

# PROJECT MANUAL

AUGUST 14, 2024

## CAPE GIRARDEAU COUNTY REORGANIZED COMMON SEWER DISTRICT

### LAGOON CLOSURES

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CAPE GIRARDEAU COUNTY, MISSOURI



113 West Main Street  
Jackson, MO 63755  
(573) 243-4080  
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# TECHNICAL SPECIFICATIONS

## LAGOON CLOSURES

Cape County Reorganized Common Sewer District  
Jackson, Missouri

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## **BIDDER REQUIREMENTS**

### **1. SCOPE OF WORK**

The project scope shall include closure of one (1) waste water sewer lagoon at the locations presented in the bidding documents.

### **2. DEFINITIONS**

**Engineer or designated representative:** When the term "Engineer or designated representative" is used herein, it shall refer to Brian Strickland, Strickland Engineering; 113 W. Main Street, Ste. 1, Jackson, Missouri 63755; bstrick@stricklandengineering.com; 573-243-9267.

**Owner:** When the term "Owner" is used herein, it shall refer to the Cape Girardeau County Reorganized Common Sewer District; 3054 State Highway FF, Jackson, Missouri 63755; service@capecountysewer.org; 573-837-0588.

### **3. BID INSTRUCTIONS**

In order to receive consideration, bids must be made in strict accordance with the following:

- a. Submit a separate bid for each lagoon that the bidder desires to be considered. District will award a contract for each lagoon closure
- b. Make bid(s) on the forms provided herein, properly signed and with all items filled out. Do not change the wording of the bid form and do not add words to the bid form. Unauthorized conditions, limitations or provisions attached to the bid will be cause for rejection of the bid(s).
- b. No telegraphic bid or telegraphic modification of a bid will be considered. No bids received after the time fixed for receiving them will be considered. Late bids will be returned to the Bidder unopened.
- c. Address bids to the Owner, and deliver to the address given on the Bid Form, on or before **10 am, August 29, 2024**. Enclose each bid in a sealed envelope bearing the title of the work, the name of the Bidder, and the date and hour of the bid opening. Submit only the original signed bid document for each project.
- d. It is the sole responsibility of the bidder to see that the bid is received on time.

#### **4. INVOICING AND PAYMENT**

Each invoice should be itemized in accordance with items listed on the contract. Failure to comply with this requirement may delay processing of invoices for payment. Unless otherwise provided for in the solicitation documents, payment for all equipment, supplies, and/or services required herein shall be made in arrears. The Owner shall not make any advance deposits.

The Owner assumes no obligation for equipment, supplies, and/or services shipped or provided in excess of the quantity ordered. Any unauthorized quantity is subject to the Owner's rejection and shall be returned at the Bidder's expense.

#### **5. EXAMINATION OF DOCUMENTS AND SITE OF WORK**

Before submitting a bid, each bidder shall examine the drawings carefully, read the specifications and all other proposed contract documents, and visit the site of the work. Each Bidder shall fully inform themselves, prior to bidding, as to existing conditions and limitations under which the work is to be performed and shall include in his bid a sum to cover the cost of items necessary to perform the work, as set forth in the proposed contract documents. No allowance will be made to a Bidder because of lack of such examination or knowledge. The submission of a bid will be considered conclusive evidence that the Bidder has made such examination.

The contract price shall include any necessary permits and licenses required by law incidental to the work. Local ordinances requiring building permits are not applicable to the state. The Bidder will comply with local laws involving safety in the prosecution of the work.

#### **6. INTERPRETATION**

No oral interpretations will be made to any bidder as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction. Every request for interpretation shall be made in writing and submitted with all supporting documents not less than eight (8) days before opening of bids. The request shall be sent directly to the Engineer. Every interpretation made to a Bidder will be in the form of an addendum and will be sent as promptly as is practicable to all persons to whom plans and specifications have been issued. All such addenda shall become part of the contract documents.

#### **7. PROOF OF COMPETENCY OF BIDDER**

A Bidder may be required to furnish evidence, satisfactory to the Owner, that he and his proposed subcontractor(s) have sufficient means and experience in the types of work called for to assure completion of the contract in a satisfactory

manner. The Bidder and Subcontractor(s) shall have experience with similar lagoon closure projects.

## **8. WITHDRAWAL OF BIDS**

After the bid opening, a Bidder may be permitted to withdraw a bid prior to award at the sole discretion of the Owner if there is a verifiable error in the bid and enforcement of the bid would impose an unconscionable hardship on the Bidder. This withdrawal will be considered only after receipt of a written request and supporting documentation from the Bidder.

Withdrawal shall be the Bidder's sole remedy for an error other than an obvious clerical error. Withdrawal of a bid may result in forfeiture of the bid bond.

## **9. AWARD OR REJECTION OF BIDS**

The Contract, if awarded, will be made on an "All or None" basis using the "lowest and best" principle of award, subject to the Owner's right to reject any or all bids and to waive informality and irregularity in the bids and in the bidding.

## **10. CONTRACT DOCUMENTS**

The contract expresses the complete agreement of the parties and performance shall be governed solely by the specifications and requirements contained therein. Any change, whether by modification and/or supplementation, must be accomplished by a formal contract amendment signed and approved by and between the duly authorized representative of the Bidder and the duly authorized representative of the Owner, by a modified purchase order prior to the effective date of such modification. The Bidder expressly and explicitly understands and agrees that no other method and/or no other document, including correspondence, acts, and oral communications by or from any person, shall be used or construed as an amendment or modification.

## **11. SUBMITTALS**

The Architect/Engineer/Designer review of submittals is only for the limited purpose of checking for conformance with information given and ensuring that they conform to design intent.

## **12. WORK QUALITY**

Inspection of Work: The Owner, Engineer, or designated representative shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other data and records relating to the work. If requested, the Bidder shall at any time before final acceptance of the work uncover any portion of the finished work as directed for inspection. After examination, the Bidder shall

restore said portions of the work to the standards required by the contract. Should the work thus exposed and examined prove acceptable, the actual cost of uncovering, removing and replacing shall be paid by the Owner. Should the work so exposed and examined prove unacceptable, the uncovering, removing and replacing shall be at the expense of the Bidder.

Defective Work: All work which has been rejected shall be remedied, or if necessary, removed and replaced in an acceptable manner by the Bidder at its expense. If the Bidder fails to remedy or replace such defective work immediately after receiving written notice from the Owner, Engineer, or designated representative, the Owner may employ labor to correct the defective work, and the cost incurred in making such corrections shall be deducted from the payment due or to become due the Bidder under this contract.

Warranty: The Bidder will provide a one-year warranty for parts and labor on all building material, and equipment or a standard manufacturer's warranty whichever is greater. All warranties, including extended service agreements shall begin upon Owner's written acceptance of the punch list items.

Bidder's Responsibility for Work. Until the Owner, Engineer, or designated representative, accepts the work, it shall be in the custody and under the charge and care of the Bidder. The Bidder shall rebuild, repair, restore or make good at its own expense any lost or stolen Owner-owned material and all injuries or damages to any portion of the work caused by action of the elements or from any other reason before its completion and final acceptance. Issuance of a payment estimate on any part of the work done will not be considered as final acceptance of any work completed up to that time.

Preservation of Utilities and Monuments: The Bidder shall be responsible for the preservation of all public and private utilities, wires, lines, pipes, poles, cables, and conduit at the site of the work and shall use every precaution necessary to prevent damage or injury thereto. The Bidder shall not disturb or damage any land monument or property landmark until an authorized agent has witnessed or otherwise referenced, their location and shall not remove them until directed by Owner.

Cooperation with Other Contractors: The Bidder shall arrange its work so as not to interfere with the operations of other contractors of the Owner which might be engaged in performing adjacent or nearby work. Whenever work being done by other contractors is contiguous or related to the work involved in this contract, the respective rights of the various contractors will be determined by the Owner, Engineer, or designated representative in order to secure the completion of the work under all contracts in general harmony.

The Bidder will be required to remove all debris from the Owner's property.

