

Indian Creek Water Quality Improvements

Marion, Iowa

Issued: November 14, 2022



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0100 NOTICE TO BIDDERS INDIAN CREEK WATER QUALITY IMPROVEMENTS

Sealed bids for the work comprising each improvement as stated below must be filed before 1:00 P.M. according to the clock at the office of the Cedar Rapids Linn County Solid Waste Agency on **Tuesday December 8th** in the **Administration Building**, **1954 County Home Road**, **Marion**, **Iowa 52302**. Bids received after the deadline for submission of bids as stated herein shall not be considered and shall be returned to the late bidder unopened.

Sealed proposals will be publicly opened immediately thereafter in the Administration Building, 1954 County Home Road, Marion, Iowa for consideration by the Cedar Rapids Linn County Solid Waste Agency Board of Directors at its meeting on Tuesday December 20th at 1:30 P.M.

This project includes construction of a wetland area to be used as a runoff buffer between farmland and Indian Creek located in Marion Township, Linn County, Iowa. This project also includes the construction of a bioreactor to assist with nutrient reduction from subsurface farm tile.

All improvements shall be completed in accordance with the contract documents, including the plans, specifications, and contract, prepared by the United States Department of Agriculture (Natural Resources Conservation Service) and HDR Engineering Inc. Contractor shall fully complete the project in accordance with the schedule below. Should the contractor fail to complete the improvements in this timeframe, liquidated damages of **\$500.00** per calendar day will be assessed for work not completed within the designated contract term.

Specified Start Date: April 3, 2023 Final Completion Date: July 1, 2023

A copy of the contract documents is available for review by any interested person at the Administration Building, 1954 County Home Road, Marion, Iowa 52302. Copies of the contract documents will be available on **Monday November 14th** from Rapids Reproductions, 6015 Huntington Ct NE, Cedar Rapids, IA 52402; (319) 364-2473; www.rapidsrepro.com.

In accordance with lowa statutes, a resident bidder shall be allowed a preference as against a nonresident bidder from a state or foreign country if that state or foreign country gives or requires any preference to bidders from that state or foreign country, including but not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country. The preference allowed shall be equal to the preference given or required by the state or foreign country in which the nonresident bidder is a resident. In the instance of a resident labor force preference, a nonresident bidder shall apply the same resident labor force preference to a public improvement in this state as would be required in the construction of a public improvement by the state or foreign country in which the nonresident bidder is a resident.

Each proposal shall be completed on the form included with the contract documents and must be submitted in a sealed envelope. In a separate sealed envelope attached to the outside of the bid proposal envelope, each bidder shall accompany its bid with bid security as defined in Iowa Code Section 26.8, as security that the successful bidder will enter into a contract for the work bid upon and will furnish after the award of contract a corporate surety bond, in a form acceptable to the Cedar Rapids Linn County Solid Waste Agency, for the faithful performance of the contract, in an amount equal to 100% of the amount of the contract. The bidder's security shall be in the amount fixed in the Instruction to Bidders and shall be in the form of a cashier's check or a certified check drawn on an FDIC insured bank in Iowa or on an FDIC insured bank chartered under the laws of the United States; or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States; or a bid bond on the form provided in the contract documents with corporate surety satisfactory to the Owner. The bid shall contain no condition except as provided in the specifications.

The Cedar Rapids Linn County Solid Waste Agency reserves the right to defer acceptance of any bid for a period of sixty (60) calendar days after receipt of bids and no bid may be withdrawn during this period.

Each successful bidder will be required to furnish a corporate surety bond (Performance, Payment, and Maintenance Bond) in an amount equal to 100% of its contract price. Said bond shall be issued by a responsible surety approved by Cedar Rapids Linn County Solid Waste Agency and shall guarantee the faithful performance of the contract and the terms and conditions therein contained and shall guarantee the prompt payment of all material and labor, and protect and save harmless Cedar Rapids Linn County Solid Waste Agency from claims and damages of any kind caused by the operations of the contract and shall also guarantee the maintenance of the improvement caused by failures in materials and construction for a period of **two (2) years** from and after acceptance of the improvement.

The Cedar Rapids Linn County Solid Waste Agency, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42U.S.C. 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

The Cedar Rapids Linn County Solid Waste Agency does hereby reserve the right to reject any or all bids, to waive informalities, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the Owner.

Prospective bidders may contact Garrett Prestegard by phone at (319) 377-5290 or email at <u>gprestegard@solidwasteagency.com</u> to arrange a site visit.

