to floor to prevent fitting movement.

G. Size all junction and pull boxes in accordance with national state and local codes.

H. Rigidly fasten boxes or solidly embed boxes in concrete or masonry as applicable

I. Do not install round boxes where conduit must enter side of box.

J. Install knockout closure to cap unused knockout holes where blanks have been removed.

K. Support terminal and distribution boxes at cable tray from roof joist independent of cable tray supports. Locate boxes to allow accessibility after completion of construction.

3.7 WIRING DEVICE INSTALLATION

A. Clean dirt and debris from electrical boxes and remove moisture prior to installing wiring devices.

B. Mount switches vertically with bottom of box 48 inches above floors and platforms, unless otherwise indicated.

C. Provide electrically continuous, tight grounding connections for wiring devices, unless otherwise indicated.

D. Install interior plate covers on electrical and telephone/data receptacles, outlets, and wall switches.

E. Install exterior plate covers on exterior wiring devices.

3.8 ELECTRICAL IDENTIFICATION INSTALLATION

A. Tag the jacket of control circuit multi-conductor tray cable and control, instrumentation, data, and communication cables at all termination points, terminal blocks, distribution blocks, and splices, including pull and junction box splices, using cable markers identifying the name or names of the load served as designated on the drawings.

B. Tag individual control circuit conductors at all termination points, terminal blocks, distribution blocks, and splices, including pull and junction box splices, using wire and cable markers with identification numbers or names as designated on the drawings.

C. Tag all black power circuit conductors from multi-conductor cable at all termination points, terminal blocks, distribution blocks, and splices, including pull and junction box splices, using colored tape consistent with the insulation color code for the appropriate voltage level as described within Item 3.5 of this specification. Wrap each conductor with a minimum of two layers of tape.

D. Identify spare conductors individually, at both ends, and at junction box splices with numbers between 1 and 999. Do not duplicate numbers. Label as: "Spare From _____ To _____." Fill in the blanks with the appropriate locations.

E. Identify wire numbers on terminal block marking strips. Use identification numbers.

F. Identify control, disconnects, contactors, and panel boards with laminated plastic nameplates corresponding to designation of equipment. Attach nameplates with rivets. Coordinate designations Owner's Project Manager.

3.9 FIELD QUALITY CONTROL

A. Upon completion of installation of electrical systems, perform testing as follows:
   1. Ensure all equipment connections, are torqued according to the manufacturer's specifications prior to energizing.
   2. Perform Megger test of all feeders and branch circuits with over current protection at 100 Amps and larger. Record all measurements and report all findings to the Owner's Project Manager. Conductors with test results below the minimum insulation resistance values provided by the insulated power cable engineers association (IPCEA) shall be re-pulled.

B. Subsequent to tests and correction of malfunctions detected, energize circuitry and demonstrate functioning of electrical systems in accordance with requirements. Demonstrate proper rotation of all motors.
   1. Correct motor rotation only at the motor terminal box.

C. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes requirements and specifications pertaining to:

1. Protection of existing trees, vegetation, landscaping, and site improvements not scheduled for clearing that might be damaged by construction activities.
2. Trimming of existing trees and vegetation as recommended by arborist for protection during construction activities.
3. Clearing and grubbing of stumps and vegetation; removal and disposal of debris, rubbish, designated trees, and site improvements.
4. Topsoil stripping and stockpiling on-site.
5. Topsoil stripping and removal from site.
6. Temporary erosion control, siltation control, and dust control.
7. Temporary protection of adjacent property, structures, benchmarks, and monuments.
8. Temporary relocation of fencing and site improvements scheduled for reuse.
9. Watering of trees and vegetation during construction activities.
10. Removal and legal disposal of cleared materials.

1.2 RELATED SECTIONS

A. Section 024100 - Demolition

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Use experienced workers
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1.4 DEFINITIONS

A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.

D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.

G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.

C. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

D. Do not direct vehicle or equipment exhaust towards protection zones.

E. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

F. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Tree protection, erosion control, siltation control, and dust control materials suitable for site conditions.

PART 3 – EXECUTION

3.1 PREPARATION/GENERAL

A. Prevent damage to existing improvements indicated to remain, including improvements on and off site

B. Protect existing trees and vegetation indicated to remain.

C. Do not stockpile materials.

D. Do not permit traffic within drip line of existing trees to remain. Provide and maintain temporary guards to encircle trees or groups of trees to remain, whether or not irrigation system is removed or inoperable.

E. Protect and maintain benchmarks and survey control points from disturbance during construction.

3.2 CLEARING

A. Strip topsoil to depths required. Remove heavy growths before stripping.

B. Completely remove all improvements including stumps and debris except for those indicated to remain. Remove below grade improvements at least 12 inches below finish grade and to the extent necessary so as not to interfere with new construction. Use only hand methods for grubbing within protection zones.

C. Remove abandoned mechanical and electrical work as required. See Section 024100 – Demolition for additional requirements

D. Prevent erosion and siltation of streets, catch basins and piping, according to the Illinois Urban Manual (Current Edition),. Control windblown dust. See Section 312513 - Erosion and Sedimentation Control for additional requirements

E. Minimize production of dust due to clearing operations; do not use water if such use will result in ice, flooding, sedimentation of public waterways or storm

sewers, or other pollution, according to the Illinois Urban Manual (Current Edition),

F. Remove waste materials and unsuitable soil from site and dispose of this material in a legal manner.

G. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

3.3 EXISTING UTILITIES AND BUILT ELEMENTS

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits. Notify JULIE for area where Project is located before site clearing.

B. Protect existing utilities to remain in service, whether on or off-site.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are not to be removed.

E. Fencing and other improvements scheduled for reuse shall be stored in a secure area and protected until reinstalled.

F. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

G. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner’s written permission.

H. Removal of underground utilities is included in earthwork sections and in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections.

3.4 VEGETATION

A. Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, lawns, and planting beds.

B. Do not begin clearing until vegetation to be relocated has been removed.

C. Do not remove or damage vegetation beyond indicated limits:

1. 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
2. 15 feet each side of roadway curbs and main utility trenches.
3. 25 feet outside perimeter of pervious paving areas that must not be compacted by construction traffic.
4. Exception: Specific trees and vegetation indicated on drawings to be removed.
5. Exception: Selective thinning of undergrowth specified.

D. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated. Use only hand methods for grubbing within protection zones.

6. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
7. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
8. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.

E. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush on entire site; treat as specified for vegetation removed.

F. Water vegetation as required to maintain health. Cover temporarily exposed roots with wet burlap and backfill as soon as possible. Coat cut plant surfaces with approved emulsified asphalt plant coating.

G. Repair or replace vegetation which, has been damaged. Remove heavy growths of grass before stripping.

H. Restoration: Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

I. If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

3.5 DISPOSAL AND BURNING

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property in accordance with Article 202.03 of the Illinois Department of Transportation (IDOT) Standard Specifications.

B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store without intermixing with other materials and

transport recyclable materials to recycling facilities. Do not interfere with other Project work.

C. Open burning will not be permitted.

END OF SECTION

SECTION 312513

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide stone riprap for slope protection over prepared subgrade.

B. Provide mud/silt retaining systems.

C. Provide erosion control matting.

D. Stormwater monitoring.

1.2 RELATED SECTIONS

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used, including:

B. Types of stone and sizes.

C. Types of fabrics and erosion control matting.

D. Seeding

E. Sodding

F. Netting

1.4 QUALITY ASSURANCE

A. Comply with governing codes and regulations. Provide products of acceptable manufacturers that have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturers' instructions.

B. The Owner will routinely inspect the erosion control measures installed by the Contractor and shall issue stop work orders if any of these measures are found incomplete or improperly installed. In addition to the Owner's inspections, the Contractor will perform inspections to ensure adequate erosion and sedimentation controls in accordance with State and Local Permit

requirements.

1.5 REFERENCES

A. Any Soil and Sediment Control Ordinances in force by the local Governments
B. State of Illinois Department of Transportation, Standard Specifications

1.6 PERFORMANCE REQUIREMENTS

B. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the most current Construction General Permit (CGP). Also comply with any updates required but not listed, whether the project is required by law to comply or not.

C. Also comply with all more stringent requirements of State of Illinois Erosion and Sedimentation Control Manual.

D. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

E. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
   1. Obtain and pay for permits and provide security required by authority having jurisdiction.

F. Erosion on Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this Project.
   1. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

G. Sedimentation of Waterways on Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

H. Discharge Monitoring: Monitor discharges as required and where required.

H. Use of erosion and sedimentation control measures shall be included in all permanent construction work and temporary construction work outside the rights-of-way where necessary as a result of construction operations, such as haul roads and equipment storage sites.

I. The erosion and sedimentation controls shown on the Drawings and included in these Specifications are minimal requirements. The contractor's methods of construction may require additional erosion and sedimentation controls not indicated on the drawings or in these Specifications.

J. The Contractor shall be solely responsible for control of erosion within the Project site and prevention of sedimentation in any adjacent waterways.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Crushed stone bedding two feet thick, with filter fabric, and mechanically-placed one-foot-thick stone riprap.

B. Retaining Wall Systems: Modular retaining wall system by Keystone or Risi Stone.

C. Erosion Control Matting: By Forestry Suppliers, Contech Engineered Solutions or locally approved DOT materials of the following:

1. Nonwoven polyester geotextile.
2. Polyvinyl chloride non-woven mat.
3. Nylon geomatrix.

D. Temporary Erosion Control Materials

1. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   a. Average Opening Size: 30 U.S. Std. Sieve (0.600 mm) maximum when tested in accordance with ASTM D 4751.
   b. Permittivity: 0.05 sec^-1 minimum when tested in accordance with ASTM D 4491.
   c. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength when tested in accordance with ASTM D 4355 after 500 hours' exposure.
   d. Tensile Strength: 100 lb-f (450 N) minimum in cross-machine direction and 124 lb-f (550 N) minimum in machine direction; when tested in accordance with ASTM D 4632.
   e. Elongation: 15 to 30 percent, when tested in accordance with ASTM D 4632.

f. Tear Strength: 55 lb-f (245 N) minimum when tested in accordance with ASTM D 4533.

g. Color: Manufacturers' standard, with embedment and fastener lines preprinted.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install materials and systems in accordance with manufacturers' instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.

B. Land disturbance activity shall not commence until the Land Disturbance Permit has been obtained by the Owner, provided that a permit is required for the project.

3.2. EROSION CONTROL

C. Minimum procedures for grassing are:

1. Scarify slopes to a depth of not less than 6" and remove large clods, rock, stumps, roots larger than 1/2" in diameter and debris.
2. Sow seed within 24 hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.
3. Apply mulch loosely and to a thickness of between 3/4" and 1-1/2".
4. Apply netting over mulched areas of sloped surfaces.
5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit un-satisfactory growth. Backfill and seed eroded areas.

3.3 SEDIMENTATION CONTROL

D. Install and maintain silt fencing, silt dams, traps, barriers and appurtenances as shown on the approved descriptions and working drawings. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.4 PERFORMANCE

E. Should any of the temporary erosion and sediment control measures employed fail to produce results which comply with the requirements of the State, immediately take whatever steps are necessary to correct the deficiency.

END OF SECTION

SECTION 313000
EARTHWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes requirements for excavation, trenching, filter fabric, back-filling, filling, compaction and grading.

1.2 RELATED SECTIONS

A. Section 260500 – Common Work Results for Electrical Systems

1.3 REFERENCE STANDARDS

A. AASHTO M147 – Standard Specifications for Materials for Aggregate and Soil Aggregate Sub-base, Base and Surface Courses; current edition.

B. AASHTO T 180 – Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; current edition.

C. ASTM C 33 – Standard Specifications for Concrete Aggregates; current edition.

D. ASTM C 136 – Standard Test Method for Sieve Analysis of Fine & Coarse Aggregates; current edition.

E. ASTM D 26 – Standard Specifications for Tensile Testing Machine for Textiles; current edition.

F. ASTM D 1557 – Standard Test Methods for Laboratory Compaction characteristics of Soil Using Modified Effort (56,000 Ft – bf/ft3); current edition.

G. ASTM D 1777 – Standard Test Methods for Thickness of Textile Materials; current edition.

H. ASTM D 2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); current edition.

I. ASTM D 2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); current edition.

J. ASTM D 2940 – Standard Specifications for Graded Aggregate Materials for Bases or Subbases for Highway or Airport; current edition.

K. ASTM D 3776 –Standard Test Methods for Mas Per Unit Area (Weight) of Fabrics; current edition.

L. ASTM D 4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculations for Relative Density; current edition.

M. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; current edition.

1.4 UNIT PRICE FOR UNSUITABLE SOIL MATERIALS

1. The Owner's Project Manager exclusively shall make the determination of unsuitable soil materials.
2. Excavation, replacement and disposal of unsuitable soil materials, if any, shall be considered additional work to that indicated on the Drawings, specified, or reasonably inferred by the Contract Documents and, by appropriate change order, be charged to the Owner and the cost to Owner shall be determined in the manner provided in the General Conditions.
3. Measurement of the quantity of unsuitable soil materials shall be accurately made by Contractor and verified by the Owner's Project Manager.
4. The quantity of unsuitable soil materials excavated, replaced and disposed of shall, for payment purposes, be the actual volume of the excavation, calculated from grades determined before and after the work at the excavation area.
5. Excavation required by the Contract Documents and excavation, replacement or disposal of soil materials required because of Contractor's failure to comply with the Contract Documents shall not be compensated as unsuitable soil materials.

1.5 PROJECT CONDITIONS

A. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations. Do not use explosives.

1.6 MAINTENANCE/OPERATION

A. Do not allow water to accumulate in excavations or graded areas.

B. Protect graded areas from traffic and erosion. Repair and reestablish grades in settled, eroded, and rutted areas.

C. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, remove and replace or scarify soil materials, reshape, and re-compact to specified density prior to further construction.

PART 2 – PRODUCTS

2.1 BACKFILL AND FILL MATERIALS

A. Unless other materials are specifically indicated for backfilling and filling, use soil materials excavated from site or Common Fill Materials specified herein.

B. Untreated aggregate base material (Meet ASTM D 2940)

Requirements	Test Results
CBR min	80
Liquid Limits (max)	25
Passing #200 Sieve (min)	7
Sand Equivalent (min)	35
Opt Moisture by wt.	1.5% +/-
Minimum density	100%

C. Select Fill Under Interior Floor Slabs-On-Grade: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2 inch sieve and not more than five percent passing a No. 4 sieve.

D. Sand Backfill: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter.

E. Sand - Fill Type: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, and organic matter.
   1. Grade in accordance with ASTM D 2487 Group Symbol SW.
   2. Graded in accordance with ASTM C 136; within the following limits:

F. Pea Gravel Backfill: Naturally rounded stone, 1/8 inch minimum to 3/4 inch maximum size; free of clay, shale and organic matter.
   1. Grade in accordance with ASTM D 2487 Group Symbol GM.
   2. Graded in accordance with ASTM C 136, within the following limits:

G. Stone Crushings for Fiberglass Underground Fuel Tanks and Piping: Free flowing crushed stone; 1/8 inch minimum size to 1/2 inch maximum size; washed, free of clay, shale and organic matter; complying with ASTM C 33, paragraph 9.1 requirements, except particles passing a #8 sieve are not permitted.

H. Crushed Stone for Underdrains and Under Manhole: Washed natural stone; crushed or uncrushed; 3/4 inch minimum to one inch maximum size; free of clay, shale, sand, debris and organic matter.