Temporary Suspension of Work: The Owner, Engineer, or designated representative shall have authority to suspend work, wholly or in part, for such period or periods of time as he may deem necessary when weather or other conditions are such that in the opinion of the Owner, Engineer, or designated representative the work may be done at a later time with advantage to the Owner or for failure on the part of the Bidder to comply with any of the provisions of the contract. The Bidder may suspend work for reasonable cause with written approval of the Owner, Engineer, or designated representative. Liquidated damages shall not accrue during the period in which work is suspended with the approval of the Owner, Engineer, or designated representative, however, if the suspension is because of the Bidder's failure to comply to any of the provisions of the contract, the Bidder shall not be entitled to an extension of completion time nor to a waiver of liquidated damages. In the event work is suspended, the Bidder shall store all materials in a manner that will protect them from damage, and shall take every precaution to prevent damage or deterioration of, the portions of the work completed. If work has been discontinued for any reason, the Bidder shall give the Owner, Engineer, or designated representative written notice at least forty-eight (48) hours before resuming operations.

### **13. CHANGE ORDERS**

General. All departures from the plans and specifications will be considered unauthorized unless, before proceeding with the work, the Bidder has had delivered to it a change order, signed by the Owner, Engineer, or designated representative, authorizing and directing such changes or departures. All unauthorized work shall be at the Bidder's expense and the Owner, Engineer, or designated representative may order such unauthorized work removed and replaced at the Bidder's expense.

Overhead and Profit on Change Orders. The percentages for overhead and profit charged on Change Orders and Field Work Authorizations shall be negotiated and may vary according to the nature, extent and complexity of the work involved. However, the overhead and profit for the Bidder or subcontractor actually performing the work shall not exceed 15%. When one or more tiers of subcontractors are used, in no event shall any Bidder or subcontractor receive as overhead and profit more than 7% of the cost of the work performed by any of his subcontractors. In no case shall the total overhead and profit paid by the Owner on any change order exceed twenty five percent (25%) of the cost of materials, labor and equipment necessary to put the change order work in place.

Bidder's Procedure for Claims. If the Bidder considers additional compensation may be due for work or material not clearly covered in the contract or ordered in writing by the Owner, Engineer, or designated representative as extra work, or if additional compensation may be requested beyond the scope of such provisions, the Bidder shall notify the Owner, Engineer, or designated representative in

writing of the intention to make a claim before beginning the work in question. If notification is not given and the Owner, Engineer, or designated representative is not afforded proper facilities by Bidder to provide necessary inspection and for keeping strict account of actual cost, the Bidder agrees to waive any claims for additional compensation. Notice by the Bidder, and the fact that the Owner, Engineer, or designated representative has kept account of the cost shall not be construed as substantiating the validity of the claim. The Bidder shall file a written notice of claim for additional compensation in triplicate within 60 days after completing the work in question.

If the claim is against the Owner, the notice of claim shall be personally delivered, or sent by certified mail to the Owner in Jackson, Missouri. All notices of claims shall contain an itemized statement showing completely and fully the items and amounts forming the basis of the claim.

Any claim or an item of any claim, not included in the notice and statement, or any claim included but not clearly defined and specifically set out and itemized or any claim not filed within the time and in the manner provided, shall be forever waived and shall neither constitute the basis of nor be included in any legal action, counterclaim, set-off, or arbitration.

#### **14. GENERAL PERFORMANCE**

This work is to be performed under the general supervision and direction of the Owner and, if awarded any portion of the work, the Bidder agrees to furnish at his own expense all labor and equipment required to complete the work, it being expressly understood that this solicitation is for completed work based upon the price(s) specified. Owner is to have no direction or control over the employees used by the Bidder in performance of the work.

#### **15. REMEDIES AND RIGHTS**

No provision in the contract shall be construed, expressly or implied, as a waiver by the Owner of any existing or future right and/or remedy available by law in the event of any claim by the Owner of the Bidder's default or breach of contract.

The Bidder agrees and understands that the contract shall constitute an assignment by the Bidder to the Owner of all rights, title and interest in and to all causes of action that the Bidder may have under the antitrust laws of the United States or State of Missouri for which causes of action have accrued or will accrue as the result of or in relation to the particular equipment, supplies, and/or services purchased or produced by the Bidder in the fulfillment of the contract with the Owner.

In the event a Bidder becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Bidder may request



Owner to enter into such litigation to protect the interests of the

## **16. QUALITY MANAGEMENT OVERSIGHT**

Owner and the Bidder will work together with regard to inspection and quality management oversight. Owner, Engineer, or other designated representative will be available for hold point inspections at the times established in the project schedule.

## **17. HOLD POINTS**

Hold Points are events that require approval prior to continuation of work. Hold Points occur at definable stages of work or progress phases when succeeding work depends on acceptance of the proceeding work.

The Bidder shall provide a Weekly Schedule to Owner that shows the date and time of the Hold Point quality assurance checks. The Weekly Schedule shall be provided to the Engineer by 4:00 P.M. on the Friday following the scheduled work week. The Hold Point inspections may be rescheduled as needed, but a minimum 24-hour advance notification from the Bidder is required unless otherwise approved by the Owner, Engineer, or other designated representative.

The Hold Points for this project are as follows:

1. Before any grading or land disturbance takes place after installation of erosion control
2. After dewatering all lagoon cells
3. After removal of all improvements scheduled to be removed
4. Before any grading activities take place
5. After final grading, before application of seed and mulch

## **19. INSPECTION AND ACCEPTANCE**

No equipment, supplies, and/or services received by Owner pursuant to a contract shall be deemed accepted until Owner has had reasonable opportunity to inspect said equipment, supplies, and/or services.

All equipment, supplies, and/or services which do not comply with the specifications and/or requirements or which are otherwise unacceptable or defective may be rejected. In addition, all equipment, supplies, and/or services which are discovered to be defective or which do not conform to any warranty of the Bidder upon inspection (or at any later time if the defects contained were not reasonably ascertainable upon the initial inspection) may be rejected.

The Owner reserves the right to return any such rejected shipment at the Bidder's expense for full credit or replacement and to specify a reasonable date

by which replacements must be received.

The Owner's right to reject any unacceptable equipment, supplies, and/or services shall not exclude any other legal, equitable or contractual remedies the Owner may have.

**BID FORM**

To: The Cape Girardeau County Reorganized Common Sewer District  
3054 State Highway FF  
Jackson, MO 63755

Bidder hereby submits a bid for closure of one (1) waste water sewer lagoon at

\_\_\_\_\_.

- 1. The undersigned, having examined the proposed Contract Documents, and having visited the site and examined the conditions affecting the work, hereby proposes and agrees to furnish all labor, materials, equipment and everything which may be necessary or incidental thereto, as proposed by said Contract Documents, all to the satisfaction of the Owner, for the stipulated sum of

\_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_).

- 2. The undersigned, acknowledges having examined and being familiar with the contract documents including the drawings, the Instructions to Bidders, General Conditions, Supplementary Conditions and the body of technical specifications.

- 3. The undersigned acknowledges receipt of Addenda number \_\_\_through\_\_\_ inclusive.

- 4. Enclosed with this bid is bid security in the amount of not less than 5% of the bidder's proposed Contract Sum, the amount being

\_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_).

**IF AN INDIVIDUAL**

\_\_\_\_\_  
Name of individual

\_\_\_\_\_  
Residence address

\_\_\_\_\_  
Social Security Number

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Firm Name, If Any

\_\_\_\_\_  
Address for communications

\_\_\_\_\_  
Signature

**IF A PARTNERSHIP**

\_\_\_\_\_  
Name of Partnership

\_\_\_\_\_  
(State Name and Residence Address of  
All Partners)

\_\_\_\_\_  
Partner

\_\_\_\_\_  
Residence Address

\_\_\_\_\_  
Partner

\_\_\_\_\_  
Residence Address

\_\_\_\_\_  
Address for communications

\_\_\_\_\_  
Federal Tax I.D. Number

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Signature of Either Partner

**IF A CORPORATION**

\_\_\_\_\_  
Name of Corporation

Incorporated under the laws of the State of \_\_\_\_\_

\_\_\_\_\_  
Name and Title of Officer

\_\_\_\_\_  
Signature of officer

\_\_\_\_\_  
Federal Tax I.D. Number

Corporate License No. \_\_\_\_\_

(If a corporation organized in a state other than Missouri, attach Certificate of Authority to do business in the State of Missouri.)

\_\_\_\_\_  
Address for communications

\_\_\_\_\_  
(ATTEST) Secretary

\_\_\_\_\_  
Telephone Number

(SEAL)

(Each bidder must complete the Bid Form by signing in the proper signature line above and by supplying the required information called for in connection with the signature. The information called for is necessary in the proper preparation of the contract and performance bond.)