This notice is given by authority of the Cedar Rapids Linn County Solid Waste Agency Board of Directors.

0200 INSTRUCTIONS TO BIDDERS INDIAN CREEK WATER QUALITY IMPROVEMENTS

The work comprising the above referenced project improvements shall be constructed in accordance with the 2022 edition of the Iowa Statewide Urban Design and Specifications (SUDAS) Standard Specifications and as further modified by the Natural Resources Conservation Service (NRCS) Construction Specifications, supplemental specifications, and special provisions.

The terms used in the contract documents are defined in said Standard Specifications. **Before submitting** your bid, review the requirements of Division 1, General Provisions and Covenants, in particular the sections regarding proposal requirements, bonding, contract execution and insurance requirements. Be certain that all documents have been completed properly, as failure to complete and sign all documents and to comply with the requirements listed below can cause your bid not to be read.

I. BID SECURITY

- A. The bid security must be in the amount of **5%** of the total bid amount including all add alternates (do not deduct the amount of deduct alternates).
- B. Bid security shall be in the form of a cashier's check or a certified check, drawn on an FDIC insured bank in Iowa or drawn on an FDIC insured bank chartered under the laws of the United States; or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States; or a bid bond executed by a corporation authorized to contract as a surety in Iowa or satisfactory to the Owner. The bid bond must be submitted on the enclosed Bid Bond form as no other bid bond forms are acceptable. All signatures on the bid bond must be original signatures in ink; facsimile (fax) of any signature or use of an electronic signature on the bid bond is not acceptable. Bid security other than said bid bond shall be made payable to Cedar Rapids Linn County Solid Waste Agency. "Miscellaneous Bank Checks," and personal checks, as well as "Money Orders" and "Traveler's Checks" issued by persons, firms, or corporations licensed under Chapter 533C of the Iowa Code, are not acceptable bid security.

II. SUBMISSION OF THE PROPOSAL AND IDENTITY OF BIDDER

- A. See Section 1020 of the SUDAS Standard Specifications (found at <u>https://intrans.iastate.edu/app/uploads/sites/15/2020/02/1020.pdfhttps://intrans.iastate.edu/app/uploads/sites/15/2020/02/1020.pdf</u>) for complete descriptions of the proposal requirements and conditions.
- B. Submittals include two separate sealed envelopes: Envelope 1: Bid Security and Bidder Status Form Envelope 2: Proposal
- C. The following documents shall be completed, signed, and returned in the Proposal envelope. The signature on the proposal and all proposal attachments must be an original signature in ink signed by the same individual who is the Company Owner or an authorized Officer of the Company; copies or facsimile of any signature or electronic signatures will not be accepted. The bid cannot be read if any of these documents are omitted from the Proposal envelope.
 - 1) Part B Acknowledgment of Addenda if any have been issued
 - 2) Part C Bid Items, Quantities, and Prices

- 3) Part G Identity of Bidder (including the Bidder Status Form)
 - i. The Bidder Status Form is required by the Iowa Labor Commissioner, pursuant to the Iowa Administrative Code rule 875-156.2(1). The Bidder must complete and submit the Bidder Status Form, signed by an authorized representative of the Bidder, with their bid proposal. Under Iowa Administrative Code rule 875-156.2(1), failure to provide the Bidder Status Form with the bid may result in the bid being deemed non-responsive and may result in the bid being rejected. The Worksheet: Authorized to Transact Business from the Labor Commissioner is included on the following page and can be used to assist Bidders in completing the Bidder Status Form.

III. PERFORMANCE, PAYMENT, AND MAINTENANCE BOND

- A. The successful bidder will be required to furnish a bond in an amount equal to one hundred percent (100%) of the contract price for a period of **two (2) years** after its completion.
- B. Use the Performance, Payment, and Maintenance Bond Form included in the bidding documents.
- C. See Section 1070 of the SUDAS Standard Specifications (found at https://intrans.iastate.edu/app/uploads/sites/15/2020/02/1070.pdfhttps://intrans.iastate.edu/ app/uploads/sites/15/2020/02/1020.pdf) for complete descriptions of the bonding requirements and conditions.

IV. INSURANCE REQUIREMENTS

A. See Section 1070 of the SUDAS Standard Specifications (found at <u>https://intrans.iastate.edu/app/uploads/sites/15/2020/02/1070.pdfhttps://intrans.iastate.edu/app/uploads/sites/15/2020/02/1020.pdf</u>) for complete descriptions of the insurance requirements and conditions.