I. Rip Rap: Washed natural stone; crushed or uncrushed; with 100% passing a 12 inch sieve, 30% to 50% passing a six inch sieve, and 0% passing a three inch sieve; free of clay, shale, sand, debris and organic matter.
   1. Render all backfill and fill materials free of rock or gravel larger than two inches in any dimension, debris, waste, frozen parts, vegetation and other deleterious matter.

J. Granular Fill – in accordance with AASHTO M147, with a liquid limit of not more than 25 and a plasticity index of not more than 5 in accordance with ASTM D 4318.

K. Topsoil - Fill Type: Topsoil excavated on-site.
   1. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter.
   2. Conforming to ASTM D2487 Group Symbol OH.

2.2 FILTER FABRIC

A. Filter fabric shall be of nonwoven needle punched construction composed of polypropylene, polyethylene or polyamide fibers. The fabric should free of any chemical treatment or coating, allow the passage of water and be inert to chemicals commonly found in soil.

B. Acceptable Manufacturers
   1. US Fabrics Inc. 800-518-2290
   2. Tencati/Mirafi 706-693-4000
   3. IDOT Specification

C. Products:
   1. Filter Fabric (for underdrains and other drainage use) shall be a non-woven pervious geotextile fabric that meets the following requirements:
      a. Weight (ASTM D 3776): 4.5 ounces per square yard.
      b. Thickness (ASTM D 1777): 60 mils.
      c. Grab Tensile Strength (ASTM D 76): 120 pounds.
      d. Grab Elongation (ASTM D 76): 55%.
      e. Flow Rate (CFMC-GET-2): 285 gallons per minute per square foot.

PART 3 - EXECUTION

3.1 GENERAL

A. The elevations shown on the Drawings as existing are taken from the best existing data and are intended to give reasonable, accurate information about the existing elevations. They may not be exact, and the Contractor must satisfy himself as to the exact quantities of excavation and fill required.

B. Earthwork operations shall be performed in a safe and proper manner with appropriate precautions being taken against all hazards.

C. All excavated and filled areas for structures, trenches, fills, topsoil areas, embankments and channels shall be maintained by the Contractor in good condition at all times until final acceptance by the Owner. All damage caused by erosion or other construction operations shall be repaired by the Contractor using material of the same type as the damaged material.

D. The Contractor shall control grading in a manner to prevent water running into excavations. Obstruction of surface drainage shall be avoided and means shall be provided whereby storm water can be uninterrupted in existing gutters, other surface drains, or temporary drains. Free access must be provided to all fire hydrants, valves, and meters.

E. Tests for compaction and density shall be conducted by an independent testing laboratory selected by the Owner's Project Manager. Costs of compaction tests performed by an independent testing laboratory shall be paid for by the Owner. The Contractor shall make all necessary excavations and shall supply any samples of materials necessary for conducting compaction and density tests. The cost of all retests made necessary by the failure of materials to conform to the requirements of these Contract Documents shall be paid by the Contractor.

F. All earthwork operations shall comply with the requirements of OSHA Construction Standards, Part 1926, Subpart P, Excavations, Trenching, and Shoring, and Subpart O, Motor Vehicles, Mechanized Equipment, and Marine Operations, and shall be conducted in a manner acceptable to the Owner and the Owner's Project Manager.

G. It is understood and agreed that the Contractor has made a thorough investigation of the surface and subsurface conditions of the site and any special construction problems which might arise as a result of nearby watercourses and floodplains, particularly in areas where construction activities may encounter water-bearing sands and gravels or limestone solution channels. The Contractor shall be responsible for providing all services, labor, equipment, and materials necessary or convenient to him for completing the work within the time specified in these Contract Documents.

3.2 PREPARATION

A. The Contractor shall protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

B. The Contractor shall protect subgrades and foundation soils against freezing temperatures or frost and provide protective insulating materials as necessary.

C. The Contractor shall provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 EXCAVATION

A. Excavate site materials to establish required elevations.

B. Excavate trenches for piping and conduit to the uniform width required for six to nine inches clearance on both sides of pipe or conduit, except where additional width is required for proper installation of joints, fittings, valves and other work, and except where otherwise indicated.

C. Carry depth of trenches for piping to establish indicated flow lines and invert elevations.

D. Excavate for electrical conduit so that top of conduit will not be less than NEC standard vertical distance below finished grade.

E. Trim bottoms of excavations to leave solid base to receive other work. Keep excavation bottoms clean and clear of loose materials.

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

G. Correct unauthorized excavation in a manner acceptable to Owner's Project Manager, at no cost to Owner.

3.4 FILTER FABRIC INSTALLATION

A. Line excavations with filter fabric where indicated on drawings.

B. Overlap adjoining fabric panels at least 18 inches.

3.5 BACKFILLING AND FILLING

A. Place specified backfill and fill materials in layers to establish required elevations.

B. Do not place backfill or fill materials on surfaces that are muddy, frozen, or contain frost or ice.

C. Remove rock or gravel larger than two inches in any dimension, debris, waste, obstructions, and deleterious matter from ground surface prior to placement of fills.

D. Plow, strip, or break-up sloped surfaces steeper than one vertical to four horizontal (1V:4H) so that fill materials will bond with existing surface.

E. When existing ground surface has a density less than that specified herein under "Compaction", break up ground surface, pulverize, moisture-condition to

optimum moisture content, and compact to specified depth and percentage of maximum density or relative density.

F. Place backfill and fill materials in layers not more than eight inches in loose depth for material compacted by heavy compaction equipment, and not more than four inches in loose depth for material compacted by hand-operated tampers.

G. Place backfill and fill materials uniformly around structures, materials and equipment to approximately same elevation in each lift.

H. Completely fill and compact under piping and conduit. Shape fill to fit bottom 90 degrees of cylinder. Support piping and conduit during placement and compaction of bedding fill.

I. Moisten or aerate each layer of backfill or fill prior to compaction as necessary to provide optimum moisture content. Compact each layer to specified percentage of maximum density or relative density.

J. Granular Fill: Place and compact materials in equal continuous layers not exceeding six inches compacted depth.

K. Soil Fill: Place and compact material in equal continuous layers not exceeding eight inches compacted depth.

L. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, and similar construction: 97% of maximum dry density.
   2. At other locations: 95% of maximum dry density.

3.6 COMPACTION

A. Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D 1557; method and not less than the following percentages of relative density, determined in accordance with ASTM D 4254, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils):
   1. Under Buildings (including future) and Paving Areas: Compact existing ground surface and each layer of backfill or fill material to 95 percent maximum density. Contractor to compact layers in no greater than 8” lifts.
   2. Other Areas: Compact existing ground surface and each layer of backfill or fill material to 90 percent maximum density. Contractor to compact layers in no greater than 8” lifts.

B. Where soil materials must be moisture conditioned before compaction, uniformly apply water to surface. Prevent free water from appearing on surface of soil materials during or subsequent to compaction operations.

C. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

D. Compact soil materials around piping and conduit with hand-operated tampers.

E. Coordinate with Section 260500 – Common Work Results for Electrical Systems, burial requirement minimum 1'-6" below finish grade for conduit.

F. Do not allow heavy vehicles, equipment or machinery to operate directly over piping and conduit until a minimum of 18 inches of backfill has been placed and compacted.

3.7 PROOF ROLLING

A. Proof roll site after the top 12 inches of the sub-grade have been shaped and compacted to specifications. Sub-grade should be at or near optimum moisture content.

B. For soil type(s) A-3, A-4, A-6, and A-7, use 35 ton roller with a tire pressure of 120 psi. For granular soils or soil, rock, and granular mixtures, use 50 ton roller with 150 psi tire pressure.

C. The sub-grade area where the proof rolling has taken place is considered "Failed" based on the following:

1. New Construction
    a. Permanent rutting in excess of 1 inch.
    b. Elastic (rebound) movement or rutting is in excess of one inch with substantial cracking or sustainable lateral movement.
2. Reconstruction
    a. Permanent rutting in excess of ½ inch.
    b. Elastic (rebound) movement is in excess of ½ inch with substantial cracking or sustainable lateral movement.

D. Soil excavated as a result of proof rolling shall be considered "Unsuitable" as determined by the Owner's Project Manager and is to be excavated, replaced and disposed off-site, if Owner's Project Manager so directs.

3.8 GRADING

A. Grade site to establish required elevations.

3.9 MOISTURE CONTROL

A. The site shall be kept free of surface water at all times. The Contractor shall install drainage ditches and dikes and shall perform all pumping and other work necessary to divert or remove rainfall and other accumulations of surface water from the excavations. The diversion and removal of surface water shall be

performed in a manner that will prevent the accumulation of water within the construction area where it may be detrimental.

B. Where groundwater is encountered, the Contractor shall make the effort necessary to secure a dry excavation. In sandy and in other suitable type soils, dewatering shall be done by well pointing. If, in the opinion of the Owner's Project Manager, the Contractor has failed to obtain an absolutely dry excavation by insufficient use of all known methods of dewatering, the Owner's Project Manager may require the Contractor to excavate below grade and place not less than six inches of graded crushed stone fill material over the bottom to form french drains to suitably located sumps and to remove the water by bailing or pumping. The graded crushed stone fill material shall be placed at the Contractor's own expense and shall be of such depth that there shall be no water in the excavation at the time of pouring concrete.

3.10 UNSUITABLE SOIL MATERIALS

A. Excavate, replace and dispose of site soil materials determined to be unsuitable by Owner's Project Manager, if Owner's Project Manager so directs.

B. Replace unsuitable soil materials with Common Fill Materials specified and backfill, compact and grade the replacement materials as specified herein.

C. Dispose of unsuitable soil materials off site.

3.11 TOLERANCES

A. Perform earthwork operations to establish required elevations and dimensions within the following tolerances, except that no tolerance will be permitted that would allow a lesser size than indicated for footings and foundations or a lesser thickness than indicated for paving, paving base courses and concrete floor slabs-on-grade.

1. Under Buildings and Paving Areas: Plus or minus 1/2 inch.
2. Other Areas: Plus or minus 1 inch.

3.12 FIELD QUALITY CONTROL

A. Owner will furnish testing and inspection services during earthwork operations. Such services will include general inspections of earthwork operations, testing of fill materials and compaction, and inspection of excavations to such extent as determined by Owner's Project Manager.

3.13 REMOVAL

A. Remove excess excavated material, rock and gravel, debris, waste, vegetation and deleterious matter from earthwork operations and dispose of off-site.

END OF SECTION

SECTION 32 1313

CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roadways.
2. Parking lots.
3. Curbs and gutters.
4. Sidewalks.

B. Related Requirements:
1. Section 312000 "Earth Moving" for subgrade preparation, fill material, and aggregate subbase and base courses.
2. Section 321216 "Asphalt Paving" for hot-mix asphalt paving.

1.2 SUBMITTALS

A. Portland Cement Concrete (PCC) mix designs.

B. Quality Control Plan in accordance with IDOT Check Sheet #23 *Recurring Special Provision for Quality Control/Quality Assurance of Concrete Mixtures*.

C. Material Certificates:

1. Aggregates.
2. Cement
3. Concrete Admixtures

1.3 QUALITY ASSURANCE

D. Comply with materials, workmanship, and other applicable requirements of Section 420 of the *IDOT Standard Specifications*.

PART 2 - PRODUCTS

2.1 PORTLAND CEMENT CONRETE

A. In accordance with Article 1020 of the *IDOT Standard Specifications*.

2.2 STEEL REINFORCEMENT

A. Reinforcement Bars and Welded Wire Reinforcement: In accordance with Article 1006.10 of the *IDOT Standard Specifications*.

B. Dowel Bars and Dowel Bar Assembly: In accordance with Article 1006.11 of the *IDOT Standard Specifications*.

2.3 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: In accordance with Article 1001 of the *IDOT Standard Specifications*.
2. Finely Divided Minerals: In accordance with Article 1010 of the *IDOT Standard Specifications*.

B. Coarse Aggregates: In accordance with Article 1004 of the *IDOT Standard Specifications*.

C. Fine Aggregates: In accordance with Article 1003 of the *IDOT Standard Specifications*.

D. Concrete Admixtures: In accordance with Article 1021 of the *IDOT Standard Specifications*.

E. Water: In accordance with Article 1002 of the *IDOT Standard Specifications*.

2.4 CONCRETE CURING MATERIALS

A. In accordance with Article 1022 of the *IDOT Standard Specifications*.

2.5 RELATED MATERIALS

B. Joint Fillers: Hot-poured joint sealer in accordance with Article 1050.02 of the *IDOT Standard Specifications*.

2.6 CONCRETE MIXTURES

A. In accordance with Article 1020 of the *IDOT Standard Specifications* and complying with the following requirements:

1. Curbs and Gutters, Sidewalks, and Miscellaneous Concrete: Class SI Concrete.

2. PCC Pavements and Parking Lots: Class PV Concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll prepared aggregate base course to identify unsuitable materials and areas of excess yielding.

3.2 PREPARATION

B. Remove loose material from compacted aggregate base course surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

C. Comply with requirements of Article 420.06 of the *IDOT Standard Specifications*.

3.4 STEEL REINFORCEMENT INSTALLATION

A. Comply with applicable requirements in Article 420 of the *IDOT Standard Specifications*.

3.5 JOINTS

A. Construct longitudinal sawed joints, longitudinal construction joints, transverse contraction joints, and transverse expansion joints in accordance with Article 420.05 of the *IDOT Standard Specifications* and installed as indicated within the Contract Plans and Details.

B. Joint spacing shall be no larger than 12 feet by 12 feet within the fuel island pavement.

3.6 CONCRETE PLACEMENT

A. Concrete placement shall be in accordance with Article 420.07 of the *IDOT Standard Specifications*.

3.7 FINISHING

A. General: Concrete finishing shall be in accordance with Article 420.09 of the *IDOT Standard Specifications*. Do not add water to concrete surfaces during finishing operations.

1. Final finish shall be Type B in accordance with Article 420.09(e)(2) of the *IDOT Standard Specifications*.

3.8 CONCRETE PROTECTION AND CURING

B. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Concrete curing shall be in accordance with Articles 1020.13 and 1022 of the *IDOT Standard Specifications*.

3.9 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Owner.

B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement (or until full compressive strength is achieved). When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

3.10 FIELD QUALITY CONTROL

D. All Quality Control is to be the responsibility of the Contractor and shall be in accordance with IDOT Check Sheet #23 *Recurring Special Provision for Quality Control/Quality Assurance of Concrete Mixtures*.

END OF SECTION

SECTION 321216

ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hot-mix asphalt paving.

B. Related Requirements:
1. Section 312000 "Earth Moving" for subgrade preparation, fill material, and aggregate subbase and base courses.
2. Section 321313 "Concrete Paving" for concrete pavement and for separate concrete curbs, gutters, and sidewalks.