## SUBCONTRACTOR LISTING

1. For portions of Work equaling or exceeding 1% of the total proposed Contract Sum, the undersigned proposes to use the following subcontractors. Except as otherwise approved by the Owner, the undersigned proposes to perform all other portions of the Work with his own forces.

2. Portion of the Work: Subcontractor name and address:


USE ADDITIONAL SHEETS  
IF REQUIRED

BIDDER: \_\_\_\_\_

PROVIDE SIGNATURE  
IDENTICAL TO THAT  
SHOWN ON THE BID FORM

by \_\_\_\_\_

**BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we

,  
as Principal, and \_\_\_\_\_, as Surety, are held  
firmly bound unto the Owner in the penal sum of  
Dollars

(\$\_\_\_\_\_), to be paid to the Owner, binding themselves, their heirs, executors,  
administrators, successors and assigns, jointly and severally, firmly by these presents.

Sealed with our seals and dated this \_\_\_ day of \_\_\_\_\_, 2024

THE CONDITION OF THIS OBLIGATION is such that:

WHEREAS, the Principal is submitting herewith a bid to the Owner on \_\_\_\_\_, for  
construction or improvement as set out in said bid.

NOW THEREFORE, if the Owner shall accept the bid of the Principal, and if said  
Principal shall properly execute and deliver to the Owner the Contract, Contract Bond,  
Specifications and evidence of insurance coverage in compliance with the requirements  
of the Bid, to the satisfaction of the Owner, then this obligation shall be void and of no  
effect, otherwise to remain in full force and effect.

In the event the said Principal shall, in the judgment of the Owner, fail to comply with  
any requirement as set forth in the preceding paragraph, then the Owner, shall  
immediately and forthwith be entitled to recover the fees, and any other expense of  
recovery.

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

By

Attest: (CORPORATE SEAL)

Attorney in Fact

(SEAL)

\_\_\_\_\_  
Corporate Secretary

Note: This bond must be executed by the Principal and by a Corporate Surety  
authorized to conduct surety business in the State of Missouri.

## **AGREEMENT**

This agreement is made on the date last executed below, between [name of contractor],("Contractor"), and Cape Girardeau County Reorganized Common Sewer District ("Owner") who, for the consideration stated herein, agree as follows:

### **1. SCOPE OF WORK**

The Contractor shall perform everything required to be performed and shall provide and furnish all the labor, materials, necessary tools, expendable equipment, and all utility and transportation services required to perform and complete in a workmanlike manner all the work required under the Contractor's proposal set forth in Attachment "A" which describes the closure of a sewer lagoon located at[address of property], Jackson, Cape Girardeau County Missouri; all in strict accordance with Attachment A (collectively the "Work").

### **2. INSURANCE AND LICENSING**

The Contractor is insured and duly licensed, if applicable.

The Contractor shall furnish and maintain during the life of this contract such Comprehensive General & Automobile Liability and Property Damage Insurance as shall protect him and any Subcontractor performing work covered by this contract, from claims for damages for personal injury, including accidental death, except by persons protected by the Missouri Worker's Compensation statute, and from claims for property damages, which may arise from operations under this contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by either of them and the amounts of such insurance shall be as follows:

#### Comprehensive General Liability

Bodily Injury:

\$100,000.00	Each Person
\$1,000,000.00	Each Occurrence

Property Damage:

\$1,000,000.00	Each Occurrence
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#### Comprehensive Automobile Liability:

Bodily Injury:

\$100,000.00	Each Person
\$300,000.00	Each Occurrence

Property Damage:

\$300,000.00	Each Occurrence
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The Contractor shall take out and maintain during the life of this contract Worker's Compensation Insurance for all employees employed at the site of the project and, in case any work is sublet, the Contractor shall require the Subcontractor similarly to provide Workers' Compensation Insurance for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the project is not protected under the Worker's Compensation statute, the Contractor shall provide, and shall cause each Subcontractor to provide, Employer's Liability Insurance for the protection of his employees not otherwise protected.

The Contractor shall furnish the Owner and Engineer with certificates of insurance covering each of the several items of insurance heretofore mentioned.

### **3. TIME OF COMPLETION**

The Work to be performed under this contract shall be commenced after first payment is received, and shall be diligently prosecuted and substantially completed, no later than 90 calendar days thereafter.

### **4. THE CONTRACT PRICE**

The Owner shall pay to the Contractor for the performance of this contract the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_).

### **5. PAYMENTS**

The Owner shall make payments to the Contractor by check, as follows:

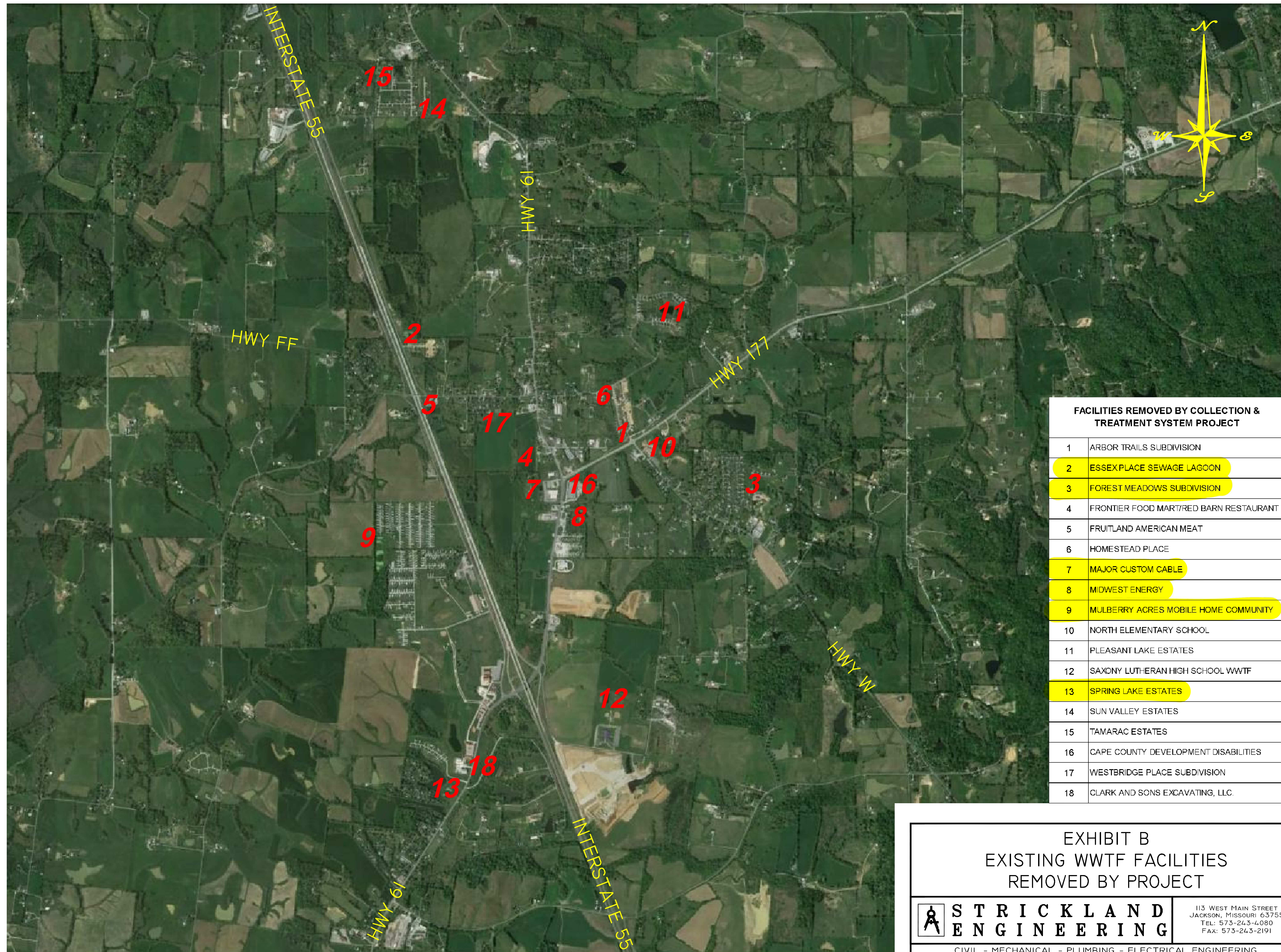
- a. 10% down payment, hand-delivered or mailed to Contractor contemporaneously with the full execution of this Contract and the delivery of the above-referenced insurance and license documents.
- b. An additional payment of 15%, after the inspection at Hold Point 3 as specified in the bidding documents. This payment will be due when Contractor and Owner agree that all of the work through Hold Point 3 has been accomplished.
- c. An additional payment of 50%, after the inspection at Hold Point 6 as specified in the bidding documents. This payment will be due when Contractor and Owner agree that all of the work through Hold Point 6 has been accomplished.
- d. The final retainage payment of 25% shall be due to Contractor seven calendar days after the Work is complete, as specified in the bidding documents, and provided that full completion of any "punch list" items has been accomplished.