WORKSHEET: AUTHORIZATION TO TRANSACT BUSINESS

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

□ Yes	□ No	My business is currently registered as a contractor with the Iowa Division of Labor.
□ Yes	□ No	My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
□ Yes	□ No	My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
□ Yes	□ No	My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
□ Yes	□ No	My business is a corporation whose articles of incorporation are filed in a state other than lowa, the corporation has received a certificate of authority from the lowa Secretary of State, has filed its most recent biennial report with the Secretary of State, and has neither received a certificate of withdrawal from the Secretary of state nor had its authority revoked.
□ Yes	□ No	My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
□ Yes	□ No	My business is a limited liability partnership which has filed a statement of qualification in a state other than lowa, has filed a statement of foreign qualification in lowa and a statement of cancellation has not been filed.
□ Yes	□ No	My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.
□ Yes	□ No	My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa Secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited partnership.
□ Yes	□ No	My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
□ Yes	□ No	My business is a limited liability company whose certificate of organization is filed in a state other than lowa, has received a certificate of authority to transact business in lowa and the certificate has not been revoked or canceled.

0300 PROPOSAL INDIAN CREEK WATER QUALITY IMPROVEMENTS

PART A – SCOPE

The **Cedar Rapids Linn County Solid Waste Agency**, hereinafter called the "Owner," has need of a qualified contractor to complete the work comprising the below referenced improvement. The undersigned Bidder hereby proposes to complete the work comprising the below referenced improvement as specified in the contract documents, which are officially on file with the Owner, in the office of the **Cedar Rapids Linn County Solid Waste Agency**, at the prices hereinafter provided in Part C of the Proposal, for the following described improvements:

PART B – ACKNOWLEDGMENT OF ADDENDA

The Bidder hereby acknowledges that all addenda become a part of the contract documents when issued, and that each such addendum has been received and utilized in the preparation of this bid. The Bidder hereby acknowledges receipt of the following addenda ______, ____, ____, ____, and certifies that said addenda were utilized in the preparation of this bid.

PART C – BID ITEMS, QUANTITIES, AND PRICES

The Bidder must provide the Unit Bid Price, the Total Bid Price, any Alternate Prices, and the Total Construction Costs on the Proposal. In case of discrepancy, the Unit Bid Price governs. The quantities shown below are approximate only but are considered sufficiently adequate for the purpose of comparing bids. The Total Construction Cost plus any alternates selected by the Owner, shall be used only for comparison of bids. The Total Construction Cost, including any Add-Alternates, shall be used for determining the sufficiency of the bid security.

ITEM	SUDAS No.	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
1	0000-CR-A	Dike with Shallow Water Excavation Treating Day-Lighted Tile	LS	1	\$	\$
2	0000-CR-B	Denitrifying Bioreactor	LS	1	\$	\$
3	4030-A-1	Pipe Culvert, Trenched, RCP Class V, 24"	LF	75	\$	\$
4	4030-B	Pipe Apron, RCP Class V, 24"	EA	2	\$	\$
5	4030-C	Footing for Concrete Pipe Apron	EA	2	\$	\$
6	9040-A-2	SWPPP Management	LS	1	\$	\$
7	11,010-В	Construction Survey	LS	1	\$	\$
8	11,020-A	Mobilization	LS	1	\$	\$

TOTAL EXTENDED AMOUNT \$

PART D – GENERAL

The Bidder hereby acknowledges that the Owner, in advertising for public bids for this project, reserves the right to reject any or all bids. Award of the contract, if any, to be to the lowest responsible, responsive bidder; and make such alterations in the contract documents or in the proposal quantities as it determines necessary in accordance with the contract documents after execution of the contract. Such alterations shall not be considered a waiver of any conditions of the contract documents, and shall not invalidate any of the provisions thereof; and

The Bidder hereby agrees to:

- 1. Enter into a contract, if this proposal is selected, in the form approved by the Owner, provide proof of registration with the Iowa Division of Labor in accordance with Chapter 91C of the Iowa Code, and furnish a performance, maintenance, and payment bond; and
- 2. Forfeit bid security, not as a penalty but as liquidated damages, upon failure to enter into such contract and/or to furnish said bond; and
- 3. Commence the work on this project on or before a date to be specified in a written notice to proceed by the Owner, and to fully complete the **Indian Creek Water Quality Improvements** by July 1, 2023; and to pay liquidated damages for noncompliance with said completion provisions at the rate of **five hundred dollars (\$500.00)** for each calendar day thereafter that the work remains incomplete.