1.2 SUBMITTALS

A. Hot-Mix Asphalt (HMA) mix designs.

B. HMA Paving Quality Control Plan in accordance with Article 1030.06 of the *IDOT Standard Specifications*.

C. Material Certificates:

1. Aggregates.
2. Asphalt binder.
3. Tack coat.

1.3 QUALITY ASSURANCE

A. Comply with materials, workmanship, and other applicable requirements of Section 406 of the *IDOT Standard Specifications*.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Coarse Aggregate: In accordance with Article 1004.03 of the *IDOT Standard Specifications.*

B. Fine Aggregate: In accordance with Article 1003.03 of the *IDOT Standard Specifications.*

C. Mineral Filler: In accordance with Article 1011 of the *IDOT Standard Specifications.*

2.2 ASPHALT MATERIALS

A. Asphalt Binder: PG 64-22 asphalt binder in accordance with Article 1032 of the *IDOT Standard Specifications*.

B. Tack Coat: SS-1 in accordance with Article 1032 of the *IDOT Standard Specifications*.

2.3 MIXES

A. Hot-Mix Asphalt: In accordance with Article 1030 of the *IDOT Standard Specifications* and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Binder Course: IL-19.0, N50
3. Surface Course: IL-9.5, N50, Mix 'D'

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

A. Ensure that prepared subgrade is ready to receive paving. Immediately before placing hot-mix asphalt, remove loose and deleterious material from substrate surfaces.

B. Tack Coat: Applied in accordance with Article 406.05 of the *IDOT Standard Specifications*.

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.2 HOT-MIX ASPHALT PLACEMENT

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted. All placement to be in accordance with Section 406 of the *IDOT Standard Specifications*.

1. Place hot-mix asphalt binder course and surface course to thicknesses indicated. Minimum lift thicknesses in accordance with Article 406.06 of the *IDOT Standard Specifications*.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at a minimum temperature of 250 deg F.
4. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.3 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course. All joints to be in accordance with Article 406.06 of the *IDOT Standard Specifications*.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
3. Offset transverse joints, in successive courses, a minimum of 24 inches.

3.4 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Compaction to be in compliance with Article 406.07 of the *IDOT Standard Specifications*.

B. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

C. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.5 FIELD QUALITY CONTROL

A. All Quality Control is to be the responsibility of the Contractor and shall be in accordance with QC/QA method in Article 1030.09 of the *IDOT Standard Specifications.*

END OF SECTION

SECTION 335616

UNDERGROUND FUEL STORAGE TANKS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This section includes requirements and specifications for the following:
   1. Installation of underground fuel storage tank(s) (UST) and piping sumps.
   2. Installation of piping, flexible connectors and connector jackets, pumps, dispensers, accessories, manholes, automatic overfill prevention system, observation wells, and all other component parts reasonably incidental to providing a complete fuel dispensing system.
   3. Installation of underground tank monitoring system.

B. Excavation, trenching, backfilling and compaction for fuel storage tanks and piping: Refer to Division 313000 – Earthwork.
   1. Fuel storage tank inserts and anchorages to be embedded in concrete.

1.2 RELATED SECTIONS

A. Section 017000 – Executing Requirements

B. Section 313000 – Earthwork

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for the following items:
   1. Tanks and turbine enclosures.
   2. Piping and/or transition sumps.
   3. Primary and secondary containment piping.
   4. Flexible connectors and connector jackets when required at vent risers.
   5. Pumps and accessories.
   6. Dispensers and accessories.
   7. Tank accessories.
   8. Manholes.
   9. Automatic overfill prevention system.
   10. Observation wells.
   11. Manufacturer's testing and installation data.

12. Island forms.
13. Installer Certificate of Training from tank manufacturer.
14. Monitoring system and related components.

B. Manufacturer's Certification: Submit Certification of Installation on form included at end of this Section, signed and countersigned by Contractor and Fuel Facility Installer.

1.4 QUALITY ASSURANCE

A. Perform work with installer specializing in underground storage tank installations with a minimum of five years successful experience, approved in underground storage tank installation by tank manufacturer.

B. Schedule a pre-installation conference with all subcontractors; include Installer's on-site Foreman. Coordinate with OWNER'S Project Manager.

C. Licensed or Certified Contractors must be used. Contractors who perform tank work are required to have a certification from the International Fire Code Institute (IFCI). Contractors are required to carry proof of certification on site.

1.5 REFERENCE STANDARDS

A. API 1615 – Installation of Underground Petroleum Storage Systems; current edition.

B. ASTM D 1785 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; current edition. (for monitoring wells where required)

C. ASTM F 480 – Standard Specification for Thermoplastic Well Casing Pipe and Couplings Made in Standard Dimension Rations, Schedule 40 and Schedule 80; current edition.

D. California Air Resources Board (CARB)

E. CFR 40 Part 60 – Standards of Performance for New Stationary Sources; current edition.

F. International Fire Code Institute (IFCI); current edition.

G. NFPA 30 – Flammable and Combustible Liquids Code; current edition.

H. NFPA 30A – Code for Motor Fuel Dispensing Facilities and Repair Garages; current edition

I. Petroleum Equipment Institute (PEI)

1. PEI RP100 – Installation of Underground Liquid Storage Systems; current edition.

2. PEI RP300 – Installation and Testing of Vapor Recovery Systems at Vehicle Fueling Site; current edition.

1.6 WARRANTY

A. Provide warranty in accordance with General Conditions and Section 017000 – Execution and Closeout Requirements.

B. Guarantee tanks against cracking, breakup, and collapse for 30 years from date of installation.

1.7 MAINTENANCE/OPERATION

A. Deliver three copies of calibration chart and one dipstick, calibrated in 1/8 inch increments, for each size of UST to OWNER'S Project Manager.

B. Deliver one plug and one extractor wrench to OWNER'S Project Manager.

1.8 PERMITTING OF TANKS

A. Contractor shall obtain all permits from local environmental jurisdiction, including local and state fire marshal prior to installation of tank as required by local and state code. Fuel design engineer to provide stamped plans as required.

PART 2 - PRODUCTS

2.1 GENERAL:

A. The Contractor will furnish all specified items as listed in the drawings and specifications. Contractor will furnish appurtenant accessories not listed in the drawings and specifications as required to complete the entire installation.

B. The Contractor will install all equipment furnished by Owner identified in the specifications.

C. The Contractor will contact local agency with environmental jurisdiction and Fire Marshal prior to installation of tank as required by local code.

D. All secondary containment systems shall pass a post-installation test, which meets the approval of the local agencies with jurisdiction.

E. Contractor shall certify that the installation of the tanks and piping meets the following conditions below:

1. The installer has been adequately trained as evidenced by a certificate of training issued by the tank and piping manufacturers.
2. The installer has been certified or licensed by the Contractors State License Board.

3. The underground storage tank, any primary piping and any secondary containment, was installed according to applicable voluntary consensus standards and any manufacturer's written installation instructions.
4. All work listed in the manufacturer's installation checklist has been completed.
5. The installation has been inspected and approved by the local and/or state agencies, or, if required by the local agencies, inspected and certified by a registered professional engineer who has education in and experience with underground storage tank system installation.

2.2 ACCEPTABLE MANUFACTURERS

A. Acceptable Tank and Turbine Enclosure Manufacturers: Containment Solutions Inc. or Xerxes Corporation.

B. Acceptable Piping and Transition Sump Manufacturer: S. Bravo System, Inc. or OPW Fueling Components.

C. Acceptable Piping Manufacturers: NOV Fiberglass Systems; Red Thread IIA or Dualoy L/LCX, or Omega Flex, Inc.: DoubleTrac.

D. Acceptable Flexible Connector Manufacturers: Hosemaster, Omega Flex, Inc., Flex-ing by Franklin Fueling Systems, OPW Fueling Components.

E. Acceptable Submersible Pumps and Leak Detector Manufacturers: Red Jacket Pumps (Veeder Root), FE Petro, or Vaporless Manufacturing, Inc. (leak detector only).

F. Acceptable Diesel Dispenser Manufacturers: Gasboy International, Inc. or Wayne Fueling Systems LLC.

G. Acceptable Gasoline Dispenser Manufacturers: Gasboy International, Inc. or Wayne Fueling Systems LLC.

H. Acceptable Dispensing Hose Manufacturers: Continental Contitech USA, IRPCO, or Franklin Fueling Systems

I. Acceptable Nozzle Manufacturers: OPW Fueling Components or Husky Corporation.

J. Acceptable Diesel and Gasoline Filter Manufacturer: Central Illinois Mfg. Co. (Cim-Tek).

K. Acceptable Hose Swivel Manufacturer: OPW Fueling Components.

L. Acceptable Breakaway Coupling Manufacturers: OPW Fueling Components or Franklin Fueling Systems.

M. Acceptable Safety Shut-Off Valve Manufacturers: OPW Fueling Components or Franklin Fueling Systems.

N. Acceptable Dispenser Containment System Manufacturers: S. Bravo System, Inc. (under dispenser containment and new installation entry fittings only), Icon Containment Solutions (for repair entry boots only).

O. Acceptable Hose Retractor Manufacturer: Universal Valve Company, OPW Fueling Components, or Franklin Fueling.

P. Acceptable Island Form Manufacturers: OPW Fueling Components or Riverside Steel Inc.

Q. Acceptable Tank Accessories Manufacturers: OPW Fueling Components, Universal Valve Co. Inc. (observation well cap only), EMCO Wheaton Retail (EVR fill adapter only).

R. Acceptable Manholes Manufacturers: OPW Fueling Components, Franklin Fueling Systems (turbine enclosure manhole only).

S. Acceptable Automatic Overfill Prevention System Manufacturers: OPW Fueling Components or EMCO Wheaton Retail.

T. Monitoring System & Related Components Manufacturer: Veeder-Root.

U. Acceptable Observation Well Manufacturers: Atlantic Screen & MFG, Inc., Environmental Well Products Co., Mono Flex Co. Inc., or National Well Supplies Company Inc. Install only where required by local code.

V. Acceptable Fuel System Control Console: PKM Panel Systems.

W. Acceptable Diesel Exhaust Fluid Storage Manufacturer: Blue1USA (if providing a stand-alone DEF station)

NOTE: Contractor to confirm the requirement of CARB approved EVR equipment with state and local authorities prior to bidding project. OWNER shall request approved equipment in bid documents so equipment installed is compliant.

2.3 UNDERGROUND STORAGE TANKS AND TURBINE ENCLOSURES

A. Fiberglass Tanks and Turbine Enclosures:

1. Tanks: UL listed and labeled; in compliance with applicable requirements of NFPA 30; cylindrical; double wall with watertight turbine enclosure and sump float switch; three 4-inch National Pipe Thread (NPT) fittings located in manway cover, three 4-inch NPT fittings external to manway and two fittings for access to interstitial space between walls of tank; hydrostatic monitoring reservoir with 4-inch NPT fitting, brine solution and reservoir sensor; polyester resin reinforced with glass fibers; circumferential reinforcing ribs; deflector/striker plates under all openings with locations clearly identified on outside of tank.
2. Hold Down Straps: Fiberglass reinforced plastic straps, quantity and location as recommended by tank manufacturer; furnished by tank manufacturer.

3. Manways: 22 inch I.D., UL listed gaskets, bolts, and covers.
4. Turbine Enclosure: Flat-sided collection sump designed to contain submersible pump and collect leaks from double wall product supply piping; mounted to containment collar to allow for access to tank interior; and FRP coupling kit for piping penetrations; friction fit lid, sealed turbine enclosure, (watertight).
5. Sensors: Compatible with Veeder-Root TLS-450Plus UST monitoring system.

2.4 PIPING and TRANSITION SUMPS

A. Piping Sumps (For replacement of turbine enclosures only): octagon shape, with snap-lock lid and vertical o-ring seals to make water-tight. 30-year warranty, slurry pour channel to join two-piece containment sump, fuel compatible resin, corrosion resistant. Collar mount shall be ordered to match the tank manufacturer's collar. Specify height based on site conditions.

1. Single wall fiberglass piping sump Bravo B423-XX-S-01, collar-mounted, or Bravo B483-XX-S-01, tall collar, mounted by tank manufacturer.
2. Double wall fiberglass piping sump Bravo B423-XX-D-01, collar mounted, or Bravo B483-XX-D-01, tall collar, mounted by tank manufacturer
(Double-walled sumps only where required by code).

B. Transition Sumps

1. Flat-sided fiberglass sump, 27-inch riser designed to contain piping and fittings, and to collect leaks from double wall product supply piping
   a. Single-Wall FRP with access at grade:
      1) Planter-style sump Bravo B-501-S-200 for one 2" fitting, B-501-S-220 for two 2" fittings, B-501-S-222 for three 2" fittings, B-503-S-22220 for four 2" fittings or B503-S-22222 for five 2" fittings. Specify number of fittings.
      2) OPW PSTF-4630 or OPW PFTS-4630 (for deep bury), with FRP sump Height Extenders (DFSE-4612) if needed
   b. Double-Wall FRP with access at grade:
      1) Planter-style sump Bravo B-501-D-200 for one 2" fitting, B-501-D-220 for two 2" fittings, B-501-D-222 for three 2" fittings, B-503-D-22220 for four 2" fittings or B503-D-22222 for five 2" fittings. Specify number of fittings.
      (Double-walled sumps only where required by code).
2. Commercial two-piece FRP sump with 10" high 32" diameter riser with Snap-Lock lid, 2" deep pour-in-place channel at top, height adjustable in field or order to fit needs, for underground transitions, typical sizes are:
   a. Single-Wall, flat-sided, two-piece, fiberglass transition sump Bravo B833-S36-01 (3'x3'x3'), B833-S48-01 (4'x4'x4') or B855-S60-01 (5'x5'x5')

b. Double-Wall, flat sided, two-piece, fiberglass transition sump Bravo B833-D36-01 (3'x3'x3'), B833-D48-01 (4'x4'x4') or B855-D60-01 (5'x5'x5') (Double-walled sumps only where required by code).

2.5 TANK ANCHOR MATERIALS

A. Cable Clamps and Thimbles and Turnbuckles: Galvanized steel.

2.6 UNDERGROUND PIPING

A. Primary Pipe: UL listed and labeled for flammable liquid, underground; Fiberglass reinforced with threaded adapters and bonded fittings or 316L corrugated stainless steel mechanically fastened, stainless steel adapters and fittings that fasten to primary and secondary piping.

B. Secondary Containment Pipe: UL listed and labeled for flammable liquid, underground; Fiberglass reinforced outer wall of double wall piping system by primary pipe manufacturer; next size larger pipe from primary pipe; two-piece flanged fittings adhered and bolted or EFEP (Ethylene Fluorinated Ethylene Propylene) permeation resistant barrier with nonmetallic Nylon 12 outer jacket that covers stainless steel primary piping leaving a small interstitial space.

C. Test Reducer: Rigid; part of stainless steel piping connector fitting, entry fitting; fitted with air valve stem; specifically designed to seal off secondary containment piping during testing.

D. Riser Pipe:

1. Four Inch Piping for Fill, Vent/Vapor Recovery, and Automatic Tank Gauge Fittings: Schedule 40, black steel pipe.
2. Four Inch Piping for Monitoring Reservoir: Schedule 40 PVC pipe.
3. Aboveground Vent and Vent Support Piping: Schedule 40 galvanized steel pipe.

2.7 COATINGS

A. Dielectric Coating: Coal tar epoxy, polyurethane or polyester resin or 10-mil thick tape, double wrapped or rubberized spray undercoating.

2.8 FLEXIBLE CONNECTORS

A. Connector: One and one half (1-1/2) or two inches I.D.; UL listed and labeled; one-piece, stainless steel hose, stainless steel wire outer braid; one and one half or two-inch non-re-attachable stainless steel end fittings.

B. Connector Jackets: Rated for compatibility with gasoline and fuels, resistance to permeability of gasoline and fuels, nylon velcro seal, meets UL-224, and includes boot glue and donut seal.