**6. MECHANIC'S LIENS**

The Contractor shall not suffer any mechanic's liens or other liens of any kind to attach to the Work. Lien waivers shall be required prior to any payments made in Paragraph 5.


7. The Contractor is to make good, replace, and renew at his own cost and expense, any loss or damage to the work occurring during the carrying out of this contract or prior to the final delivery and acceptance by the Owner of this work by reason of accident, fire, tornado, water, theft, or for any reason whatsoever not caused by the Owner, his agents, or employees. Contractor shall be wholly responsible for the carrying out of this work, and the delivery of the finished work in its entirety for the final acceptance by the Owner.
8. In the event any material alterations or additions are made as herein specified which, in the opinion of the Owner or Owner's Engineer, will require additional time for the execution of any work under this contract, then, in that case, the time of completion of the work shall be extended by such a period of time as may be fixed by the Engineer, and his decision shall be final and binding upon both parties hereto, provided that in such case the Contractor within five (5) days after being notified in writing of such alterations or additions shall request in writing an extension of time, but no extensions of time shall be given for any minor alterations or additions. The Contractor shall not be entitled to any damages or compensation from the Owner on account of such additional time required for the execution of the work.

In Witness Whereof, the parties hereto have caused this instrument to be executed as follows:



FACILITIES REMOVED BY COLLECTION & TREATMENT SYSTEM PROJECT	
1	ARBOR TRAILS SUBDIVISION
2	ESSEX PLACE SEWAGE LAGOON
3	FOREST MEADOWS SUBDIVISION
4	FRONTIER FOOD MART/RED BARN RESTAURANT
5	FRUITLAND AMERICAN MEAT
6	HOMESTEAD PLACE
7	MAJOR CUSTOM CABLE
8	MIDWEST ENERGY
9	MULBERRY ACRES MOBILE HOME COMMUNITY
10	NORTH ELEMENTARY SCHOOL
11	PLEASANT LAKE ESTATES
12	SAXONY LUTHERAN HIGH SCHOOL WWTF
13	SPRING LAKE ESTATES
14	SUN VALLEY ESTATES
15	TAMARAC ESTATES
16	CAPE COUNTY DEVELOPMENT DISABILITIES
17	WESTBRIDGE PLACE SUBDIVISION
18	CLARK AND SONS EXCAVATING, LLC.

**EXHIBIT B**  
**EXISTING WWTF FACILITIES**  
**REMOVED BY PROJECT**

 <b>STRICKLAND ENGINEERING</b>	113 WEST MAIN STREET JACKSON, MISSOURI 63755 TEL: 573-243-4080 FAX: 573-243-2191
CIVIL - MECHANICAL - PLUMBING - ELECTRICAL ENGINEERING LAND SURVEYING	

## LAGOON CLOSURE DESCRIPTIONS

### General Notes

- A. District shall provide sludge testing and removal of the primary cells of the lagoons by a separate contractor.
- B. District will obtain land disturbance permits from the Dept of Natural Resources as required. Contractor shall install and maintain appropriate erosion control measures.
- C. Removal of sludge is anticipated to begin on or near October 1, 2024.
- D. Any signs on fencing, gates, or outfalls should be removed and returned to the District.

### **\* Sludge Testing, Handling, and Disposal-Lagoon**

Testing for metals and plant available nitrogen must be performed prior to the closing the sludge in place, since the design population exceeds 1,500 persons. The sludge residuals may or may not meet the current threshold of sludge closure in place per standards conditions Part III Section H "Closure Requirements." **Since the lagoon is older than fifteen (15) years old it qualifies for a Class B biosolids concerning pathogen reduction. Therefore, testing for fecal coliform is not required.**

If sludge testing reveals that agronomic loading rates cannot be met, then a portion of the sludge will need to be removed and land applied. Additional testing of the sludge and land proposed application site will be needed to prescribe land application rates for the sludge, if land application is chosen as a means of sludge disposal per standards conditions Part III Section G "Land Application."

3. Residuals that are left in place during closure of a lagoon or earthen structure or ash pond shall not exceed the agricultural loading rates as follows:
  - a. Residuals shall meet the monitoring and land application limits for agricultural rates as referenced in Section H of these standard conditions.
  - b. If a wastewater treatment lagoon has been in operation for 15 years or more without sludge removal, the sludge in the lagoon qualifies as a Class B biosolids with respect to pathogens due to anaerobic digestion, and testing for fecal coliform is not required. For other lagoons, testing for fecal coliform is required to show compliance with Class B biosolids limitations. In order to reach Class B biosolids requirements, fecal coliform must be less than 2,000,000 colony forming units or 2,000,000 most probable number. All fecal samples must be presented as geometric mean per gram.
  - c. The allowable nitrogen loading that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. For a grass cover crop, the allowable PAN is 300 pounds/acre.
    - i. PAN can be determined as follows:  
$$(\text{Nitrate} + \text{nitrite nitrogen}) + (\text{organic nitrogen} \times 0.2) + (\text{ammonia nitrogen} \times \text{volatilization factor}^1).$$
<sup>1</sup> Volatilization factor is 0.7 for surface application and 1 for subsurface application.
4. When closing a domestic wastewater treatment lagoon with a design treatment capacity equal or less than 150 persons, the residuals are considered "septage" under the similar treatment works definition. See Section B of these standard conditions. Under the septage category, residuals may be left in place as follows:
  - a. Testing for metals or fecal coliform is not required
  - b. If the wastewater treatment lagoon has been in use for less than 15 years, mix lime with the sludge at a rate of 50 pounds of hydrated lime per 1000 gallons (134 cubic feet) of sludge.
  - c. The amount of sludge that may be left in the lagoon shall be based on the plant available nitrogen (PAN) loading. 100 dry tons/acre of sludge may be left in the basin without testing for nitrogen. If 100 dry tons/acre or more will be left in the lagoon, test for nitrogen and determine the PAN using the calculation above. Allowable PAN loading is 300 pounds/acre.
5. Residuals left within the domestic lagoon shall be mixed with soil on at least a 1 to 1 ratio, the lagoon berm shall be demolished, and the site shall be graded and contain  $\geq 70\%$  vegetative density over 100% of the site so as to avoid ponding of storm water and provide adequate surface water drainage without creating erosion. |

### **1. Essex Place Sewage Lagoon – Drawing C3**

A. Remove the wastewater from the existing cell(s). The wastewater should be pumped to the district's wastewater collection system.

B. Remove all mechanical equipment, piping, valves, and liner materials (e.g., plastic and clay liners) and dispose of in an approved manner. Other above ground utilities, if any, must be removed and properly terminated.

C. Allow solids accumulation on the bottom of the lagoon to dry. After drying the solids should be mixed with soil and left on the bottom of the lagoon at a one to one 1:1 ratio. Berm material may be used for mixing and filling. The balance of any remaining material shall be provided by the contractor from an off-site borrow area. *A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary.*

D. Remove the outfall structure and if appropriate, it can be placed in one of the cells for disposal. The outfall pipe is to be removed three feet back into the ground and plugged with a non-shrinking grout. Any disturbed creek or riverbanks are to be restored.

E. Remove or properly abandon manhole. To properly abandon a manhole, the top portion (to 4 ft. below ground level) of the manhole must be removed to allow proper landscaping. The inlet and outlet must be closed with non-shrinking grout and then the rest of the manhole can be filled with sand or dirt followed by a top layer of dirt to allow establishment of a ground cover.

F. All portions of any other metal or cement structures associated with the lagoon and to be abandoned are to be "pushed in" such that no part of the structure is within 2 feet of the final top ground level. **NO RUBBLE EXCEPT WHAT RESULTS FROM THE DEMOLITION OF THIS FACILITY IS TO BE PLACED IN THE EMPTY STRUCTURES.**

G. Any structure inlet or outlet lines which will not be removed as a result of the demolition must be plugged with a non-shrinking grout. *All wastewater shall be drained from the piping and disposed of in an approved manner prior to placement of grout plugs.*

H. The berms are to be pushed in and the area is to be graded to match existing contours. In no case should grades be less than 1% nor greater than 10%.