PART E – NON-COLLUSION AFFIDAVIT

The Bidder hereby certifies:

- 1. That this proposal is not affected by, contingent on, or dependent on any other proposal submitted for any improvement with the Owner; and
- 2. That no individual employed by the Bidder has employed any person to solicit or procure the work on this project, nor will any employee of the Bidder make any payment or agreement for payment of any compensation in connection with the procurement of this project; and
- 3. That no part of the bid price received by the Bidder was or will be paid to any person, corporation, firm, association, or other organization for soliciting the bid, other than the payment of their normal compensation to persons regularly employed by the Bidder whose services in connection with the construction of the project were in the regular course of their duties for the Bidder; and
- 4. That this proposal is genuine and not collusive or sham; that the Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to submit a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought, by agreement or collusion, or communication or conference, with any person, to fix the bid price of the Bidder or of any other bidder, and that all statements in this proposal are true; and
- 5. That the individual(s) executing this proposal have the authority to execute this proposal on behalf of the Bidder.

PART G – IDENTITY OF BIDDER

The Bidder shall indicate whether the bid is submitted by a/an:

	Individual, Sole Proprietorship		
	Partnership		Bidder
	Corporation		Signature
	Limited Liability Company	Ву	Nome (Drint/Type)
	Joint-venture: all parties must join-in and execute all documents		Name (Finit Type)
	Other		Title
The E	Bidder shall enter its Public Registration		Street Address
By th Secti	e Iowa Commissioner of Labor Pursuant on 91C.5 of the Iowa Code.		City, State, Zip Code
			Telephone Number
			Type or print the name and title of the company's owner, president, CEO, etc. if a different person than entered above
Failu shall	re to provide said Registration Number result in the bid being read under		
advis until 1	ement. A contract will not be executed he Contractor is registered.		Name
			Title

NOTE: The signature on this proposal must be an original signature in ink; copies, facsimiles, or electronic signatures will not be accepted.

BIDDER STATUS FORM

TO BE COMPLETED BY ALL BIDDERS

PART A

Please answer "Yes" or "No" for each of the following:

□ Yes	□ No	My company is authorized to transact business in Iowa. (To help you determine if your company is authorized, please review the worksheet on the next page).
□ Yes	□ No	My company has an office to transact business in Iowa.
□ Yes	□ No	My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
□ Yes	□ No	My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
□ Yes	□ No	My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.
		If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.
		If you answered "No" to one or more questions above, your company is a non-resident bidder. Please complete Parts C and D of this form.

TO BE COMPLETED BY RESIDENT BIDDERS

PART B

Part C

Part D

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates:	to	Address:	
(mm/dd/yyyy)		City, State, Zip:	
Dates:	to	Address:	
(mm/dd/yyyy)		City, State, Zip:	
Dates:	to	Address:	
(mm/dd/yyyy)		City, State, Zip:	
You may attach additional she	eet(s) if needed.		

To be completed by non-resident bidders

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company's home state or foreign country offer preferences to bidders who are residents?

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name:

Signature:

Date:

0400 BID BOND INDIAN CREEK WATER QUALITY IMPROVEMENTS

KNOW ALL BY THESE PRESENTS:

That we,	, as Principal, an	d,		
as Surety, a	ety, are held and firmly bound unto Cedar Rapids Linn County Solid Waste Agency, as Obligee,			
(hereinafter	referred to as "the Owner"), in the penal sum of			
	dollars (\$), or five percent (5%)		
of the amou	nt bid in lawful money of the United States, for which	payment said Principal and Surety bind		
themselves,	their heirs, executors, administrators, successors, an	d assigns jointly and severally, firmly by		
these preser	nts.			

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain proposal, in a separate envelope, and hereby made a part hereof, to enter into a contract in writing, for the following described improvements;

This project includes construction of a wetland area to be used as a runoff buffer between farmland and Indian Creek located Marion Township, Linn County, Iowa. This project also includes the construction of a bioreactor to assist with nutrient reduction from subsurface farm tile.

The Surety hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such bid or execute such Contract; and said Surety does hereby waive notice of any such extension.

In the event that any actions or proceedings are initiated with respect to this Bond, the parties agree that the venue thereof shall be Linn County, State of Iowa. If legal action is required by the Owner against the Surety or Principal to enforce the provisions of the bond or to collect the monetary obligation incurring to the benefit of the Owner, the Surety or Principal agrees to pay the Owner all damages, costs, and attorney fees incurred by enforcing any of the provisions of this Bond. All rights, powers, and remedies of the Owner hereunder shall be cumulative and not alternative and shall be in addition to all rights, powers and remedies given to the Owner, by law. The Owner may proceed against Surety for any amount guaranteed hereunder whether action is brought against Principal or whether Principal is joined in any such action or actions or not.