2.9 PUMPS AND ACCESSORIES

A. Pump: UL listed and labeled; submersible; 2 hp, single phase, 60 hertz, 208-230 volt.

B. Leak Detector: UL listed and labeled; automatic line (piping) leak detection by restricting or shutting off the flow of product through piping; product (thermal) contraction compensating, piston type; capable of detecting leaks of 3 gph at 10 psi line pressure within one hour.

2.10 DISPENSERS AND ACCESSORIES

A. Diesel Dispenser: Rain-tight enclosure; dual sided, 1" LCD electronic display; 999999 gallon electronic accumulative totalizer; four-piston CFT meter accurate at any delivery and pressure; electric reset; one inch, dual-stage electric solenoid valve located inside the cabinet and on the discharge side of the meter; internal one inch satellite port; integral junction box for field connections; product inlet must be centered to facilitate easy retrofit; side load nozzle position one inch diameter by five feet long, UL listed hardwall hose section with a one inch breakaway coupling installed approximately one foot from a one inch UL approved automatic nozzle with a hold open clip. Dispenser must be capable of and set at 17 GPM flow rate at the nozzle. UL listed and labeled. Must include pulse output interface option.

1. Gasboy Atlas Series 9853KX or Wayne Select Series 3/G7227D/GJKMR or equivalent

B. Gasoline Dispenser single hose: Rain-tight enclosure; dual sided, 1" LCD electronic display; 999999 gallon electronic accumulative totalizer; four-piston CFT meter accurate at any delivery and pressure, electric reset; one inch, dual-stage electric solenoid valve located inside the cabinet and on the discharge side of the meter; integral junction box for field connections; 10 micron internal spin-on filter; product inlet must be centered to facilitate easy retrofit; side load nozzle position ¾ inch diameter by five feet long, UL listed hardwall hose section with a ¾ inch breakaway coupling installed approximately one foot from a ¾ inch UL approved automatic nozzle with a hold open clip; dispenser must be capable of and set at 10 GPM flow rate at the nozzle; UL listed and labeled. Must include pulse output interface option.

1. Single hose: Gasboy Atlas Series 9853KX or Wayne Select Series 3/G7201D/2GJK or equivalent

C. Nozzles: Aluminum body, automatic shut-off; replaceable spout, with hold open clip, UL listed and labeled.

1. Diesel: 1-3/16 inches o.d., OPW 7HB-0100 or Husky VIIIS 177610-03.
2. Gasoline: 13/16 inch o.d., OPW 11BP-0400 or Husky XS 159559-04.

D. Diesel Filter: Capable of 17-gpm flow; 10-micron, microglass filter; spin-on type.

E. Gasoline Filter: 10-micron, microglass filter; spin-on type.

F. Hose Swivel: 45 degree design; OPW 45-5060 (3/4 inch x 3/4 inch) for unleaded gasoline, OPW 45-5075 (1 inch x 1 inch) for diesel; UL listed and labeled.

G. Breakaway Coupling: Field repairable type; Coupling separation at 200-350 pounds maximum pulling force; integral, flow preventing, seals or valves activated upon coupling separation; UL listed and labeled, retains UL listing after separation and reassembly.
   1. OPW Fueling Components: 66V-0300 for unleaded, 66V-1300 for diesel.
   2. Franklin Fueling Systems: 697-137-01 for unleaded, 797-133-01 for diesel.

H. Safety Shut-Off Valve: Location of shear section of valve per manufacturer's instructions.
   1. OPW Fueling Components: 10 Series
   2. Franklin Fueling Systems 662 series

I. Dispenser Containment System: One piece all fiberglass dispenser sump specifically designed to detect and contain a dispenser leak, and sized for dispenser manufacturer and model; supplied with fittings for secondarily contained product piping, and Leighton O'Brien Dri-Sump Vapor Stimulator Tube (VST), with electrical offset system.
   a. Bravo B1210-S30-VST for Wayne Select Series master diesel dispensers and diesel/gasoline remote dispensers.
   b. Bravo B8220-S30-VST for Wayne Select diesel satellite dispensers.
   c. Brave B1670-S30-VST for all Gasboy Atlas dispensers.
   d. Bravo B9210-S36-VST for all Wayne Select deep burial applications.
   e. Bravo B9670-S36-VST for all Gasboy Atlas deep bury applications
   f. Bravo B8670-D30-VST Double-Walled for Gasboy Atlas dispensers
   g. Bravo B8210-D30-VST Double-Walled for Wayne Select dispensers.
   (Double-walled sumps only where required by code)

J. Island Forms: stainless steel island forms, half-circle radius, straight.
   1. 4'x10' stainless steel island form:
      a. OPW 6013SS-SFHCW4L10,
      b. Riverside island form W4', H13", L10', Radius full
   2. 4'x14' stainless steel island form:
      a. OPW 6013SS-SFHCW4L14
      b. Riverside island form W4', H13", L14', Radius full
   3. 4'x25' stainless steel island form:
      a. OPW 6013SS-SFHCW4L25,
      b. Riverside island form W4', H13", L25', Radius full

M. Hose Retractor: Cast iron head, stainless steel cable installed on 2” schedule 40 steel pipe, height varies, anchored in concrete minimum 18”, no surface mounting.
   1. Universal Valve Company 870-HB100.
   2. Franklin Fueling- HRTRVR

2.11 ACCESSORIES

A. Cap (for fill assembly): Non-EVR: OPW 634TT-4000; corrosion resistant, Duratuff body; buna-n gasket; hole for padlock or EVR: OPW 634TT-7085EVR; corrosion resistant body; four inches; toggle lever type; top seal, buna-n gasket; hole for padlock.

B. Cap (for vent/vapor recovery assembly): OPW 1711T-7085EVR; corrosion resistant body; three inches; toggle lever type; top seal, buna-n gasket; hole for padlock.

C. Cap (for diesel vent piping at island): OPW 23-0033; two inches; aluminum body; 40 mesh brass screen; open type; vapors directed upward; set screw installation to vent riser pipe.

D. Cap (for gasoline vent piping at island): Non-EVR: OPW 623V-2203; two inches; Duratuff body; pressure/vacuum setting – 2.5” – 6” water column pressure settings and -6” - -10” water column vacuum settings are factory preset and tested; set screw installation to vent riser pipe; gasketed. EVR: OPW 723V-2203.

E. Cap (for observation well): Universal 1300-40; Blue PVC casing-injection molded corrosion proof plastic body; Buna-N seal; designed for four inches slotted PVC well pipe in accordance with API-RP-1615; seals water and vapor tight; lockable.

F. Adapter (for vent/vapor recovery assembly): Non-EVR: OPW 1611AV-1605; clear anodized aluminum; poppeted. or EVR: OPW 61VSA-1020-EVR; bronze; swivel.

G. Adapter (for fill assembly): Non-EVR: OPW 633T; corrosion resistant body or EVR: OPW 61SALP-1020-EVR; Bronze; swivel or EMCO Wheaton A0089-001; Aluminum

H. Extractor Fitting (for gasoline vent/vapor recovery assembly): OPW 233-4422; cast iron body with Duragard coating; four inch by two inch by two inch with four inches top and tank connection threads and two inches outlet threads.

I. Extractor Fitting (for diesel vent assembly): OPW 233-4420; cast iron body with Duragard coating; four inch x two inch with four inches top and tank connection threads, and two inches outlet thread.

J. Fiberglass Entry Fittings: Bravo FRP fittings with dual secondary test ports (For new installations only). Test ports shall be located between the 6 and 9 o’clock position. Entry Fittings to be installed perpendicular to the sump walls.

1. F-07-S-0-F: 3/4 inch galvanized conduit penetration into piping/dispenser sump.
2. F-10S-0-F: one inch galvanized conduit penetration into piping/dispenser sump.
3. F-32-T-F: three inch over two inch fiberglass piping penetration into piping/dispenser sump.
4. F-43-T-F: four inch over three inch fiberglass piping penetration into piping/dispenser sump.
5. F-32U-T-F: two inch LCX Coaxial fiberglass piping penetration into piping/dispenser sump.
6. F-43U-T-F: three inch LCX Coaxial fiberglass piping penetration into piping/dispenser sump.
7. F-15-OFLX-CR5: DoubleTrac 1-1/2" Pipe piping penetration into piping/dispenser sump.
8. F-20-OFLX-CR5: DoubleTrac 2" Pipe piping penetration into piping/dispenser sump.
9. F-15-OFLX-D-CR5: DoubleTrac 1-1/2" Pipe piping penetration into double walled piping/dispenser sump.
10. F-20-OFLX-D-CR5: DoubleTrac 2" Pipe piping penetration into double walled piping/dispenser sump.

2.12 MANHOLES

A. Fill and Vent/Vapor Recovery Manhole: double-wall spill container (manhole) with aluminum cover and cast iron body ring; polyethylene bellows and skirt, visual interstitial float gauge, electronic interstitial sensor gauge, and drain valve.
   1. OPW Fuel Components: five gallon EDGE Series 1SC-3112D with sealable cover, interstitial float gauge and drain valve or five gallon EDGE series 1SC-3132D with sealable cover, electronic interstitial sensor gauge and drain valve or 15 gallon EDGE series 1SC-31512D with sealable cover, interstitial float gauge and drain valve or 15 gallon EDGE series 1SC-31532D with sealable cover, electronic interstitial sensor gauge and drain valve and EVR required OPW 61JSK-44CB Jack Screw and OPW FSA-400 face seal adaptor.

B. Automatic Tank Gauge, Monitoring Reservoir and Grounding Rod Manhole: OPW 104A-1800; steel diamond plate cover and steel skirt, cast iron body ring.

C. Turbine Enclosure or Piping Sump Manhole: OPW 39CD-RL10 or Franklin Fueling System 781-433-12; FRC cover; steel skirt with stainless steel 1/2 inch hex bolts; 36 inches inside diameter.

D. Observation Well Manhole: Universal Valve Co. 98MW-1212; cast iron cover and body with steel skirt; white cover marked with black triangle per API specifications for well symbol; "Observation Well" to be stenciled on lid with black lettering.

2.13 AUTOMATIC OVERFILL PREVENTION VALVE

A. CARB–approved OPW 71SO-T; aluminum drop tube (OPW 61FT-3012) with integral vapor tight, testable 2-stage automatic overfill prevention valve designed to close at 95% full or CARB-approved Emco Wheaton A1100; testable 2-stage automatic overfill prevention valve designed to close at 95% full.

2.14 MONITORING SYSTEM

A. System Description: TLS-450Plus fuel UST monitoring system with inventory monitoring, in-tank leak detection and interstitial leak sensing for interstitial spaces of double wall tank and piping sump.

B. System Components:

1. TLS 450Plus Console with integral printer and software (333545-001).
2. Sensor/probe module (332812-003).
3. Input/output interface module (332813-001).
4. Magnetostrictive Plus digital sensing probe appropriate for diameter tank (form number 846390), with probe riser cap and ring kit (312020-952). For EVR sites only use OPW 62M Monitor Probe Cap with FSA-400A under each probe cap.
5. Tank and dispenser sump sensor, non-discriminating (form number 794380-208).
6. Phase-two gasoline probe installation kit (886100-000).
7. Diesel probe installation kit (846400-001).
8. Dual float hydrostatic tank sensor (form number 794380-303).
9. Dispenser sump sensor if underground piping and remote dispensers are existing (non-discriminating, stand-alone, form number 847990-001). ONLY IF REQUIRED.
10. Low Voltage Dispenser Interface Module (LVDIM) (note: only applies for sites requiring BIR on mechanical dispensers, which are still under manufacturer's warranty.)
    a. New TLS-450Plus: (333581-001).

Note: When installing new electronic dispensers with a TLS-450Plus, install data wiring from dispensers and spool in wireway, for future BIR connection.

C. Provide "system start-up" as described in manufacturer's Technical Manual for System Start-Up and Operating Instructions. Include general programing parameters as follows: 1" water warning, 2" water alarm, 90% ullage (instead of 100% ullage), 90% and 95% high product level alarms. Also, password protect console settings access. OWNER'S project manager to provide password.

2.15 OBSERVATION WELLS

A. Slotted Well Screen: ASTM D 1785 or F 480 polyvinyl chloride (PVC); schedule 40; four inches nominal diameter; PVC internal slip plug fastened in place with stainless steel or PVC pop rivets at bottom; internal expansion plug at top; slotted section of well to intercept the water table.

B. Internal expansion plug; lockable cap for observation well (OWNER'S to supply lock) with CH Hanson one inch x three inch stainless steel tag attached with wire. Tag to have "Observation Well" engraved on it.

C. Compliance wells shall be installed within backfill at each corner of UST excavation, within 10 feet of each dispenser sump, within 25 feet of any point of piping run, and within 10 feet of any piping bend or change of direction.

D. The well screen shall extend at least two feet above the static groundwater table, five feet below the annual low water level, one foot below the bottom of the tank, and no less than two feet below the ground surface.

2.16 BEDDING AND BACKFILL MATERIAL

A. Pea Gravel: As specified in Section 313000 – Earthwork.

B. Stone Crushing's: As specified in Section 313000 – Earthwork.

2.17 FUEL POWER CONTROL SYSTEM

A. The Contractor is responsible for mounting and wiring a pre-manufactured fuel power control unit by PKM Panel System (732-238-6760). The Saginaw NEMA 4 ANSI 61 gray fuel control enclosure houses the following components:

1. 2-pole circuit breaker(s) for fuel control unit and pump(s) – Square D 860-MG17444
2. Control relay(s) with 4 DPT contacts 6A, 110-120VAC coil - IDEC RU4S-C-A110
3. Time delay relay(s) with delay range from 1 second to 10 hours, 120VAC DPDT - ATC 339B-200-Q2X
4. Surge suppressor inline 120 V AC 2.5 amp – ASCO 1C + 102
5. Full voltage motor starter NEMA size 0, non-reversing 18A 2HP 2-pole, 120V AC, 60Hz. Coil – Square D 8536-SB01V02S
6. Lighting contactor 2-pole 30A 120V AC, 60Hz. Coil – Square D 8903L020V02
7. Terminal block 600V, 32A – Weidmuller WDU4
8. Ground Bar - PKM
9. Non-illuminated emergency stop push button, NEMA 4/13 30mm, Red 1 NC – AB 800T-FXT6D4

10. Green pilot light – Standard, NEMA 4/13 30.5mm, 120VAC XFMR, Plastic lens – AB 800T-P16G
11. Illuminated push button, momentary, NEMA 13, 30.5mm Extended, Red 1 NC, 120 AC XFMR – AB 800T-PB16RD2X
12. Selector switch, 2-position, maintained, 30 mm, black knob, white insert, 1 normally open, contact block, NEMA 4/13 AB 800T-H2D1
13. Offload pump E-stop contactor – Telemecanique LC1D12G7

B. After fuel power control enclosure is mounted wire per PKM-provided wiring schematic and test system components to verify proper wiring.

2.18 DIESEL EXHAUST FLUID (DEF) STORAGE

A. Storage of DEF shall be in an insulated control building with heat with hinged roof with pneumatic lifts, HDPE primary tank with manway, built in dispenser with 15' hose and retractable reel with magnetic nozzle, swivel-breakaway with spare magnetic collar, overfill protection, stainless steel fill-port with 2" dry-break coupler, atmospheric vent with protective screen, stainless steel piping, 1/2 HP submersible DEF pump, leak-proof fittings, audible alarm, conforms to ISO 22241-3,4 standards and has pre-wired electrical components per NEC, NFPA 70 that meet UL-508A and CSA C22.2 standards, 30 amp service required, single phase, 110V, 60 Hz, 1.1kW.