I. Erosion control methods shall be established to keep silt on site. Disturbed areas shall be properly stabilized and vegetated. The area is to be covered with suitable quality dirt to establish a groundcover to prevent erosion. The groundcover must be of a type that will establish quickly and continue to maintain a suitable cover with minimal to no additional care after establishment. Disturbed areas will be considered stabilized when perennial vegetation, pavement or structures using permanent materials cover all areas that have been disturbed.

J. Fences, posts, and appurtenances are to be removed according to the plan.

K. If significant rubble is buried at the site, a statement must be placed in the deed for this land parcel showing the area where the buried structure/rubble is located.

L. All valves, mechanical devices, manhole lids and cone sections currently on the closeout locations shall remain the property of the Sewer District and delivered to the Fruitland WWTF.

*Contractor shall be responsible for disposal of all material unless otherwise stated.*

*Contractor shall be responsible for any additional fill to be provided from an off-site borrow area, as needed.*

## 2. Forest Meadows Sewage Lagoon – Drawing C4

**\* This lagoon system will need to have the sludge tested and /or removed.**

A. Remove the wastewater from the existing cell(s). The wastewater should be pumped to the district's wastewater collection system.

B. Remove all mechanical equipment, piping, valves, and liner materials (e.g., plastic and clay liners) and dispose of in an approved manner. Other above ground utilities, if any, must be removed and properly terminated.

C. Allow solids accumulation on the bottom of the lagoon to dry. After drying the solids should be mixed with soil and left on the bottom of the lagoon at a one to one 1:1 ratio. Berm material may be used for mixing and filling. The balance of any remaining material shall be provided by the contractor from an off-site borrow area. *A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary.*

D. The outfall pipes are to be removed three feet back into the ground and plugged with a non-shrinking grout. Any disturbed embankments are to be stabilized and restored.

E. Remove or properly abandon manhole. To properly abandon a manhole, the top portion (to 4 ft. below ground level) of the manhole must be removed to allow proper landscaping. The inlet and outlet must be closed with non-shrinking grout and then the rest of the manhole can be filled with sand or dirt followed by a top layer of dirt to allow establishment of a ground cover.

F. All portions of any other metal or cement structures associated with the lagoon and to be abandoned are to be "pushed in" such that no part of the structure is within 2 feet of the final top ground level. **NO RUBBLE EXCEPT WHAT RESULTS FROM THE DEMOLITION OF THIS FACILITY IS TO BE PLACED IN THE EMPTY STRUCTURES.**

G. Inlet or outlet lines which will not be removed as a result of the demolition must be plugged with a non-shrinking grout. *All wastewater shall be drained from the piping and disposed of in an approved manner prior to placement of grout plugs.*

H. The berms are to be pushed in and the area is to be graded to match existing contours. In no case should grades be less than 1% nor greater than 10%.

I. Erosion control methods shall be established to keep silt on site. Disturbed areas shall be properly stabilized and vegetated. The area is to be covered with suitable quality dirt to establish a groundcover to prevent erosion. The groundcover must be of a type that will establish quickly and continue to maintain a suitable cover with minimal to no additional care after establishment. Disturbed areas will be considered stabilized when perennial vegetation, pavement or structures using permanent materials cover all areas that have been disturbed. Interim diversion ditches, swales, or other devices may be required to divert off site water from the project area.

J. Fences, posts, and appurtenances are to be removed according to the plan.

K. If significant rubble is buried at the site, a statement must be placed in the deed for this land parcel showing the area where the buried structure/rubble is located.

*Contractor shall be responsible for disposal of all material unless otherwise stated.*

*Contractor shall be responsible for any additional fill to be provided from an off-site borrow area, as needed.*

### 3. Major Custom Cable Lagoon – Drawing C8

**\* This lagoon system will need to have the sludge tested and /or removed.**

A. Remove the wastewater from the existing cell(s). The wastewater should be pumped to the district's wastewater collection system.

B. Remove all mechanical equipment, piping, valves, and liner materials (e.g., plastic and clay liners) and dispose of in an approved manner. Other above ground utilities, if any, must be removed and properly terminated.

C. Allow solids accumulation on the bottom of the lagoon to dry. After drying the solids should be mixed with soil and left on the bottom of the lagoon at a one to one 1:1 ratio. Berm material may be used for mixing and filling. The balance of any remaining material shall be provided by the contractor from an off-site borrow area. *A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary.*

D. Remove the outfall structure and if appropriate, it can be placed in one of the cells for disposal. The outfall pipe is to be removed three feet back into the ground and plugged with a non-shrinking grout. Any disturbed creek or riverbanks are to be restored.

E. All portions of any other metal or cement structures associated with the lagoon and to be abandoned are to be "pushed in" such that no part of the structure is within 2 feet of the final top ground level. **NO RUBBLE EXCEPT WHAT RESULTS FROM THE DEMOLITION OF THIS FACILITY IS TO BE PLACED IN THE EMPTY STRUCTURES.**

F. Any structure inlet or outlet lines which will not be removed as a result of the demolition must be plugged with a non-shrinking grout. *All wastewater shall be drained from the piping and disposed of in an approved manner prior to placement of grout plugs.*

G. The berms are to be pushed in and the area is to be graded to match existing contours. In no case should grades be less than 1% nor greater than 10%.

H. Erosion control methods shall be established to keep silt on site. Disturbed areas shall be properly stabilized and vegetated. The area is to be covered with suitable quality dirt to establish a groundcover to prevent erosion. The groundcover must be of a type that will establish quickly and continue to maintain a suitable cover with minimal to no additional care after establishment. Disturbed areas will be considered stabilized when perennial vegetation, pavement or structures using permanent materials cover all areas that have been disturbed. Interim diversion ditches, swales, or other devices may be required to divert off site water from the project area.

I. Fences, posts, and appurtenances must be repaired and secured to prevent public access for a period of one (1) year.

*Contractor shall be responsible for disposal of all material unless otherwise stated.*

*Contractor shall be responsible for any additional fill to be provided from an off-site borrow area, as needed.*

#### 4. Midwest Energy Lagoon – Drawing C9

***\* This lagoon system will need to have the sludge tested and /or removed.***

A. Remove the wastewater from the existing cell(s). The wastewater should be pumped to the district's wastewater collection system.

B. Remove all mechanical equipment, piping, valves, and liner materials (e.g., plastic and clay liners) and dispose of in an approved manner. Other above ground utilities, if any, must be removed and properly terminated.

C. Allow solids accumulation on the bottom of the lagoon to dry. After drying the solids should be mixed with soil and left on the bottom of the lagoon at a one to one 1:1 ratio. Berm material if available, may be used for mixing and filling. The balance of any remaining material shall be provided by the contractor from an off-site borrow area. *A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary.*

D. The outfall pipe is to be removed three feet back into the ground and plugged with a non-shrinking grout. Any disturbed creek or riverbanks are to be restored.

E. All portions of any other metal or cement structures associated with the lagoon and to be abandoned are to be "pushed in" such that no part of the structure is within 2 feet of the final top ground level. **NO RUBBLE EXCEPT WHAT RESULTS FROM THE DEMOLITION OF THIS FACILITY IS TO BE PLACED IN THE EMPTY STRUCTURES.**

F. Any structure inlet or outlet lines which will not be removed as a result of the demolition must be plugged with a non-shrinking grout. *All wastewater shall be drained from the piping and disposed of in an approved manner prior to placement of grout plugs.*

G. Final grading is to match existing contours. In no case should grades be less than 1% nor greater than 10%.

H. Erosion control methods shall be established to keep silt on site. Disturbed areas shall be properly stabilized and vegetated. The area is to be covered with suitable quality dirt to establish a groundcover to prevent erosion. The groundcover must be of a type that will establish quickly and continue to maintain a suitable cover with minimal to no additional care after establishment. Disturbed areas will be considered stabilized when perennial vegetation, pavement or structures using permanent materials cover all areas that have been disturbed. Interim diversion ditches, swales, or other devices may be required to divert off site water from the project area.

I. Fences, posts and appurtenances must be removed.

*Contractor shall be responsible for disposal of all material unless otherwise stated.*

*Contractor shall be responsible for any additional fill to be provided from an off-site borrow area, as needed.*



## 5. Mulberry Acres Lagoon – Drawing C10

**\* This lagoon system will need to have the sludge tested and /or removed.**

A. Remove the wastewater from the existing cell(s). The wastewater should be pumped to the district's wastewater collection system.