NOW, THEREFORE, if said proposal by the Principal be accepted, and the Principal shall enter into a contract with Owner in accordance with the terms of such proposal, including the provision of insurance and of a bond as may be specified in the contract documents, with good and sufficient surety for the faithful performance of such contract, for the prompt payment of labor and material furnished in the prosecution thereof, and for the maintenance of said improvements as may be required therein, then

this obligation shall become null and void; otherwise, the Principal shall pay to the Owner the full amount of the bid bond, together with court costs, attorney's fees, and any other expense of recovery.

Signe	d and sealed this day of		, 20	
	SURETY:		PRINCIPAL:	
	Surety Company		Bidder	
Bv		Bv		
,	Signature Attorney-in-Fact/Officer	,	Signature	
	Printed Name of Attorney-in-Fact/Officer		Printed Name	
	Company Name		Title	
	Company Address		Address	
	City, State, Zip Code		City, State, Zip Code	
	Company Telephone Number		Telephone Number	

NOTE: All signatures on this bid bond must be original signatures in ink; copies, facsimile, or electronic signatures will not be accepted. This bond must be sealed with the Surety's raised, embossing seal. The Certificate or Power of Attorney accompanying this bond must be valid on its face and sealed with the Surety's raised, embossing seal.

0500 CONTRACT INDIAN CREEK WATER QUALITY IMPROVEMENTS

THIS CONTRACT, made and entered into on this _____ day of ______, 20____, by and between the **Cedar Rapids Linn County Solid Waste Agency**, upon order of its Board of Directors, hereinafter called the "Owner," and ______, hereinafter called the "Contractor."

WITNESSETH:

The Contractor hereby agrees to complete the work comprising the below referenced improvement as specified in the contract documents, which are officially on file with the Owner, in the Administration Building, 1954 County Home Road, Marion, Iowa 52302. This contract includes all contract documents. The work under this contract shall be constructed in accordance with the **Iowa Statewide Urban Design and Specifications (SUDAS) Standard Specifications, 2022 Edition,** and further modified by the **Natural Resources Conservation Service (NRCS) Construction Specifications, Supplemental Specifications,** and **Special Provisions included in said contract documents**, and the Contract Attachment - Item 1: General Site Access, which is attached hereto. The Contractor further agrees to complete the work in strict accordance with said contract documents, and to guarantee the work as required by law, for the time required in said contract documents, after its acceptance by the Owner.

This contract is awarded and executed for completion of the work specified in the contract documents for the bid prices shown on the Contract Attachment - Item 2: Bid Items, Quantities, and Prices, which were proposed by the Contractor in its proposal submitted in accordance with the Notice to Bidders for the following described improvements:

This project includes construction of a wetland area to be used as a runoff buffer between farmland and Indian Creek located Marion Township, Linn County, Iowa. This project also includes the construction of a bioreactor to assist with nutrient reduction from subsurface farm tile.

IN WITNESS WHEREOF, the Parties hereto have executed this instrument, in triplicate on the date first shown written.

OWNER	CONTRACTOR		
Ву		Contractor	
Name	Ву	Signature	
Title		Title	
ATTEST:		Street Address	
		City, State, Zip Code	
Title		Telephone	

CONTRACTOR PUBLIC REGISTRATION INFORMATION To Be Provided By:

- 1. <u>All Contractors:</u> The Contractor shall enter its Public Registration Number _____ ___ ___ issued by the Iowa Commissioner of Labor pursuant to Section 91C.5 of the Iowa Code.
- 2. <u>Out-of-State Contractors:</u>
 - A. Pursuant to Section 91C.7 of the Iowa Code, an out-of-state contractor, before commencing a contract in excess of five thousand dollars in value in Iowa, shall file a bond with the division of labor services of the department of workforce development. It is the contractor's responsibility to comply with said Section 91C.7 before commencing this work.
 - B. Prior to entering into contract, the designated low bidder, if it is a corporation organized under the laws of a state other than lowa, shall file with the Engineer a certificate from the Secretary of the State of lowa showing that it has complied with all the provisions of Chapter 490 of the lowa Code, or as amended, governing foreign corporations.