B. The installation of a DEF storage unit shall be determined by OWNER'S Project Manager, and shall be sized according to the diesel throughput of the facility:
   1. Blue1USA COM500 - 500 gallon commercial Mini-Bulk (44"x107"x88.5"H)

C. Unit shall be installed in non-hazardous area, outside of Class 1, Div. 2 zone.

D. Unit shall be installed on existing pavement or island with no underground piping.

PART 3 - EXECUTION

3.1 HANDLING OF UNDERGROUND STORAGE TANKS (UST):

A. The Contractor is responsible for off-loading the tank(s) from the delivery vehicle. A crane or backhoe of sufficient lifting capacity must be used. Actual weights shall be verified with manufacturer prior to submitting a bid.

B. Lifting and Moving: When lifting or moving a UST always use properly sized equipment and lift by lifting lug(s). On large tanks, greater than eight feet in diameter, identify lifting lug orientation and use appropriate method to lift the tank. When lifting with multiple lifting lugs ensure the lifting angle is no more than 60 degrees between lifting lugs. Never roll or use cables or chains around tank. Set on smooth ground, free of rocks and foreign objects in staging area.

C. Exception: Tank can be rolled up to 90 degrees on smooth clean surface when performing the "pre-installation" pressure test.

D. Chocking: Tanks are to be chocked in accordance with manufacturer's recommendation until ready for installation. If windy conditions exist or are expected, anchor tanks using minimum 1/2 inch nylon or hemp rope over each tank and secure to stakes of adequate size to prevent movement of the tanks.

E. Openings: All tanks are shipped with dust covers in each opening. Dust covers are to remain in each opening until ready for the pre-installation pressure test. All tanks must have either a dust cap in place or a five psi pressure relief valve in place at all times.

F. Damage:

1. Inspect all tanks carefully for signs of damage upon receipt and prior to off-loading from the delivery truck. Note any damage on the shipping documents and notify the Owner's Project Manager. Contact the tank manufacturer for additional information.
2. If tank is damaged, do not attempt repairs or off-loading. Owner's Project Manager is to be notified and will determine the course of action that will be followed.
3. Contractor is responsible for verifying that vacuum gauge on secondary tank wall maintains a constant reading. Do not attempt repairs or off-loading.

3.2 INSTALLATION QUALITY CONTROL:

A. Take internal diameter measurements at the fill and remote pump openings on tanks. The Contractor, witnessed by the Owner's inspector, is responsible for making and recording these measurements on a form provided by the Contractor. Take the first set of measurements prior to placing any backfill around the tank. The second set of measurements is to be taken when the backfill has reached subgrade (prior to pouring the concrete slab).

B. The Contractor is to stop work if the difference between any two sets of readings is greater than 3/4 inch, or as listed from the manufacturer's maximum allowable deflection. Notify the Owner's inspector, who will determine the course of action. Contact the tank manufacturer for further guidance.

C. Pre-Installation Testing: All tanks must be tested for leaks prior to installation. Use the visual air/soap test.

D. Visual Air/Soap Test:

1. Warm weather soap solution - five gallons of water with eight ounces of household dishwashing detergent.
2. Freezing conditions soap solution - substitute one gallon of automotive windshield washer solution for one gallon of water.
3. Cover all fittings with soap solution.
4. Carefully inspect for leaks as indicated by bubbles.

3.3 OUTER WALL TEST FOR HYDROSTATICALLY MONITORED DOUBLE WALL TANKS:

A. Remove the four-inch plug from the reservoir fitting. Inspect for monitoring tracing fluid. If reservoir is empty, call tank manufacturer immediately.

B. Closely inspect outer wall for any trace of colored monitoring tracer fluid. If leak is found, cease installation and alert OWNER'S Project Manager. Contact tank manufacturer immediately to schedule a repair.

C. Tighten all fitting plugs to the annular space and reservoir to avoid spilling monitoring fluid.

D. Inspect tank bottom by lifting tank. After inspection of tank bottom, replace tank on bumper pads.

E. Connect air compressor line to primary tank fitting. Use a pressure relief valve set to five psi. Pressurize tank to five psi maximum per manufacturer's installation instructions. Monitor pressure for 30 minutes for CSI tanks or one hour for Xerxes tanks. Any loss in pressure from initial reading may indicate a leak.

F. Apply a soapy water solution to all fittings and manways. Check for leaks as indicated by bubbles. If bubbles are present, tighten the plugs or bolts and retest.

3.4 INNER WALL TEST FOR HYDROSTATICALLY MONITORED DOUBLE WALL TANKS

A. Release pressure from primary tank.

B. Remove primary tank fitting plug.

C. Look inside for any accumulation of monitoring tracer fluid. If a colored fluid is found, call tank manufacturer immediately.

D. Replace and tighten fitting plug.

E. Loosen plug to vent annular space.

3.5 INSTALLATION

A. Perform excavation, filter fabric placement, trenching, backfilling and compaction in accordance with Division 31. Notify OWNER'S Project Manager in advance of when backfilling is to take place.

B. Fabricate deadmen (or hold down slab) in accordance with tank manufacturers installation instructions.

C. Pump water out of the tank pit if required. Keep water out of the tank pit until tanks have been set, tied down, ballasted, and backfilled.

D. Set tanks on prepared bed with tanks level.

E. Install tanks, turbine enclosures, piping sumps, piping, flexible connectors, and connector jackets, pumps, dispensers, accessories, manholes, automatic overfill prevention system, monitoring system, and observation wells in accordance with manufacturer's installation instructions and the recommendations of PEI RP100.

F. Lay deadmen along each side of tank, parallel to tank.

G. Position tank manufacturer supplied anchor straps per manufacturer's installation instructions.

H. Fasten galvanized turnbuckles through deadman anchor and through the end point of the hold down strap.

I. Make sure each deadman section has at least two anchor points. The tank must not overshadow the deadman anchor.

J. Connect all straps with turnbuckles then tighten uniformly with other straps. Straps should be snug but cause no tank deflections.

K. Coat or wrap all exposed metallic hold down anchors, turnbuckles, and accessories with dielectric coating having a minimum dry film thickness of 10 mils, prior to backfilling.

L. Ballast tanks with water to at least 1/2 full immediately after completion of backfilling (Protect water from freezing).

1. Only the primary (inner) tank shall be used when ballasting the tank. The tank may be ballasted after the backfill is even with the top of the tank and post-installation testing has been successfully completed. Only under wet-hole conditions, as described in the installation manual, should ballast be added before the backfill is even with the top of the tank. When filling the tank, make sure the tank is properly vented. The vent must be large enough to allow the displaced air to escape.
2. Provide materials and labor to ballast underground storage tanks with water, as required. Follow underground storage tank manufacturer's installation instructions for proper ballast procedure. Do not ballast underground storage tanks with product.
3. OWNER will not provide fuel as ballast.
4. Contractor is responsible for complete removal and disposal of ballast from tanks.

M. Do not install submersible pumps until all water is removed from the tanks.

N. Venting: Vent the primary tank as shown on the drawings and as required to conform to all Federal, State, and Local regulations.

O. Interstitial Monitor: An electronic hydrostatic sensor shall be provided to monitor the interstitial wet space as specified in the equipment list section of this specification.

P. Installing the Turbine Enclosure and Piping Sump:

1. The Turbine Enclosure and Piping Sump must be watertight to prevent liquid ingress or egress. Sand and clean all joint areas and apply adhesive to tank collar and turbine containment sump. Install as shown on plans.
2. Securely plug all unused tank openings with screw type galvanized steel plugs. Unused openings outside the Turbine Enclosure and Piping Sump must have a fiberglass hat cap epoxy glued over the plug to provide a secondary type containment and seal.
3. Cut all openings through the Turbine Enclosure and Piping Sump and install fiberglass entry boot type fittings for all lines (product and electrical conduit). All entry fittings to be installed perpendicular to the Turbine Enclosure and Piping Sump walls.
4. Liquid sensing probes shall be installed in each sump where fuel may be present.
5. Double wall piping must have drainage openings that drain into the sump area and test ports to verify piping integrity.

Q. Hydrostatic Water Test: Test joint seal between the collar and turbine enclosure and all field mounted fittings by filling sump with water above all penetration fittings. Mark level in sump with grease pencil and inspect outside of sump for leaks at penetration fittings and collar glue joint. Maintain water in sump for 24 hours.

R. Installing the Spill Container: The spill container at the fill and vent/vapor recovery must be liquid tight. Test all spill containers by filling with water for a minimum of one hour. There should not be a drop in the water level during this test. Do not drain water into the tank. Paint all fill lids per the American Petroleum Institute (API) standard fill port color codes and symbols.

S. Installing the Dispenser Containment System: The dispenser containment system must be liquid tight. After completion of both the primary piping and secondary containment piping and prior to backfilling the piping, test all dispenser containment systems by filling with water for a minimum of one hour. There should not be a drop in the water level during the test.

T. Install fiberglass pipe for underground piping, except install black steel pipe for four inch riser piping from tank(s), four inch schedule 40 PVC for monitoring reservoir riser(s). Coat exposed steel pipe with dielectric coating.
1. Install fiberglass secondary containment pipe for product supply piping, so product releases from primary pipe will drain to piping sump.
2. Slope underground piping minimum 1/8 inch per foot down to tank or piping sump, as applicable.
3. Install test boot(s), tee(s), and/or elbow(s), and riser pipe in dispenser sump.
4. Install Flexible Connectors:
    a. In product piping for connection to submersible pump, and at dispenser containment box.

5. Place a minimum of six inches backfill material around piping.

U. Install galvanized steel pipe for aboveground vent riser and vent support piping. Install the flexible connector and connector jacket prior to changing from FRP pipe to the galvanized steel pipe.

V. When directed by the OWNER'S Project Manager remove water from the tank(s) so that no more than 1/2 inch remains on the bottom. The OWNER'S Project Manager will arrange and pay for product to fill tank(s).

W. Install submersible pumps after product has been added to tank. Do not operate submersible pumps without leak detectors installed and operating.

X. Route electrical conduit away from piping. Ensure minimum six inches clearance between conduit and piping.

Y. Identify probe and sensor locations at monitoring system console. Tag probes and sensors with numbers corresponding to those on console.

Z. Install fuel dispensing systems free of leaks.

3.6 FIELD QUALITY CONTROL

A. Contractor Furnished Testing:

1. Prior to tank installation, tighten all fittings and pneumatically test to five psi pressure in accordance with manufacturer's installation instructions.
2. Measure, record, and compare the interior vertical tank diameter before backfilling and after backfill is brought up to subgrade to verify the tank backfill support.
    a. Re-certify and re-install tanks with vertical deflections in excess of maximum allowable deflections published by tank manufacturer, at no cost to Owner.
3. After backfilling, and 24 hours after ballasting tanks with water, perform a hydrostatic monitor precision tank test in accordance with the tank manufacturer's hydrostatic testing instructions; record liquid levels. Hydrostatically monitor the tank daily until after the paving has been placed.
4. After completion of primary piping and prior to completion of secondary containment piping on the product supply piping, test primary piping to 50 psi in accordance with manufacturer's installation instructions. Notify the OWNER'S Project Manager in advance of when such test is to take place.
    a. After testing, reduce pressure to 25 psi and monitor piping daily until after the paving is placed, to ensure 25 psi pressure is maintained.
5. After completion of both primary and secondary containment piping and prior to backfilling the piping, test the secondary containment piping to 10 psi in accordance with the manufacturer's installation instructions. Notify the OWNER'S Project Manager in advance of when such test is to take place.

a. After testing, reduce pressure to 5 psi and monitor piping daily until after the paving is placed to ensure 5 psi pressure is maintained.

b. After paving has been placed, move test reducer in piping sump to an open position.

6. . Perform any other tests required by the local regulatory authority.

B. Owner Furnished Testing:

1. After paving has been placed over underground fuel storage tanks, piping and connectors, and water has been removed from the tank, the Owner will engage a precision tank and line tester to test for leaks.

FUEL FACILITY
CERTIFICATION OF INSTALLATION

Fuel Facility Installer (FFI) and General Contractor (GC) shall complete this certification by checking and initialing beside true statements and items completed. Explain statements or items not checked and initialed in the space provided. Identify explanations with corresponding numbers. Use back side if additional space needed. Sign and date the completed certification.

Check:			Initial: FFI	GC
1.	☐	Fuel Facility installed in accordance with PEI RP100 – Recommended Practices for Installation of Underground Liquid Storage Systems.	____	____
2.	☐	Fuel Facility installed in accordance with Contract Documents.	____	____
3.	☐	Installer has been certified by the tank manufacturer and documentation of certification is attached.	____	____
4.	☐	Installer has been certified by the piping manufacturer and documentation of certification is attached.	____	____
5.	☐	Installer has been certified or licensed by the applicable State UST Program Office or other state authority and documentation of certification or licensing is attached.	____	____
6.	☐	Fuel Facility installed in accordance with product manufacturer's installation instructions.	____	____
7.	☐	All work listed in tank manufacturer's installation checklist has been completed, checklist has been filled-out, and copy of checklist is attached.	____	____
8.	☐	All work listed in piping manufacturer's installation checklist has been completed, checklist has been filled-out, and copy of checklist is attached.	____	____
9.	☐	Reinforced concrete, deadman anchor, hold-down slab installed, and tank anchored with fiberglass anchor straps. Steel turnbuckles, cable clamps, and other anchoring accessories coated with dielectric coating.	____	____
10.	☐	Excavation sides and bottom lined with filter fabric.	____	____
11.	☐	Observation wells installed with bottom of pipes two feet below bottom of tank.	____	____
12.	☐	Tank installed level.	____	____
13.	☐	Four inch steel riser pipes coated with dielectric coating.	____	____

Check:		Initial: FFI	GC
14. ☐	Piping sump connected to tank manway with steel interface ring, allowing future tank entry.	____	____
15. ☐	Compressible foam board installed on top of piping sump.	____	____
16. ☐	Extractor fitting installed.	____	____
17. ☐	Overfill prevention valve installed in product fill pipe, set to shut off flow into the tank when tank is 95% full.	____	____
18. ☐	Spill container installed on product fill and vapor recovery riser.	____	____
19. ☐	Dispenser containment system installed under each dispenser.	____	____
20. ☐	Safety shut-off valve installed under dispenser, with the location of the shear section of valve installed per manufacturer's instructions.	____	____
21. ☐	Underground piping sloped minimum 1/8 inch per foot down to tank or piping sump, as applicable.	____	____
22. ☐	Flexible connectors installed in product piping for connection to submersible pump, and at the dispenser containment box.	____	____
23. ☐	Flexible connectors installed in vent piping at the vent riser, and in vapor recovery piping at extractor fitting and dispenser containment system.	____	____
24. ☐	Connector jackets installed on underground flexible connectors.	____	____
		____	____
25. ☐	Top of manhole grades set for drainage away from covers.	____	____
26. ☐	Submersible pump installed with automatic line leak detector.	____	____
27. ☐	Dispensers installed with the proper hose length, breakaway coupling, hose swivel, and automatic nozzle with a hold-open device.	____	____
28. ☐	Proper filters installed on each diesel dispenser.	____	____
29. ☐	Fuel Facility installed free of leaks and verified with precision test.	____	____
30. ☐	Monitoring system installed and functioning, including:	____	____
	☐ Piping sump sensor.	____	____
	☐ Test ports in rigid entry boots are located between the 6 and 9 o'clock position.	____	____
	☐ Hydrostatic tank monitor.	____	____
	☐ In-tank probe.	____	____

Check:		Initial: FFI	GC
☐	Console and printer.	___	___
31. ☐	Dispenser timer relay installed in PKM console and verified to stop flow of product after dispenser for: 3 minutes (for gas) 5 minutes (for diesel) 8 minutes (for off-road diesel).	___	___
32. ☐	Leak detection shutdown relay installed in PKM interrupts power to pump if sump or interstitial sensors detect product or monitoring console loses power.	___	___

IN WITNESS WHEREOF,

We set our hands this _____ day of _____, 20____.