B. Remove all mechanical equipment, piping, valves, and liner materials (e.g., plastic and clay liners) and dispose of in an approved manner. Other above ground utilities, if any, must be removed and properly terminated.

C. Allow solids accumulation on the bottom of the lagoon to dry. After drying the solids should be mixed with soil and left on the bottom of the lagoon at a one to one 1:1 ratio. Berm material if available, may be used for mixing and filling. The balance of any remaining material shall be provided by the contractor from an off-site borrow area. *A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary.*

D. The outfall pipe is to be removed three feet back into the ground and plugged with a non-shrinking grout. Any disturbed creek or riverbanks are to be stabilized and restored.

E. All portions of any other metal or cement structures associated with the lagoon and to be abandoned are to be "pushed in" such that no part of the structure is within 2 feet of the final top ground level. **NO RUBBLE EXCEPT WHAT RESULTS FROM THE DEMOLITION OF THIS FACILITY IS TO BE PLACED IN THE EMPTY STRUCTURES.**

F. Any structure inlet or outlet lines which will not be removed as a result of the demolition must be plugged with a non-shrinking grout. *All wastewater shall be drained from the piping and disposed of in an approved manner prior to placement of grout plugs.*

G. Final grading is to match existing contours. In no case should grades be less than 1% nor greater than 10%.

H. Erosion control methods shall be established to keep silt on site. Disturbed areas shall be properly stabilized and vegetated. The area is to be covered with suitable quality dirt to establish a groundcover to prevent erosion. The groundcover must be of a type that will establish quickly and continue to maintain a suitable cover with minimal to no additional care after establishment. Disturbed areas will be considered stabilized when perennial vegetation, pavement or structures using permanent materials cover all areas that have been disturbed. Interim diversion ditches, swales, or other devices may be required to divert off site water from the project area.

I. Fences, posts and appurtenances must be removed as shown on the plan.

J. Contractor to make all effort not to disturb or damage existing lift station at the site.

*Contractor shall be responsible for disposal of all material unless otherwise stated.*

*Contractor shall be responsible for any additional fill to be provided from an off-site borrow area, as needed.*

## **6. Spring Lake Estates Lagoon – Drawing C13**

A. Remove the wastewater from the existing cell(s). The wastewater should be pumped to the district's wastewater collection system.

B. Remove all mechanical equipment, piping, valves, and liner materials (e.g., plastic and clay liners) and dispose of in an approved manner. Other above ground utilities, if any, must be removed and properly terminated.

C. Allow solids accumulation on the bottom of the lagoon to dry. After drying the solids should be mixed with soil and left on the bottom of the lagoon at a one to one 1:1 ratio. Berm material if available, may be used for mixing and filling. The balance of any remaining material shall be provided by the contractor from an off-site borrow area. *A disinfectant suitable for control of odors and vectors shall be applied to all remaining solids when necessary.*

D. Remove the outfall structure and if appropriate, it can be placed in one of the cells for disposal. The outfall pipe is to be removed three feet back into the ground and plugged with a non-shrinking grout. Any disturbed creek or riverbanks are to be restored.

E. All portions of any other metal or cement structures associated with the lagoon and to be abandoned are to be "pushed in" such that no part of the structure is within 2 feet of the final top ground level. **NO RUBBLE EXCEPT WHAT RESULTS FROM THE DEMOLITION OF THIS FACILITY IS TO BE PLACED IN THE EMPTY STRUCTURES.**

F. Any structure inlet or outlet lines which will not be removed as a result of the demolition must be plugged with a non-shrinking grout. *All wastewater shall be drained from the piping and disposed of in an approved manner prior to placement of grout plugs.*

G. Final grading is to match existing contours. In no case should grades be less than 1% nor greater than 10%.

H. Erosion control methods shall be established to keep silt on site. Disturbed areas shall be properly stabilized and vegetated. The area is to be covered with suitable quality dirt to establish a groundcover to prevent erosion. The groundcover must be of a type that will establish quickly and continue to maintain a suitable cover with minimal to no additional care after establishment. Disturbed areas will be considered stabilized when perennial vegetation, pavement or structures using permanent materials cover all areas that have been disturbed. Interim diversion ditches, swales, or other devices may be required to divert off site water from the project area.

I. Fences, posts and appurtenances must be removed as shown on the plan.

J. Contractor to make all effort not to disturb or damage water main or valve at east side the site.

*Contractor shall be responsible for disposal of all material unless otherwise stated.*

*Contractor shall be responsible for any additional fill to be provided from an off-site borrow area, as needed.*

### **PART 1 – GENERAL**

- 1.1 Scope. The work covered by this section consists of furnishing all labor, equipment, and materials and performing all operations, in connection with constructing measures to prevent erosion damage on the project site and adjacent properties.

### **PART 2 – MATERIALS & PRODUCTS**

- 2.1 General Requirements. Contractor shall prevent erosion of soil on the site and adjacent properties resulting from construction activities. Effective measures shall be completed in-place prior to the commencement of clearing, grading, excavation, or any other operation that may disturb the natural flow.

Work shall be scheduled to expose areas subject to erosion for the shortest period of time possible, and natural vegetation preserved to the greatest extent practicable. Temporary storage and construction buildings, if any, shall be located, and construction traffic routed, to minimize erosion. Temporary, fast-growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

Erosion control measures consisting of, but not limited to, tree preservation and protection, temporary gravel construction entrance, permanent seeding and sodding, riprap and other channel protection, temporary slope drains, paved flumes, outlet stabilization structures, fabric filter silt fences, temporary straw bales, and temporary sediment traps shall be used as necessary to control runoff and erosion. In addition, reseeded to establish permanent protection shall be done as soon as possible

The Contractor may also be required to provide additional erosion control at the site as directed by the City, State or Federal regulatory agency. This additional erosion control work shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be the responsibility of the Contractor.

At the completion of the Work, or at such time as the Engineer determines that adequate permanent erosion control measures have been established, the Contractor shall remove the temporary erosion control measures and properly dispose of at the Contractor's expense.

Erosion control will be a condition for recommendation of progress payment applications.

### **PART 3 – EXECUTION**

- 3.1 Tree Preservation and Protection. Contractor shall implement appropriate measures to ensure proper protection of existing trees from damage due to construction activities. Unless otherwise directed by the Engineer, all trees within or near the project limits that are not designated to be removed on the construction drawings shall be afforded protection. The Engineer reserves the right to change the protection status due to tree health, aesthetics, or other factors, and mark the tree for removal by the Contractor. This shall be considered subsidiary to the clearing, grubbing, and demolition work.
- 3.2 Temporary Gravel Construction Entrance. Contractor shall construct temporary construction entrances from the project site to public roads as required to reduce the transport of mud onto the roadway from both vehicular traffic and runoff. Construction of the entrances shall conform to the details shown on the drawings.
- 3.3 Permanent Seeding and Sodding. Contractor shall use proper seeding and sodding techniques on areas noted on the construction drawings, and all other area disturbed by construction activity, to permanently stabilize graded areas against the effects of erosion. Section 02920 for proper materials and procedures.
- 3.4 Riprap and Channel Protection. Contractor shall construct riprap outlet and channel protection as indicated on the drawings, and other areas as required, to minimize erosion of the drainage channels. Materials and methods of construction shall conform to Section 02373.