CONTRACT ATTACHMENT: ITEM 1 – GENERAL SITE ACCESS

CONTRACT ATTACHMENT: ITEM 2 - BID ITEMS AND QUANTITIES

This contract is awarded and executed for completion of the work specified in the contract documents for the bid prices tabulated below as proposed by the Contractor in its proposal submitted in accordance with notice to bidders and notice of public hearing. All quantities are subject to revision by the Owner. Quantity changes that amount to 20% or less of the amount bid shall not affect the unit bid price.

ITEM	SUDAS No.	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
1	0000-CR-A	Dike with Shallow Water Excavation Treating Day-Lighted Tile	LS	1	\$	\$
2	0000-CR-B	Denitrifying Bioreactor	LS	1	\$	\$
3	4030-A-1	Pipe Culvert, Trenched, RCP Class V, 24"	LF	75	\$	\$
4	4030-B	Pipe Apron, RCP Class V, 24"	EA	2	\$	\$
5	4030-C	Footing for Concrete Pipe Apron	EA	2	\$	\$
6	9040-A-2	SWPPP Management	LS	1	\$	\$
7	11,010-В	Construction Survey	LS	1	\$	\$
8	11,020-A	Mobilization	LS	1	\$	\$

TOTAL EXTENDED AMOUNT \$

INSTRUCTIONS:

This space is provided for the Owner to list the bid items and cost information from the low bidders proposal.

CONTRACT ATTACHMENT: ITEM 3 – SAFETY REQUIREMENTS



Cedar Rapids Linn County Solid Waste Agency Contractor Safety Briefing — ALL SITES

Personal Safety

- ⇒ There is NO SMOKING on agency property. Vendors, contractors or temporary laborers failing to adhere to this rule may be banned from the site.
- ⇒ Personal protective equipment (PPE): We require all vendors, contractors, temps, and Agency staff to wear the following personal protective equipment:
 - Gloves, when contacting waste or chemicals, including oil and fuel
 - Hi-vis gear (vest, coat, or shirt)
 - Steel toed boots
 - Safety glasses
- ⇒ Bloodborne Pathogens: Working with or around waste means that there is always the potential for exposure to bloodborne pathogens and infectious agents such as hepatitis. To control this risk, we recommend that you get a Hep B vaccine series. Contact our EHS Manager for more information. In the event of contact with sharps or other potentially pathogenic waste, notify the site supervisor or a member of management immediately.
- ⇒ Injury or Medical Emergency: In the event that a vendor or contractor suffers an injury, please contact the site supervisor or a member of management immediately. In the event of a medical emergency or injury involving a customer or coworker, call 911. There are first aid kits in the office; shop, and break room. Landline phones are in the office/scale house. Emergency call lists are posted in the office/scale house and both break rooms.
- ⇒ Respiratory protection and Dust: Onsite roads can be dusty. Nuisance dust masks for voluntary use are available in the shop. These masks are for nuisance dusts only and are NOT intended to be used as respirators. If you have questions about the Agency's respiratory protection program, please contact our EHS manager.

Site Safety

 \Rightarrow Scavenging or Salvaging Waste or Recyclables are STRICTLY PROHIBITED

- Confined Spaces: Due to the potential for hazardous atmospheres resulting from landfill gases contractors and vendors are strictly prohibited from entering onsite confined spaces without consulting the Agency EHS Manger. Confined spaces include all sumps, manholes, storm sewers, culverts, tanks, and the pit areas underneath the scales. Trenches and lagoons are also considered confined spaces. Confined space entries will be permitted contingent upon the following: Entries must be pre-approved and conducted by properly equipped, trained and authorized persons; pertinent training records must be submitted; confined space permit must be completed; the internal atmosphere of the confined space must be tested for oxygen content, flammable gases and vapors prior to entry; continuous monitoring of the atmosphere is required for the duration of the entry and additional requirements may apply depending on the space.
- ⇒ Hot loads, and facility or landfill fires: A "hot load" is a smoldering or burning load of waste that can cause a landfill fire. Agency staff uses both stockpiled soil and the water truck to suppress fires. The water truck is always kept full and must be accessible in the event of an onsite fire. Call 911 if the fire cannot be extinguished with on-site resources. If there is a fire involving the gas system, or fuel storage areas, evacuate immediately and call 911. Any person who observes or suspects a fire should notify Agency staff immediately.
- ⇒ Landfill infrastructure (Gas and Leachate): Agency landfills utilize leachate and landfill gas collection systems. These systems are required by our permit and regulated by state and federal law.