By: _____

Title: _____
For Fuel Facility Installer

By: _____

Title: _____
For General Contractor

END OF SECTION

SECTION IV
QUALIFICATION FORM

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

IV
QUALIFICATION FORM
FOUR RIVERS SANITATION AUTHORITY
REQUEST FOR PROPOSALS 24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

Failure to complete this form will result in disqualification of Vendor's bid or proposal.

Each respondent proposing to perform UST REMOVAL AND REPLACEMENT must complete the following information. If the Authority believes a respondent's information is unsatisfactory, the Authority may reject their proposal without further consideration. The Authority's decision in such an event is final, and the Authority's procurement procedures include no method of appeal.

1. Company Name & Ownership

How long has the proposer been in business under the current company name and primary ownership?
# of years: _____

2. Years of Experience

The Authority requires proposers to have a minimum of five (5) years' experience performing UST REMOVAL AND REPLACEMENT.

# of years of experience: _____

Please describe your experience:_____

_____

_____

_____

_____

3. References

Provide the following information regarding three (3) customers for which the respondent has provided a similar type of construction. Please be sure to provide current contact information.[1]

[1] References provided may be contacted by the Authority to be used in evaluation.

Reference #1	
Organization Name	
Street Address	
City, State, Zip	
Dates of Service	From: To:
Contact Person	
Phone	
Email	

Reference #2	
Organization Name	
Street Address	
City, State, Zip	
Dates of Service	From: To:
Contact Person	
Phone	
Email	

Reference #3	
Organization Name	
Street Address	
City, State, Zip	
Dates of Service	From: To:
Contact Person	
Phone	
Email	

4. **Subcontractor List**

Provide a list of subcontractors who will perform work under this contract. Cite the work to be performed by the subcontractor.

Note: Work for which a subcontractor is not listed will be performed by the contractor.

Organization Name	Work to be Performed

SECTION V
PROPOSAL FORM

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

V

PROPOSAL FORM
FOUR RIVERS SANITATION AUTHORITY
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

To: BOARD OF TRUSTEES
FOUR RIVERS
SANITATION AUTHORITY
3501 Kishwaukee St.
Rockford, IL 61109

From: _____
(Individual, Partnership or Corporation)

_____
(Address of Individual, Partnership or Corporation)

Trustees:

I (We) the undersigned hereby propose to furnish UST REMOVAL AND REPLACEMENT in compliance with the attached Notice, General Specifications, Detailed Specifications, Proposal Form, Fair Employment Practices Affidavit of Compliance Form, Forms of Affidavit, and Contract Form.

The Undersigned also affirms and declares:

A. That they have examined and are familiar with all the related contract documents and found that they are accurate and complete and are approved by the undersigned.

B. That they have carefully examined the scope of the required service, and that, from their own investigation, have satisfied themselves as to the nature and location of the delivery point, the character, quality and quantity of materials, and the kind and extent of equipment and other facilities needed for the performance of the service and provision of the materials, the general and local conditions and all difficulties to be encountered, and all other items which may, in any way, affect the materials or services or their performance.

C. That this proposal is made without any understanding, agreement or connection with any other person, partnership, or corporation making a proposal for the same purposes, and is in all respects fair and without collusion or fraud; and that they are not barred from proposing as a result of a bid-rigging or bid-rotating conviction.

D. All goods and services provided in response to this request will be produced in compliance with all applicable requirements of the Fair Labor Standards Act, as amended, and of regulations and orders of the United States Department of Labor.

E. The firm which I (we) represent complies with all applicable requirements of the Americans with Disabilities Act (ADA), the Occupational Safety and Health Act (OSHA), rules and regulations of the US Department of Transportation (DOT), and the Federal Drug Free Work-Place Act. If said firm is awarded a contract to provide the Authority's **UST REMOVAL AND REPLACEMENT** it will:

1. complete all OSHA, ADA, and DOT required supervisory, employee and customer training,
2. document compliance as required,
3. ensure that persons in safety-sensitive positions associated with loading, transportation, and delivery of the merchandise or service detailed in these specifications are subject to all required drug and alcohol testing and are properly licensed,
4. prepare and make available all required information and documentation, and
5. hold harmless and indemnify the Authority and the Authority's representatives as defined in Section 3.12 from all:
    a. Suits, claims, or actions;
    b. Costs, either for defense (including but not limited to reasonable attorney's fees and expert witness fees) or for settlements, and;
    c. Damages of any kind (including but not limited to fines, actual, punitive, and compensatory damages) relating in any way to or arising out of the ADA or the OSHA, to which said firm is exposed or which it incurs in the execution of the contract.

F. The firm which I (we) represent has adopted and promulgated written sexual harassment policies that include, at a minimum, the following information:

1. the illegality of sexual harassment;
2. the definition of sexual harassment under Illinois State law;
3. a description of sexual harassment, utilizing examples;
4. my (our) organization's internal complaint process including penalties;
5. the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Illinois Human Rights Commission;
6. directions on how to contact the Department and the Commission; and
7. protection against retaliation as provided by Section 6-101 of Illinois Human Rights Act. (775 ILCS 5)

Upon request, my (our) organization will provide the Illinois Department of Human Rights with the information described in F1 through F7 above.

In submitting this proposal, I (we) understand that the Authority may reject part or all of any and all proposals. I (we) agree that I (we) must not withdraw this proposal for a period of sixty (60) calendar-days following the scheduled proposal due date. I (we) have carefully examined the nature of the service and materials. The cost of all the materials, equipment, and service necessary to complete this contract is given in this proposal.

The selected proposer must enter into a Contract with the Authority to complete the Project in a form substantially similar to the Contract attached hereto. The Contract must be

executed by the Contractor/Vendor and returned, together with the Insurance Documents and Performance Bond (if applicable) within ten (10) calendar days after it has been mailed to the Contractor. Two copies of the contract must be executed by the Contractor. One fully executed copy will be returned to the Contractor. See Section IX for a sample copy of the agreement.

PROPOSAL PRICES FOR UST REMOVAL AND REPLACEMENT
AS SPECIFIED IN THIS REQUEST FOR PROPOSALS #24-401

Failure to complete this form will result in disqualification of Vendor's proposal.

COST OF WORK:

The undersigned, acting for and on behalf of contractor and having familiarized himself with conditions affecting the cost of the work and its performance and having carefully examinedand fully understood the entire request for proposals package, hereby affirms and agrees to enter into a contract with the Authority.

To provide all supervision, labor, material, equipment and all other expense items to completely perform the work covered by all specifications for the work.

The undersigned submits herewith his bid for the indicated item as follows:

FIXED PRICES

1) Tank Removal - Complete the removal of the existing (3) underground storage tanks and related equipment.

Lump Sum Total $_____

2) New Fuel Island - Complete the installation of a single 22,000 gallon underground (3) compartment fuel tank, a 500 gallon aboveground Diesel Exhaust Fluid (DEF) tank, a 9'x16' control building, a canopy and associated equipment.

Lump Sum Total $_____

UNIT PRICES

3) Additional cost to remove and dispose of petroleum contaminated soil materials encountered during the excavation.

$_____per ton

4) Additional cost for the complete removal and disposal of contaminated soil encountered during excavation per ton as directed by the Owner's Project Manager.

$_____per ton

5) Additional cost for the complete import and placement of soil backfill per ton to replace contaminated soil removed off-site as directed by the Owner's Project Manager.

$____per ton

6) Additional cost for the vacuuming and disposal of sludge and tank rinse effluent collected during tank cleaning, and vacuuming and disposal of free product or contaminated water encountered during excavation, per gallon as directed by the Owner's Project Manager.

$____per gallon

7) Additional cost for the replacement of self-compacting rock to top of water level in tank excavation as directed by Owner's Project Manager in the situations where high ground water exists, as directed by the Owner's Project Manager.

$____per ton

*All quotations must be the total amount of the proposer's charge, inclusive of labor, and of materials, supplies, tools, permits and any and all other expenses necessary to provide UST REMOVAL AND REPLACEMENT in complete conformity with any and all provisions of this document.

TIME OF COMPLETION:

By signing this proposal, I/we, the proposers, agree to the terms of the proposal, proposal requirements, addenda, and contract.

DATE: _____

PROPOSER: _____ BY: _____
print name of firm authorized rep's signature

_____ _____
print street address print rep's name

_____ _____
print city, state, zip print rep's title

_____ _____
area code and phone number email address

Note: The Four Rivers Sanitation Authority, a Governmental Unit, pays neither Federal Excise Tax nor Illinois Retailers' Occupational Tax. The proposer must exclude those taxes from their proposal.

"NO PROPOSAL" RESPONSE

TO

REQUEST FOR PROPOSALS

If your firm is unable to submit a proposal at this time, please provide the information requested in the space provided below and return to:

Four Rivers Sanitation Authority
3501 Kishwaukee Street
Rockford, IL 61109

For this form only, responses can also be emailed to:

purchasing@fourrivers.illinois.gov

We have received Request for Proposals **#24-401: UST REMOVAL AND REPLACEMENT**, due at 2**:00 P.M**. on **April 12, 2024**.

Reason for not submitting proposal:

_____

_____

_____

_____

BY: _____
Signature

_____
Name & Title, Typed or Printed

_____
Company Name

SECTION VI
FAIR EMPLOYMENT PRACTICES AFFIDAVIT OF COMPLIANCE

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

VI

FAIR EMPLOYMENT PRACTICES AFFIDAVIT OF COMPLIANCE
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT
Failure to complete this form will result in disqualification of Vendor's bid or proposal.

PROJECT: UNDERGROUND STORAGE TANK (UST) REMOVAL AND REPLACEMENT

NOTE: THE PROPOSER MUST EXECUTE THIS AFFIDAVIT AND SUBMIT IT WITH ITS SIGNED PROPOSAL. THE FOUR RIVERS SANITATION AUTHORITY CANNOT ACCEPT ANY PROPOSAL WHICH DOES NOT CONTAIN THIS AFFIDAVIT

_____, being first duly sworn, deposes and says that:
(Name of person making affidavit)

They are: _____ of _____
(Officer's Title) (Company Name)

that said company is and "Equal Opportunity Employer" as defined by Section 2000(e) of Chapter 21, Title 42 of the United States Code annotated and Federal Executive Orders #11375 which are incorporated herein by reference;

and that said company will comply with any and all requirements of Title 44 Admin. Code 750. APPENDIX A – Equal Employment Opportunity Clause, Rules and Regulations, Illinois Department of Human Rights, which read as follows:

In the event of the contractor's non-compliance with the provisions of this Equal Employment Opportunity Clause or the Act, the contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be cancelled or voided in whole or in part, and other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance of this contract, the contractor agrees as follows:

1) That he or she will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status or an unfavorable discharge from military service; and, further, that he or she will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any underutilization.

2) That, if he or she hires additional employees in order to perform this contract or any portion of this contract, he or she will determine the availability (in accordance with this Part) of minorities and women in the areas from which he or she may reasonably recruit and he or she will hire for each job classification for which employees are hired in a way that minorities and women are not underutilized.

3) That, in all solicitations or advertisements for employees placed by him or her or on his or her behalf, he or she will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, sexual orientation, marital status, order of protection status, national origin or ancestry, citizenship status, age, physical or mental disability unrelated to ability, military status or an unfavorable discharge from military service.

4) That he or she will send to each labor organization or representative of workers with which he or she has or is bound by a collective bargaining or other agreement or understanding, a notice advising the labor organization or representative of the contractor's obligations under the Act and this Part. If any labor organization or representative fails or refuses to cooperate with the contractor in his or her efforts to comply with the Act and this Part, the contractor will promptly notify the Department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations under the contract.

5) That he or she will submit reports as required by this Part, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Act and this Part.

6) That he or she will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Act and the Department's Rules and Regulations.

7) That he or she will include verbatim or by reference the provisions of this clause in every subcontract awarded under which any portion of the contract obligations are undertaken or assumed, so that the provisions will be binding upon the subcontractor. In the same manner as with other provisions of this contract, the contractor will be liable for compliance with applicable provisions of this clause by subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply with the provisions. In addition, the contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations. (Source: Amended at 35 Ill. Reg. 3695, effective February 18, 2011)

IL Dept of Human Rights Registration No.: _____ Expiration Date: _____

_____
Signature

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

_____
Notary Public

SECTION VII
FORMS OF AFFIDAVIT

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

VII
FORMS OF AFFIDAVIT
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

Failure to complete this form will result in disqualification of Vendor's bid or proposal.

Vendor City: ________________Vendor County: _____________Vendor State: _____________

This Section for Sole Proprietorship:

I, __________________________________ (name), being duly sworn, depose and say that the organization I represent is a sole proprietorship, and that I am the person described in and who executed the foregoing proposal and that the several matters therein stated are in all respects true.

Signature _______________________________________

This Section for Partnership:

I, _________________________ (name), being duly sworn, depose and say that I am a member of ______________________________________ (partnership name), the firm described in and which executed the foregoing proposal; that I duly subscribed the name of the firm thereunto on behalf of the firm; and that the several matters therein stated are in all respects true.

Signature ______________________________________

This Section for Corporation:

We, ______________________________ (representative who signed the Proposal Form), and ____________________________ (other corporate officer), being duly sworn, depose and say that we reside in the cities of _______________________ and ________________________, respectively, and that we are the _______________________ (representative's title) and the __________________________ (other corporate officer's title), respectively, of _____________ __________________________ (corporation name), the firm described in and which executed the foregoing instrument; that we are authorized to complete this form and to enter into this contract on behalf of said corporation; that we have signed our names thereto by like order; and that we have knowledge of the several matters therein stated and they are in all respects true.

__________________________________ __________________________________
(representative's signature) (other corporate officer's signature)

This Section for a Limited Liability Corporation:

I, __________________________ (name), being duly sworn, depose and say that I am a ___________________ (representative's title) of ______________________________________ (company name), the company described in and which executed the foregoing proposal; that I am authorized to complete this form and to enter into this contract on behalf of said company and have knowledge of the several matters therein stated and they are in all respects true.

Signature ______________________________________

Notarization (required for all successful proposers):

Subscribed and sworn to before me this _______ day of _____________________, 20___.

Notary Public ____

County ____

My Commission Expires _______________________________

SECTION VIII
BID BOND

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

BID BOND
FOUR RIVERS SANITATION AUTHORITY
ROCKFORD, ILLINOIS

UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

KNOW ALL MEN BY THESE PRESENT, that we:

_____ (hereinafter called the Principal) and

_____ (hereinafter called the Surety) a

Corporation chartered and existing under the laws of the State of _____

with its principal offices in the City of _____ and authorized to do business in the State of Illinois are held and firmly bound onto the Four Rivers Sanitation Authority of Winnebago County, Illinois (Authority), in the full and just sum of:

_____ Dollars

($_____) good lawful money of the United States of America, to be paid upon demand of the Authority, to which payment will and truly to be made we bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally and firmly by these presents.