- 3.5 Temporary Slope Drains. Contractor may employ the use of temporary slope drains to convey concentrated water flows down cut or fill slopes while minimizing erosion. Contractor shall ensure that the structures are properly sized, constructed, and maintained. Construction of the slope drains shall conform to the details shown on the standard drawings.
- 3.6 Paved Flumes. Contractor shall construct paved flumes as indicated on the drawings, and other areas as required, to convey concentrated runoff down relatively flat slopes. Construction of the flumes shall conform to the details shown on the plans.
- 3.7 Outlet Stabilization Structures. Outlet stabilization structures (riprap aprons) are used to reduce energy levels of discharged flows to acceptable levels for the existing downstream conditions. Contractor shall construct outlet stabilization structures where required for the other erosion control measures employed by the Contractor. Contractor shall ensure that all stabilization structures are properly sized and constructed to minimize erosion effects in the downstream channels. Construction shall conform to the details shown on the standard drawings.
- 3.8 Fabric Filter Silt Fences. Contractor may erect fabric filter silt fences as required to control erosion from sheet flow condition runoff. Silt fences should only be constructed where ponding behind the fence will not cause damage. Silt fences are to be constructed and maintained in conformance with the details shown on the standard drawings.
- 3.9 Temporary Straw Bales. Contractor may install straw bales as temporary erosion control devices for small watersheds. Straw bales should be located to intercept sheet flow. Construction of the straw bales shall conform to the details shown on the standard drawings.
- 3.10 Temporary Sediment Trap. Contractor shall construct temporary sediment traps to trap and retain sediment picked up by storm runoff on the site as indicated on the drawings. Contractor shall maintain the trap by removing sediment as required to maintain the necessary capacity. Construction shall conform to the details shown on the standard drawings.
- 3.11 Rock Ditch Check. Contractor shall construct rock ditch checks as indicated on drawings to limit the velocity of runoff in ditches. Construction shall conform to the details indicated on the standard drawings.
- 3.12 Silt Fence. Contractor shall construct, install and maintain silt fences as indicated on the drawings, to limit the transport of sediment from disturbed roadway construction. Construction and maintenance shall conform to the details shown on the standard drawings.
- 3.13 Temporary Pipe. Contractor shall install temporary pipes as indicated on the drawings, to direct the concentrated runoff under roadways. Selection of pipe material and size shall be made by the Contractor according to the cover available and the area to be drained.
- 3.14 Temporary Berm. Contractor shall construct temporary berms as indicated on the drawings, to limit the transport of sediment from disturbed roadway construction areas. Construction and maintenance shall conform to the details indicated on the standard drawings.
- 3.15 Sediment Basin. Contractor shall construct, install and maintain sedimentation basins indicated on the drawings. Construction and maintenance shall conform to the details indicated on the standard drawings.

#### **PART 4 - PAYMENT**

- 4.1 Payment. Any work items called out or that are otherwise necessary for a complete and working project that are not listed in the Bid Form are to be considered subsidiary and no direct payment will be made.

END OF SECTION 02210

## **PART 1 – GENERAL**

- 1.1 This section includes the following:
- A. Protection of existing trees indicated to remain.
  - B. Removal of trees and other vegetation.
  - C. Topsoil stripping.
  - D. Clearing and grubbing.
  - E. Removing above-grade improvements.
  - F. Removing below-grade improvements.
- 1.2 Project Conditions.
- A. Traffic: Conduct site-clearing operations to ensure minimum interference with roads, streets, walks, driveways, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
  - B. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements indicated to remain in place.
    - 1. Protect improvements on adjoining properties and on easements.
    - 2. Restore damaged improvements to their original condition, as acceptable to property owners.
  - C. Protection of Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.
  - D. Salvable Improvements: Carefully remove items indicated to be salvaged and delivered to the location to be specified by the Owner.
- 1.3 Existing Services.
- A. General: Indicated locations are approximate; determine exact locations before commencing Work.
  - B. Arrange and pay for disconnecting, removing, capping, and plugging utility services. Notify affected utility companies in advance and obtain approval before starting this Work.
  - C. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

## **PART 2 – PRODUCTS – (Not Applicable)**

## **PART 3 – EXECUTION**

- 3.1 Site Clearing.
- A. General: Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
    - 1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.

- B. Topsoil: Topsoil is defined as friable clay loam surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay, lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
    - 1. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping.
      - a. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
    - 2. Stockpile topsoil in storage piles in areas approved by Engineer. Construct storage piles to provide free drainage of surface water.
    - 3. Dispose of unsuitable or excess topsoil as specified for disposal of waste material.
  - C. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated to be left standing.
    - 1. Completely remove stumps, roots, and other debris protruding through ground surface.
    - 2. Use only hand methods for grubbing inside drip line of trees indicated to remain.
    - 3. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
      - a. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact each layer to a density equal to adjacent original ground.
  - D. Removal of Improvements: Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction.
    - 1. In removing concrete pavement, concrete base courses, curb and gutter sections, driveways, and sidewalks, for construction of improvements, they shall be removed to an existing joint unless otherwise approved by the Engineer. Saw cutting the full depth of existing pavements shall be used to insure the breakage of pavement along straight lines. Sufficient removal shall be made to provide for proper grades and connections in the new work.
    - 2. Abandonment or removal of certain underground pipe or conduits may be indicated on drawings and is included under work of related Section 02630. Removing abandoned underground piping or conduits interfering with construction is included under this Section.
- 3.2 Disposal of Waste Materials.
- A. All concrete pavement, concrete base courses, curb and gutter sections, and driveways within the limits of construction, shall be removed and disposed of by the Contractor as required.
  - B. Burning: Burning will be allowed at approved locations pending the Contractor acquiring the required permits from appropriate local agency having jurisdiction and approval from the Owner. Provide full-time monitoring for burning materials until fires are extinguished.
  - C. Removal from Owner's Property: Remove waste materials and unsuitable or excess topsoil from work areas which include but are not limited to easements, rights-of-way, adjacent property, and Owner's property.

END OF SECTION 02230

## **PART 1 – GENERAL**

### 1.1 Summary.

- A. This section includes the following:
  - 1. Removal of lagoon embankment and liner.
  - 2. Excavating and backfilling for manholes, and underground utilities and appurtenances.

### 1.2 Definitions.

- A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, or topsoil materials.
- C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- D. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.
- E. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- F. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines and overhead wires.

## **PART 2 – PRODUCTS**

### 2.1 Soil Materials.

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
- B. Satisfactory Soil Materials for Lagoon Embankment: Unified soil classification groups GW, GM, SW, SM, GC, SC, ML, and CL; free of rock and gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
- C. Satisfactory Soil Materials for Lagoon Liner: Unified soil classification groups CL, CH, GC, or SC; free of rock and gravel, debris, waste, frozen materials, vegetation and other deleterious matter. These materials must have a plasticity index greater than 20 (ASTM D4318), a liquid limit greater than 30 (ASTM D4318), allow more than 50% passage through a No. 200 sieve, and have a coefficient of permeability equal to or less than  $1 \times 10^{-7}$  cm per second when compacted to 90% of standard proctor with the moisture content between 2% below and 4% above the optimum moisture content.
- D. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GP, SP, MH, CH, OL, OH, and PT.
- E. Backfill and Fill Materials: Satisfactory soil materials.
- F. Topsoil: Topsoil shall consist of friable surface soil reasonably free of grass, roots, weeds, stones, or other foreign material.

## **PART 3 – EXECUTION**

### 3.1 Preparation.

- A. 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. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
  - C. 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.
- 3.2 Topsoil.
- A. Topsoil shall be removed before commencing excavation and embankment. A quantity of topsoil sufficient to cover areas to be turfed to a minimum depth of 6 inches shall be stockpiled. Objectional and foreign materials shall be removed before placing topsoil in stock pile. Prior to spreading, scarify subgrade to a depth of 6 inches. Spreading shall not be done when subgrade or topsoil is froze, excessively wet or dry, or otherwise in a condition unsuitable for working.
- 3.3 Dewatering.
- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
  - B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- 3.4 Excavation.
- A. Explosives: Do not use explosives.
  - B. Excavation: Excavation is unclassified and includes excavation to required subgrade elevations. Excavation will be classified as earth excavation or rock excavation as follows:
    - 1. Earth excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with soil and other materials encountered that are not classified as rock or unauthorized excavation.
    - 2. Rock excavation includes removal and disposal of boulders 1 cu. yd. or more in volume and rock in beds, ledges, unstratified masses, and conglomerate deposits that cannot be removed without systematic drilling, blasting, or ripping.
      - a. Excavations more than 10 feet in width and pits more than 30 feet in either length or width are defined as open excavations.
      - b. Rock excavation will be paid by unit prices included in the Contract Documents.
      - c. Do not excavate rock until it has been classified and cross-sectioned by Engineer.
- 3.5 Stability of Excavations.
- A. Comply with local and federal (OSHA) codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.
- 3.6 Excavation for structures.
- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. Extend excavations a sufficient distance from structures to allow placing and removing concrete formwork, installing services and other construction, and for inspections.
    - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
    - 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Appurtenances: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb bottom of excavations intended for bearing surface.
- 3.7 Excavation for utility trenches.