- Landfill gas (including methane and hydrogen sulfide) is highly flammable, thus **there is no smoking on Agency property.** If you observe an employee or vendor smoking onsite, please tell them to extinguish their cigarette immediately. All contractors are expected to help enforce our no smoking policy to their employees and subs.

- Leachate may not be released to storm water or released offsite. All leachate must be directed to the collection system and disposal through the sanitary sewer.

- In the event that you observe strong landfill gas odors or leachate seeps or ponding of impacted liquid anywhere onsite,

Vehicle Safety

- ⇒ Seatbelts are mandatory when operating vehicles or equipment on Agency property. Only Agency employees are authorized to operate the Agency vehicles or equipment.
- ⇒ We have a posted speed limit of 15 MPH throughout the site. Vendors or contractors failing to adhere to the speed limit may be banned from the site.
- ⇒ **Follow established traffic patterns**: Do not drive into the site against traffic. Stay to the right of the scale house.
- ⇒ Safety Around Vehicles: Please exercise situational awareness when onsite, particularly around all vehicles and equipment. Look both ways before crossing roadways or drive-through areas and seek to make eye contact with vehicle drivers and equipment operators before crossing their path. The site access roads can be very busy – cross with caution! Never walk behind, crawl, walk under, or stand behind vehicles or machines. Use extreme caution when backing up.
- ⇒ Lock out/tag out: NEVER start, operate or attempt to repair equipment that has been tagged out. Always check around and underneath vehicles before starting or moving. Exercise extreme caution around or near equipment or vehicles that have the potential to unexpectedly energize, close, roll, drop, pinch, or otherwise release hazardous energy due to work activities, damage, service, or maintenance activities.

Site Communication

- ⇒ Radio and Cell Phone Communication: When working onsite, either at the landfill, sawtooth, on grounds or in the RRB, operational staff and laborers must have a working radio on. We ask that contractors and vendors inform staff of their presence in work areas, and NOT use cell phones when operating vehicles on Agency property.
- ⇒ Safety Data Sheets (SDS) for chemicals and fuels used onsite are in 3-ring binders available in the breakroom and in the shop. All chemicals brought onto Agency property by vendors must be accompanied by a Safety Data Sheet and must be available to Agency staff upon request.
- ⇒ Spills and Releases: In the event of a spill of chemical or fuel on Agency property, or a release of leachate or gas resulting from site work, vendors and contractors are required to notify a member of management immediately.
- ⇒ Safety Program: We hold monthly safety meetings where staff are given an opportunity to discuss near-misses and incidents. If at any time you have a question or concern about site safety, about operation of equipment, or are unsure about performing any task, management has an open-door policy. You can talk to anyone of us.

Agency Contact Information

Samantha Eckes Environmental Heath & Safety Manager (319) 377-5290, ext:105 seckes@solidwasteagency.org

CONTRACT ATTACHMENT: ITEM 4 – LIABILITY WAIVER



VENDOR Agreement - Release of Liability

I hereby release from liability and agree to indemnify and hold harmless the Cedar Rapids Linn County Solid Waste Agency (Agency), and any of its employees representing or related to the Agency, for any liability in connection with the services to be provided to the Agency by my company.

This release is for any and all liability, for personal injuries and property losses or damage occasioned by, or in connection with, the use of Agency facilities or equipment to assist the vendor.

Company Name _____

Signature _____

Print Name _____

Date _____

0600 PERFORMANCE, PAYMENT, AND MAINTENANCE BOND INDIAN CREEK WATER QUALITY IMPROVEMENTS

KNOW ALL BY THESE PRESENTS:

That we,	, as Principal
(hereinafter the "Contractor" or "Principal" and	, as
Surety are held and firmly bound unto Cedar	Rapids Linn County Solid Waste Agency, as Obligee
(hereinafter referred to as the "Owner"), and to	all persons who may be injured by any breach of any of the
conditions of this Bond in the penal sum of	dollars
(\$), lawful money of t	he United States, for the payment of which sum, well and
truly to be made, we bind ourselves, our heirs,	legal representatives and assigns, jointly or severally, firmly
by these presents.	

The conditions of the above obligations are such that whereas said Contractor entered into a contract with the Owner, bearing date the ______ day of ______, 20____, hereinafter the "Contract") wherein said Contractor undertakes and agrees to construct the following described improvements:

This project includes construction of a wetland area to be used as a runoff buffer between farmland and Indian Creek located Marion Township, Linn County, Iowa. This project also includes the construction of a bioreactor to assist with nutrient reduction from subsurface farm tile.

and to faithfully perform all the terms and requirements of said Contract within the time therein specified, in a good and workmanlike manner, and in accordance with the Contract Documents.