WHEREAS, the Principal is about to submit, or has submitted to the Authority, a bid for providing UST REMOVAL AND REPLACEMENT.

WHEREAS, the Principal desires to file this bond, in accordance with law, in lieu of a certified bidder's check otherwise required to accompany this Bid.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this ___ day of _____, 20___.

_____

Principal

(Seal) By _____

Name: _____

Title: _____

Date: _____

ATTEST:

_____

_____

Surety

(Seal) By _____

Name: _____

Title: _____

Date: _____

IX
CONTRACT SAMPLE

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

IX
CONTRACT
FOUR RIVERS SANITATION AUTHORITY
ROCKFORD, ILLINOIS

THIS CONTRACT, made and concluded this ___ day of _____, 20___ between the Four Rivers Sanitation Authority, Rockford, Illinois, also known as "Authority," and _____, their executors, administrators, successors or assigns, known as "Contractor":

In consideration of the payments and contracts mentioned in the Proposal attached hereto, to be made and performed by the Authority, the Contractor agrees with the Authority at their own proper cost and expense to do all the work, furnish all equipment, materials and all labor necessary to complete the work and furnish the merchandise in accordance with the specifications hereinafter described, and the Authority's requirements.

1. Scope

Both parties understand and agree that the Notice, General Specifications, Detailed Specifications, Proposal Form, Fair Employment Practices Affidavit of Compliance Form, and Forms of Affidavit of the **Request for Proposal: UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT**, all Addenda there to (if any), and any and all provisions required by law, are all essential documents of the contract, and are a part hereof, as if herein set out verbatim or as if attached, except for titles, subtitles, headings, table of contents and portions specifically excluded.

The Contractor understands and agrees that unless the contractor and the Authority terminate the Contract by their mutual written contract in conformity with Section 2.12 of this Request for Proposals, the Contractor must provide UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT.

2. Contract Price

The Authority to pay to the Contractor, and the Contractor to accept, in full payment for the performance of this Contract, subject to any additions or deductions provided for hereby, in current funds, the total contract price of:

The Contractor fully understands and agrees that their proposal price will be the only basis for payment for the contract's duration, and that in the absence of changes to which the Authority and Contractor agree because of revisions to the scope of UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT**,** this contract allows for no price increases.

The Authority to make payments to the Contractor, in accordance with and subject to the provisions of Section 4 of this Contract.

3. Contract Execution

The Contractor must:

A. Perform all services in a responsible manner, supplying only service that meets or exceeds the Authority's Specifications;

B. Sustain all loss or damage arising out of the nature of the work to be done, or from any unforeseen obstruction or difficulty which contractor may encounter in the prosecution of the work, or from the action of the elements;

C. Be responsible for all accidents their employees, or agents may incur in the contract's execution;

D. Hold the Authority and its representatives harmless from liability of any nature or kind on account of use of any copyrighted or un-copyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used under this Contract. The Contractor must likewise hold harmless and indemnify the Authority and its representatives from all:

1. suits, claims, or actions,

2. costs, either for defense or for settlements, and

3. damages to which the Authority or its representatives might be exposed by reason of an injury or alleged injury, to the person or property of another:

   a. in the execution of the Contract, or

   b. from actions the Authority or its representatives take on the Contractor's behalf, except in cases where such suits, claims, actions, or costs are found to be based on the Authority's negligence. For purposes of this paragraph, "its representatives" means "the Four Rivers Sanitation Authority's trustees, employees, agents, assigns, and their heirs."

E. Comply with all applicable requirements of the Americans with Disabilities Act (ADA), the Occupational Safety and Health Act (OSHA), rules and regulations of the US Department of Transportation (DOT), and the Federal Drug Free Work Place Act, and will:

1. complete all OSHA, ADA, and DOT required supervisory, employee and customer training,

2. document compliance as required,

3. ensure that persons in safety-sensitive positions associated with loading, transportation, and delivery of the merchandise or service detailed in these specifications are subject to all required drug and alcohol testing and are properly licensed,

4. prepare and make available all required information and documentation, and

5. hold harmless and indemnify the Authority and the Authority's representatives as defined in Section 3.12 from all:

   a. Suits, claims, or actions;

   b. Costs, either for defense (including but not limited to reasonable attorney's fees and expert witness fees) or for settlements, and;

   c. Damages of any kind (including but not limited to fines, actual, punitive, and compensatory damages)

relating in any way to or arising out of the ADA or the OSHA, to which said firm is exposed or which it incurs in the execution of the contract.

F. Adopt and promulgate written sexual harassment policies that include, at a minimum, the following information:

1. the illegality of sexual harassment;
2. the definition of sexual harassment under Illinois State law;
3. a description of sexual harassment, utilizing examples;
4. Contractor's internal complaint process including penalties;
5. the legal recourse, investigative and complaint process available through the Illinois Department of Human Rights and the Illinois Human Rights Commission;
6. directions on how to contact the Department and the Commission; and
7. protection against retaliation as provided by Section 6-101 of Illinois Human Rights Act.

Upon request, Contractor will provide the Illinois Department of Human Rights with the information described in F1 through F7above.

G. Maintain all specified insurance for the duration of the contract.

4. Payments to Contractor

If the Authority receives an acceptable invoice for conforming service prior to the fifth day of the month, the Authority to issue payment before the fifth day of the succeeding month. If received on or after the fifth day of the month, payment will be issued the following month.

5. Subcontracts

No part of the work herein provided for is to be sublet or subcontracted without the express consent of the Authority, and in no case will consent relieve said Contractor from the obligation herein entered into, or change the terms of this Contract.

6. Contractor's Responsibility

This Contract must extend to and be binding upon the successors and assigns, and upon the heirs, administrators, executors, and legal representatives of the Contractor.

7. Counterparts

This Agreement may be executed and recorded in counterparts, each of which is to be deemed an original and all of which, when taken together, constitutes one and the same instrument. The Parties hereby acknowledge and agree that facsimile signatures or signatures transmitted by electronic mail in so-called “pdf” format must be legal and binding and must have the same full force and effect as if an original of this Agreement had been delivered. Each of the parties (a) intend to be bound by the signatures on any document sent by facsimile or electronic mail, (b) are aware that the other party will rely on such signatures, and (c) hereby waive any defenses to the enforcement of the terms of this Agreement based on the foregoing forms of signature.

7. Time
The Contractor agrees to all schedules specified in this request for proposals.

8. Seals
IN WITNESS WHEREOF, the parties have hereunto set their hands, and are duly authorized to enter into such contracts on behalf of their respective organizations.

_____
Name of Firm - Contractor

By_____
Authorized Signature

ATTEST:

By: _____

Its: _____

Four Rivers Sanitation Authority
Winnebago County, Illinois

By _____
Executive Director

ATTEST: _____
Director of Management Services

STATE OF ILLINOIS)
COUNTY OF WINNEBAGO)

On this ___ day of _____, 20__, before me, a notary public within and for said County, personally appeared Timothy S. Hanson and Julia Scott-Valdez, to me personally known, who, being each by me duly sworn did say that they are respectively, the Executive Director and Director of Management Services of the Four Rivers Sanitation Authority, named in the foregoing instrument, and that said instrument was signed and sealed in behalf of the Authority, and said Executive Director and Director of Management Services acknowledge said instrument to be the free act and deed of said Authority.

(SEAL)

_____
Notary Public

X
PERFORMANCE BOND

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

X
PERFORMANCE BOND
FOUR RIVERS SANITATION AUTHORITY
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

KNOW ALL BY THESE PRESENTS, that WHEREAS, the Four Rivers Sanitation Authority has awarded to:
_____hereinafter designated as the

"Principal", a contract, dated, _____, for the Four Rivers Sanitation Authority.

WHEREAS, said Principal is required under the terms of said Contract to furnish a bond for the faithful performance of said Contract (the "Bond");

NOW, THEREFORE, we the Principal and_____,
as Surety, are firmly bound unto the Four Rivers Sanitation Authority in the penal sum of
_____ Dollars ($_____)
lawful money of the United States for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents for a performance bond. The conditions of this obligation is such that if the said Principal does well and faithfully performs all the conditions and covenants of said Contract, according to the true intent and meaning thereof, upon its part to be kept and performed, then the above obligation is to be null and void, otherwise to remain in full force and effect.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bounden Principal, its heirs, executors, administrators, successors or assigns, must in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the said Contract, including the provisions for liquidated damages in the said Contract, any changes, additions or alterations thereof made as therein provided, on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and must indemnify and save harmless the Four Rivers Sanitation Authority, its officers and agents, as therein stipulated, then this obligation becomes null and void; otherwise it must be and remain in full force and effect. And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed there under or the specifications accompanying the same and no inadvertent overpayment of progress payments will in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications or of any inadvertent overpayment of progress payments. Four Rivers Sanitation Authority must be named as beneficiary on this Performance Bond.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their seal this _____day of _____, 20_____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

Principal

_____

(Seal)

By

_____

Name:

_____

Title:

_____

Date:

ATTEST:

_____

Secretary

_____

Surety

_____

(Seal)

By

_____

Name:

_____

Title:

_____

Date:

Countersigned_____

SECTION XI
LABOR & MATERIAL PAYMENT BOND

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

XI
LABOR & MATERIAL PAYMENT BOND
FOUR RIVERS SANITATION AUTHORITY
REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

TO: _____Contractor Name

_____Contractor City, State

KNOW ALL MEN BY THESE PRESENTS:

That:_____(Contractor)

as Principal, and _____

a corporation of the State of _____ as Surety, are held and firmly bound unto the Four Rivers Sanitation Authority, as Obligee, for the use and benefit of claimants as hereinafter defined in the amount of

_____ Dollars ($_____), for the payment where of Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____20___ Entered into a Contract with Obligee for _____ in accordance with contract documents prepared by the Four Rivers Sanitation Authority which Contract is by reference made a part hereof, and is hereinafter referred to as "the Contract".

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Principal shall promptly pay for all laborers, workers and mechanics engaged in the work under the Contract, and not less than the general prevailing rate of hourly wages of a similar character in the locality in which the work is performed, as determined by the State of Illinois Department of Labor pursuant to the Illinois Compiled Statutes 280 ILCS 130 / 1-12 et.seq. and for all material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect.

1. A claimant is deemed as any person, firm, or corporation having contracts with the Principal or with any of Principal's subcontractors for labor or materials furnished in the performance of the Contract on account of which this Bond is given.
2. Nothing in this Bond contained shall be taken to make the Obligee liable to any subcontractor, material man or laborer, or to any other person to any greater extent than it would have been liable prior to the enactment of The Public Construction Bond Act, approved June 20, 1931, as amended; provided further, that any person having a claim for labor and materials furnished in the performance of the Contract shall have no right of action unless he shall have filed a verified notice of such claim with the Obligee within 180 days after the date of the last item of work or the furnishing of the last item of materials, which claim shall have been verified and shall contain the name and address of the claimant, the business address of the claimant within the State of Illinois, if any, or if the claimant be a foreign corporation having no place of business within the State the principal place of business of the corporation, and in all cases of partnership the names and residences of each of the partners, the name of the Contractor for the Obligee, the name

of the person, firm or corporation by whom the claimant was employed or to whom such claimant furnished materials, the amount of the claim and a brief description of the public improvement for the construction or installation of which the contract is to be performed. No defect in the notice herein provided for shall deprive the claimant of its right of action under the terms and provisions of this Bond unless it shall affirmatively appear that such defect has prejudiced the rights of an interested party asserting the same.

3. No action shall be brought on this Bond until the expiration of 120 days after the date of the last item of work or of the furnishing of the last item of material except in cases where the final settlement between Obligee and the Contractor shall have been made prior to the expiration of the 120 day period, in which case action may be taken immediately following such final settlement; nor shall any action of any kind be brought later than 6 months after the acceptance by the Obligee of the work. Such suit shall be brought only in the circuit court of this State in the judicial district in which the Contract is to be performed.

4. Surety hereby waives notice of any changes in the Contract, including extensions of time for the performance thereof.

5. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

6. The Principal and Surety shall be liable for any attorneys' fees, engineering costs, or court costs incurred by the Obligee relative to claims made against this Bond.

Signed and Sealed this _____day of _____, 20_____

CONTRACTOR **SURETY**

_____ _____

By: _____ By: _____
Signature Attorney-in-Fact

_____ _____
Title Resident Agent

ATTEST:

_____
Corporate Secretary (Corporations only)

SECTION XII
PROJECT LOCATION MAP AND PLANS

REQUEST FOR PROPOSALS #24-401
UNDERGROUND STORAGE TANK REMOVAL AND REPLACEMENT

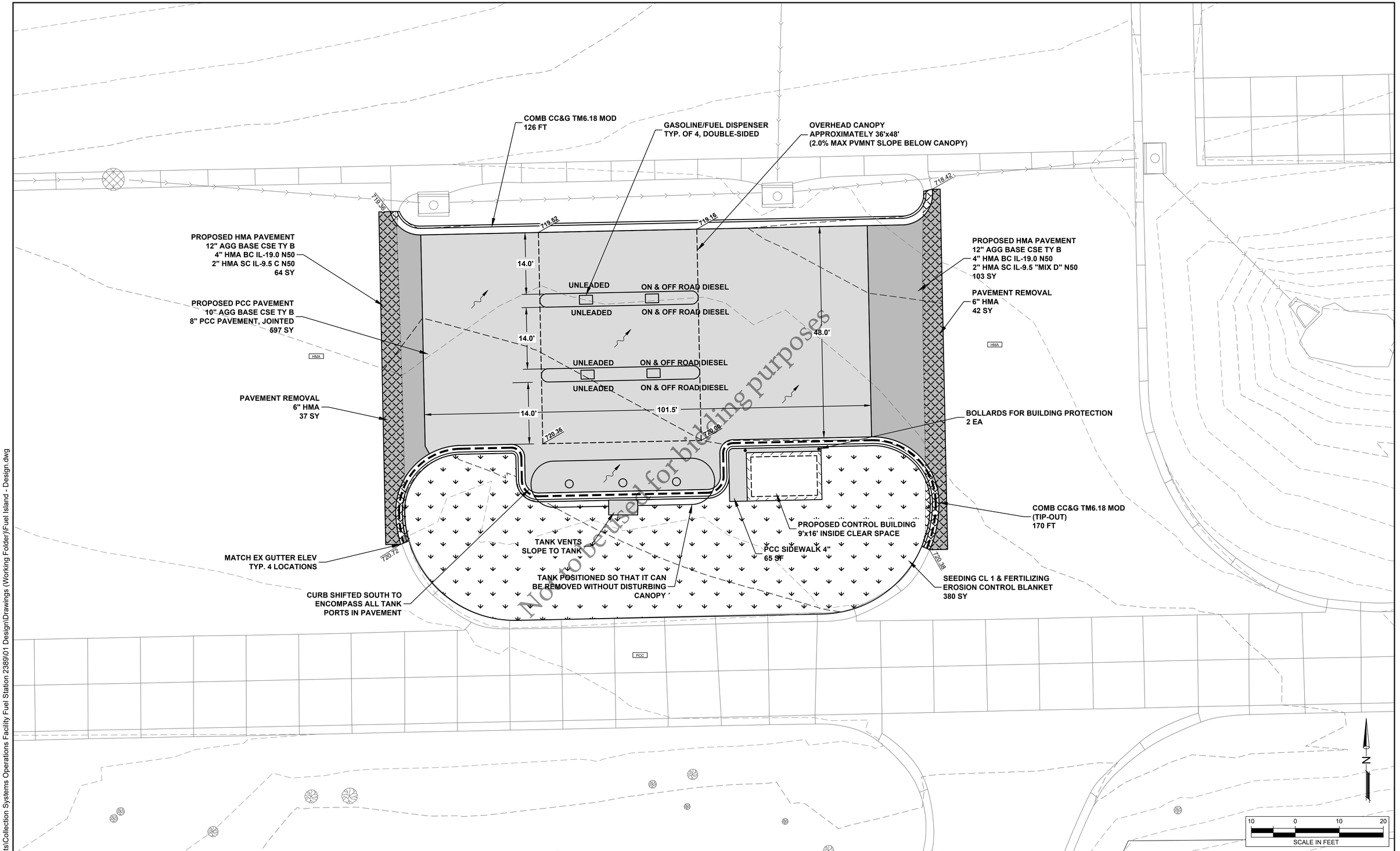
Four Rivers Sanitation Authority

UST Removal and Replacement Project Location

- Existing Fuel Tanks
- Plant Buildings
- FRSA Plant Perimeter

N

By: J. Kink
Produced: 3/22/2024



file: I:\District Projects\Collection Systems Operations Facility Fuel Station 2389\01 Design\Drawings (Working Folder)\Fuel Island - Design.dwg

Four Rivers Sanitation Authority

No.	DATE	REVISION	INT.