- A. Excavate trenches to indicated slopes, lines, depths, and invert elevations. Requirements for utility trench excavation are outlined in Section 02317, Utility Trench Excavation and Backfill.
- 3.8 Approval of subgrade.
- A. Notify Engineer when excavations have reached required subgrade.
  - B. When Engineer determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
    - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
  - C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Engineer.
- 3.9 Unauthorized excavation.
- A. Fill unauthorized excavation under foundations by extending indicated bottom elevation of concrete foundation to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Engineer.
    - 1. Fill unauthorized excavations under other construction as directed by the Engineer.
  - B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Engineer.
- 3.10 Storage of soil materials.
- A. Stockpile excavated materials acceptable for backfill and fill soil materials including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
    - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
    - 2. All permanent or temporarily stored excavated materials shall be protected from erosion and adjacent properties shall be protected from sedimentation.
- 3.11 Backfill.
- A. Backfill excavations promptly, but not before completing the following:
    - 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
    - 2. Inspection of subgrades.
    - 3. Surveying locations of underground utilities for record documents.
    - 4. Testing, inspecting, and approval of underground utilities.
    - 5. Concrete formwork removal.
    - 6. Removal of trash and debris from excavation.
    - 7. Removal of temporary shoring and bracing, and sheeting.
- 3.12 Preparation.
- A. Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, and deleterious materials from ground surface prior to placing fills. The topsoil should be stockpiled for use in landscaping. The other materials should be disposed of off-site.
    - 1. Prior to performing the required final grading operations, the exposed subgrade shall be proof-rolled and inspected for pockets of excessively wet, soft, highly plastic or disturbed

soils. Any such unsuitable soils shall be removed and replaced with properly compacted fill material to a depth of at least 8 inches.

2. When embankment is to be placed on hillsides or when new embankment is to be constructed against existing embankments, the existing slopes that are steeper than 6 horizontal to 1 vertical when measured at right angle to the roadway shall be continuously benched in not less than 12-inch rises over those areas where it is required as the work is brought up in layers. Benching shall be of sufficient width to permit placing and compacting operation. Each horizontal cut shall begin at the intersection of the ground line and the vertical side of the previous bench. Existing slopes shall also be stepped to prevent any wedging action of the embankment against structures. No direct payment will be made for the material thus cut out, nor for its compaction along with the new embankment material.
  - B. Prior to placing fill in any area, the subgrade shall be scarified to a depth of at least 8 inches or as designated by the Engineer, the moisture content of the soil adjusted to 2% below to 4% above optimum moisture content, and the subgrade properly compacted to at least 90% maximum dry density. Following satisfactory compaction of the subgrade, controlled compacted suitable fill material shall be placed in 8-inch lifts to bring the embankment to the required grades.
  - C. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.
- 3.13 Moisture control.
- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2% below and 4% above optimum moisture content.
    1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
    2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.
- 3.14 Compaction.
- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment.
- 3.15 Grading
- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
    1. Provide a smooth transition between existing adjacent grades and new grades.
    2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
  - B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within plus or minus 0.10 foot.
- 3.16 Protection
- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
  - B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace material to depth directed by the Engineer; reshape and recompact at optimum moisture content to the required density.
  - C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
    1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.
- 3.17 Disposal of surplus and waste materials.
- A. Surplus: Spread and grade surplus soil material at location as designated on the Owner's property.
  - B. Waste: Remove waste material, including trash and debris, and legally dispose of it off the Owner's property.

END OF SECTION 02300

### PART 1 – GENERAL

- 1.1 Scope. The work covered by this section consists of furnishing all labor, equipment, and materials and performing all operations, in connection with establishing grass on areas disturbed by the Contractor's operations. Seeding will not be required in areas being used for the production of crops.

### PART 2 – MATERIALS & PRODUCTS

- 2.1 Fertilizer. Fertilizer shall be pelleted or granulated, free flowing, and shall have an analysis of equal parts of available nitrogen, phosphorus, and potassium, such as 10-10-10 or 12-12-12.
- 2.2 Seed. Missouri Certified seed, tested and tagged, shall be used in accordance with Missouri Seed Improvement Association. Seed shall be furnished in sealed, standard containers. Seed that is wet or moldy or that has been otherwise damaged in transport or storage will not be acceptable. Seed mixtures shall conform to the following, except as otherwise noted on the plans or project specifications.
- A. Lawn Area Seed Mix: Seed shall be a blend of 90% turf type fescue mixed with 10% perennial ryegrass applied at a rate of **8 pounds per 1,000 square feet**. Turf type fescue cultivars shall be equal parts of three of the following improved varieties: Tempo, Falcon, Olympic, Rebel, Rebel II, Bonanza, Adventure, Mustang, Arid, Apache, Jaguar, Wrangler, and Cimaron. The 10% perennial ryegrass shall be one of the following varieties: Citation II, Palmer, Fiesta, Manhattan II, Ranger, Prelude, Diplomat, Pennant, or Blazer.
- B. Field Area Seed Mix: Seed shall be a blend of 80% Kentucky 31 tall fescue mixed with 10% annual ryegrass and 10% perennial ryegrass applied at a rate of **100 pounds per acre**.
- 2.3 Sod. Certified turf grass sod conforming to the American Sod Producers Association specifications for machine-cut thickness, size, strength, moisture content, and mowed height shall be used. Sod shall be free of weeds and undesirable native grasses and of uniform density, color, and texture. Unless another species is specified on the plans or project specifications, sod shall be a turf type fescue cultivar blend with a minimum of three of the following improved varieties: Tempo, Falcon, Olympic, Rebel, Rebel II, Bonanza, Adventure, and Mustang.
- 2.4 Mulch. Mulch for application to seed areas shall be straw or hay baled, dry, unweathered, and shall show no signs of discoloration and mold damage. Material containing excessive amounts of weed or crop seeds will not be acceptable. Mulch shall be applied at a rate of **100 standard bales per acre** and crimped in loose surface soil on slopes greater than 3:1.
- 2.5 Erosion Control Blankets. Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable or UV stabilized plastic mesh shall be installed at locations shown on the plans according to the manufacturer's recommendations.
- A. The straw/coconut-fiber erosion control blanket shall be SC150 as manufactured by North American Green, or equivalent. The blanket shall be a machine-produced mat of 70% agricultural straw and 30% coconut fibers.

### PART 3 – EXECUTION

- 3.1 Soil Preparation. Contractor shall limit soil preparation to areas that will be planted in the immediate future. Areas to be prepared shall have the soil loosed to a minimum depth of 4 inches. Stones larger than 1½" for lawn areas and 4" for field areas shall be removed. Areas shall be graded to a smooth, even surface with loose, uniformly fine texture. Soil shall be rolled and raked to remove ridges and fill depressions to meet finish grades. Trash, debris, and other objects that may interfere with planting or maintenance operations shall be removed.
- 3.2 Seeding. Seed shall be sowed with a spreader or seeding machine at the rates specified. Seed shall be evenly distributed by sowing equal quantities in 2 directions at right angles to each other. Seed in lawn areas shall be raked slightly into the top 1/8 inch of topsoil, rolled lightly, and watered.

- 3.3 Mulching. Mulch shall be spread uniformly in a continuous blanket according to the specified rates. Mulch shall be spread by hand, blower, or other suitable equipment.
- 3.4 Sodding. All sod used shall be the same type as removed or damaged, shall be best quality, and, when placed, shall be live fresh growing grass with at least 1-1/2 inches of soil adhering to the roots. All sod shall be procured from areas where soil is fertile and contains a high percentage of loamy topsoil and from areas that have been grazed or mowed sufficiently to form a dense turf.
- Sod shall be transplanted within 24 hours from the time it is harvested, unless stacked at its destination in a suitable manner. All sod in stacks shall be kept moist and protected from exposure to the sun and from freezing. In no event shall more than one week elapse between cutting and planting.
- Before placing sod, all shaping and dressing of the areas shall have been completed. After shaping and dressing, fertilizer, as specified, shall be applied uniformly in the manner and amounts recommended by the manufacturer, and harrowed lightly. Sodding shall follow immediately. All sodding shall be done during the period from March 15 to October 1, unless written permission is given by the Engineer to extend the planting season.
- 3.5 Maintenance. Contractor shall maintain all areas until final acceptance of the project. Maintenance shall include repair of erosion damage, reseeding, maintenance of mulch, mowing, and watering.

**PART 4 – PAYMENT**

- 4.1 Any work items called out or that are otherwise necessary for a complete and working project that are not listed in the Bid Form are to be considered subsidiary and no direct payment will be.

END OF SECTION 02920