NEW FUEL ISLAND

PLAN

Sheet No. 1 of 4

Date: 1/26/2024

1" UE SITE LIGHTING

2" WATER MAIN WITH YARD HYDRANT SEE DETAIL

4" FRSA PLANT WATER (PRIVATE) WITH VALVE & VALVE BOX

2" FRSA GAS SERVICE STUB WITH VALVE

6" PVC CONDUIT COMED UE

CONCRETE DUCTBANK
2 - 4" CONDUITS FOR ELEC
2 - 4" CONDUITS FOR FIBER
TERMINATED AT QUAZITE BOX.
EXTEND CONDUITS FROM HANDHOLE TO CONTROL BUILDING AND PULL CONDUCTORS AS NEEDED.

1" UE SITE LIGHTING

EXISTING 4" PVC IRRIGATION SLEEVE, TYP.
(IRRIGATION TO BE COMPLETED BY OTHERS AT LATER DATE)

PROPOSED CONTROL BUILDING

10 0 10 20
SCALE IN FEET

N

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Four Rivers Sanitation Authority

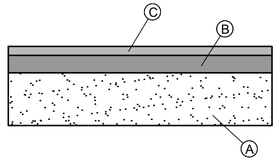
No.	DATE	REVISION	INT.

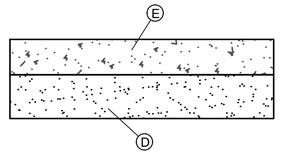
NEW FUEL ISLAND

UTILITIES

Sheet No. 2 of 4

Date: 1/26/2024

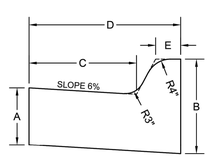




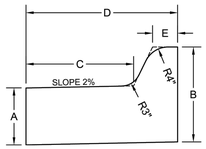
LEGEND

- (A) AGGREGATE BASE COURSE, TY. B 12" (4" CA-02, 8" CA-06)
- (B) HMA BINDER COURSE, IL-19.0, N50, 4"
- (C) HMA SURFACE COURSE, MIX 'D', N50, 2"
- (D) AGGREGATE BASE COURSE, TY. B 10" (4" CA-02, 6" CA-06)
- (E) PCC PAVEMENT, 8" (JOINTED)

TYPICAL PAVEMENT SECTIONS



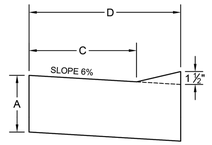
CARRY WITH CURB



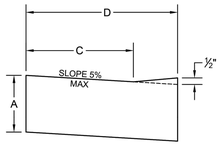
TIP-OUT WITH CURB

TABLE OF DIMENSIONS (INCHES)

A	9
B	15
C	17
D	24
E	4



DEPRESSED CURB



DEPRESSED CURB ADJACENT TO ADA ROUTE

Four Rivers Sanitation Authority

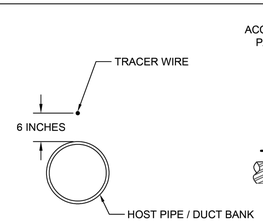
FRSA TREATMENT PLANT
COMBINATION CONCRETE CURB & GUTTER TYPE M6.18, MODIFIED

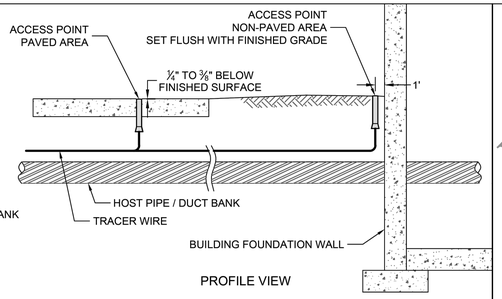
(NOT TO SCALE)

rev. 1/23/24

EXISTING FUEL PUMPS - NORTH VIEW
(3 DISPENSERS TOTAL)

EXISTING FUEL PUMPS - SOUTH VIEW
(3 DISPENSERS TOTAL)





SECTION VIEW

PROFILE VIEW

NOTES:

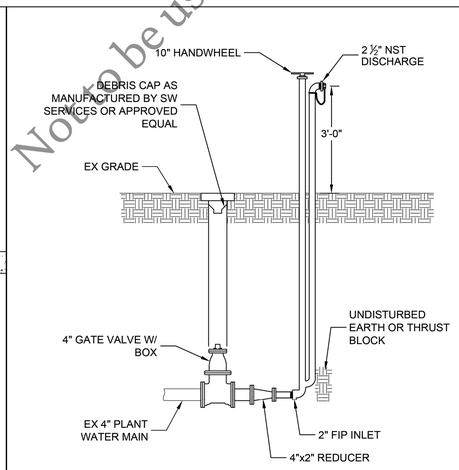
1. ALL NEW UNDERGROUND PIPING AND DUCT BANKS SHALL BE BURIED WITH LOCATING TRACER WIRE APPROXIMATELY 6 INCHES ABOVE THE TOP OF PIPE. TRACER WIRES SHALL BE TERMINATED AS SHOWN ON THE PLANS OR AS DIRECTED.
2. TRACER WIRE SHALL BE COPPER-CLAD STEEL HIGH STRENGTH 12 AWG AS MFG BY COPPERHEAD INDUSTRIES AND SHALL BE COLOR CODED PER APWA UNIFORM COLOR CODE
3. ACCESS POINTS SHALL BE PROVIDED AT EACH END OF NEW PIPING, OR IN BETWEEN ENDS OF PIPING IF REQUIRED. THE MAXIMUM LINEAR DISTANCE BETWEEN ACCESS POINTS SHALL BE 800 FEET. ACCESS POINTS IN NON-PAVED AREAS SHALL BE *SNAKEPIT LITE DUTY ADJUSTABLE SINGLE TERMINAL* ACCESS POINTS AS MFG BY COPPERHEAD INDUSTRIES, AND SHALL BE INSTALLED FLUSH WITH FINISHED GROUND ELEVATION. ACCESS POINTS IN PAVED AREAS SHALL BE *SNAKEPIT ROADWAY SINGLE TERMINAL CAST IRON LID* ACCESS POINTS AS MFG BY COPPERHEAD INDUSTRIES, AND SHALL BE INSTALLED ¼" TO ⅜" BELOW FINAL PAVEMENT ELEVATION.

Four Rivers Sanitation Authority

FRSA TREATMENT PLANT
TRACER WIRE & ACCESS POINTS DETAIL

(NOT TO SCALE)

rev. 8/10/21



NOTES:

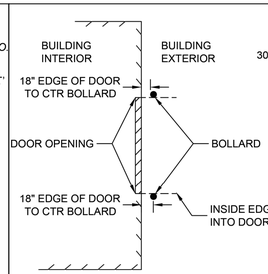
1. YARD HYDRANTS SHALL BE *KUPFERLE FOUNDRY CO. MAINGUARD #80WD* OR APPROVED EQUAL. YARD HYDRANTS SHALL HAVE A 2" BODY, 10" HANDWHEEL, NOZZLE CAP & CHAIN, AND BE FREEZE PROOF SELF DRAINING.
2. YARD HYDRANT CONNECTION TO WATER MAIN SHALL INCLUDE A DIELECTRIC FITTING FOR UNLIKE MATERIALS.

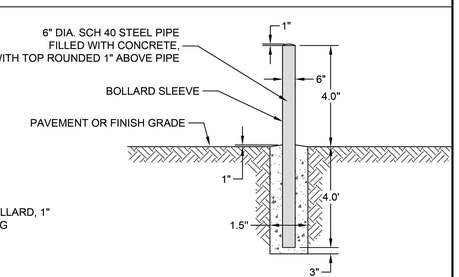
Four Rivers Sanitation Authority

FRSA TREATMENT PLANT
YARD HYDRANT ASSEMBLY DETAIL

(NOT TO SCALE)

rev. 1/23/24





NOTES:

1. BOLLARD PLACEMENT IN FRONT OF BUILDINGS SHALL BE 18 INCHES FROM CENTER OF BOLLARD TO THE FACE OF THE BUILDING. THE INSIDE EDGE OF THE BOLLARD SHALL BE 1 INCH INTO THE DOOR OPENING.
2. BOLLARD PLACEMENT AT OTHER LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.
3. BOLLARD PIPE SHALL BE 6" DIA. SCHEDULE 40 STEEL PIPE.
4. THE OUTSIDE OF THE BOLLARD PIPE SHALL BE PAINTED WITH A RUST PROHIBITIVE PRIMER.
5. STEEL PIPE FOR BOLLARDS SHALL BE ENCASED IN CONCRETE BELOW FINISH GRADE. THE TOP OF THE CONCRETE ENCASEMENT SHALL BE FINISHED TO 1" ABOVE FINISH GRADE AT THE STEEL PIPE.
6. STEEL PIPE FOR BOLLARDS SHALL BE FILLED WITH CONCRETE, AND ROUNDED 1" ABOVE THE TOP OF THE STEEL PIPE.
7. BOLLARDS SHALL INCLUDE A SLEEVE. SLEEVES SHALL BE ROUND SHAPE, HIGH DENSITY POLYETHYLENE WITH 0.17" WALL THICKNESS, 7" DIA., COLOR YELLOW, WITH TWO WHITE REFLECTIVE STRIPES. SLEEVES SHALL BE *POST GUARD BOLLARD COVER CL1386NN, 7" DIA., 52" HEIGHT.*
8. BOLLARD SLEEVES SHALL BE SUPPLIED AND INSTALLED AS A SINGLE UNIT. BOTTOM OF SLEEVE SHALL BE TRIMMED TO MATCH SLOPE OF PAVEMENT.
9. NO PIECING, PAINTING, OR OTHERWISE MODIFYING THE SLEEVE WILL BE ALLOWED.

Four Rivers Sanitation Authority

FRSA TREATMENT PLANT
BOLLARD DETAIL

(NOT TO SCALE)

rev. 10/13/23

Four Rivers Sanitation Authority

No.	DATE	REVISION	INT.

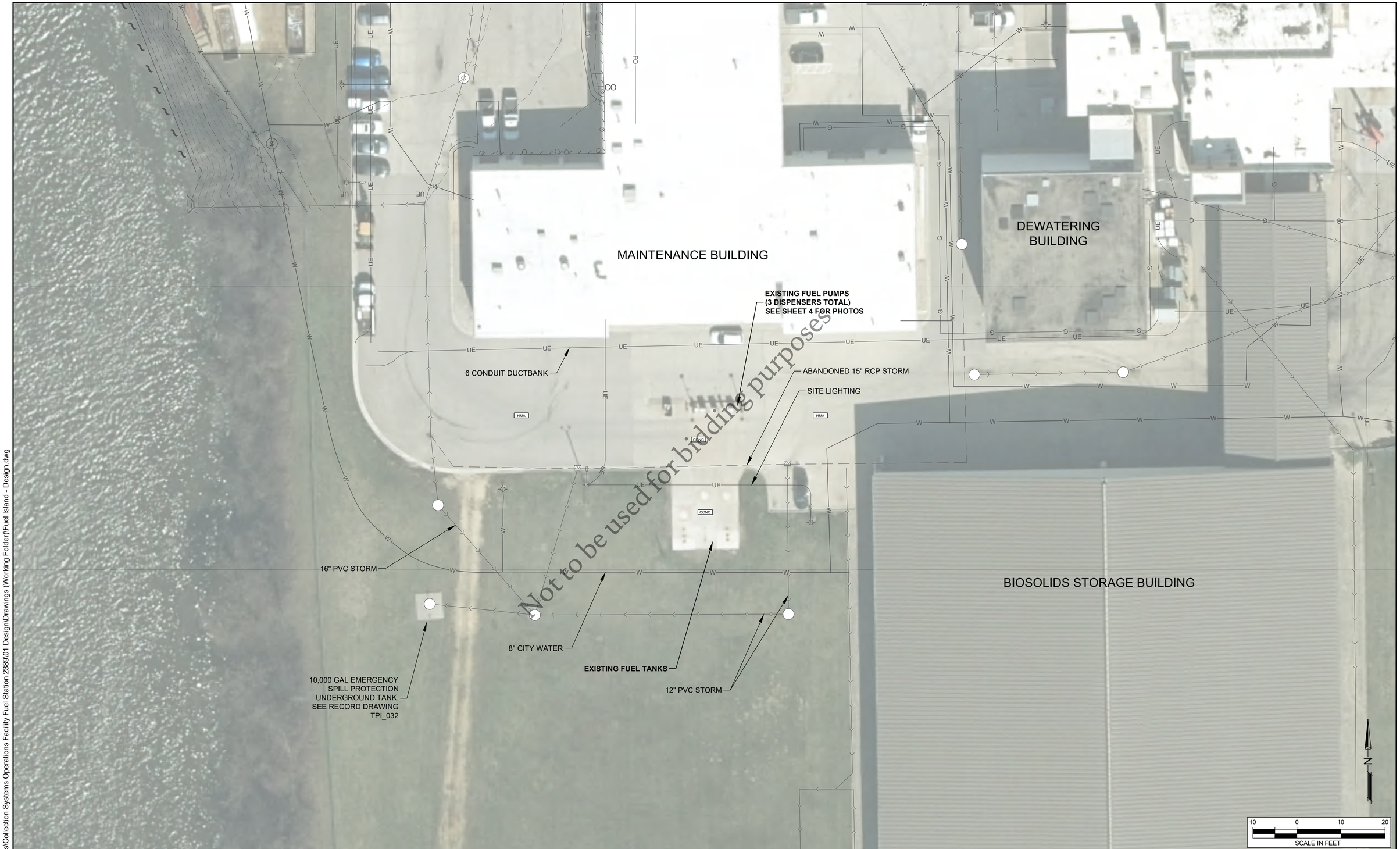
EXISTING FUEL ISLAND AND MISC. DETAILS

DETAILS

Sheet No. 3 of 4

Date: 1/26/2024

file: I:\District Projects\Collection Systems Operations Facility Fuel Station 2389\01 Design\Drawings (Working Folder)\Fuel Island - Design.dwg



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Four Rivers Sanitation Authority

No.	DATE	REVISION	INT.

EXISTING FUEL ISLAND

UTILITIES

Sheet No. 4 of 4

Date: 1/26/2024