It is expressly understood and agreed by the Contractor and Surety in this bond that the following provisions are a part of this Bond and are binding upon said Contractor and Surety, to-wit:

- PERFORMANCE: The Contractor shall well and faithfully observe, perform, fulfill, and abide by each and every covenant, condition, and part of said Contract and Contract Documents, by reference made a part hereof, for the above referenced improvements, and shall indemnify and save harmless the Owner from all outlay and expense incurred by the Owner by reason of the Contractor's default of failure to perform as required. The Contractor shall also be responsible for the default or failure to perform as required under the Contract and Contract Documents by all its subcontractors, suppliers, agents, or employees furnishing materials or providing labor in the performance of the Contract.
- 2. PAYMENT: The Contractor and the Surety on this Bond hereby agreed to pay all just claims submitted by persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the performance of the Contract on account of which this Bond is given, including but not limited to claims for all amounts due for labor, materials, lubricants, oil, gasoline, repairs on machinery, equipment, and tools, consumed or used by the Contractor or any subcontractor, wherein the same are not satisfied out of the portion of the contract price the Owner is required to retain until completion of the improvement, but the Contractor and Surety shall not be liable to said persons, firms, or corporations unless the claims of said claimants against said portion of the

contract price shall have been established as provided by law. The Contractor and Surety hereby bind themselves to the obligations and conditions set forth in Chapter 573 of the Iowa Code, which by this reference is made a part hereof as though fully set out herein.

- 3. MAINTENANCE: The Contractor and the Surety on this Bond hereby agree, at their own expense:
 - A. To remedy any and all defects that may develop in or result from all work except new paving to be performed under the Contract within the period of two (2) year(s) from the date of acceptance of the work under the Contract, by reason of defects in workmanship or materials used in construction of said work; and
 - B. To keep all work in continuous good repair; and
 - C. To pay the Owner's reasonable costs of monitoring and inspection to assure that any defects are remedied, and to repay the Owner all outlay and expense incurred as a result of Contractor's and Surety's failure to remedy any defect as required by this section.
 - D. Maintenance bond requirements shall not apply to the following: work that is not permanently incorporated into the project, pavement markings, seeding, sodding, and plant material and planting.
- 4. GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:
 - A. To consent without notice to any extension of time to the Contractor in which to perform the Contract;
 - B. To consent without notice to any change in the Contract or Contract Documents, which thereby increases the total contract price and the penal sum of this bond, provided that all such changes do not, in the aggregate, involve an increase of more than 20% of the total contract price, and that this bond shall then be released as to such excess increase; and
 - C. To consent without notice that this Bond shall remain in full force and effect until the Contract is completed, whether completed within the specified contract period, within an extension thereof, or within a period of time after the contract period has elapsed and the liquidated damage penalty is being charged against the Contractor.
 - D. That no provision of this Bond or of any other contract shall be valid that limits to less that five years after the acceptance of the work under the Contract the right to sue on this Bond.
 - E. That as used herein, the phrase "all outlay and expense" is not to be limited in any way, but shall include the actual and reasonable costs and expenses incurred by the Owner including interest, benefits, and overhead where applicable. Accordingly, "all outlay and expense" would include but not be limited to all contract or employee expense, all equipment usage or rental, materials, testing, outside experts, attorneys fees (including overhead expenses of the Owner's staff attorneys), and all costs and expenses of litigation as they are incurred by the Owner. It is intended the Contractor and Surety will defend and indemnify the Owner on all claims made against the Owner on account of Contractor's failure to perform as required in the Contract and Contract Documents, that all agreements

and promises set forth in the Contract and Contract Documents, in approved change orders, and in this Bond will be fulfilled, and that the Owner will be fully indemnified so that it will be put into the position it would have been in had the Contract been performed in the first instance as required.

In the event the Owner incurs any "outlay and expense" in defending itself against any claim as to which the Contractor or Surety should have provided the defense, or in the enforcement of the promises given by the Contractor in the Contract, Contract Documents, or approved change orders, or in the enforcement of the promises given by the Contractor and Surety in this Bond, the Contractor and Surety agree that they will make the Owner whole for all such outlay and expense, provided that the Surety's obligation under this bond shall not exceed 125% of the penal sum of this bond.

In the event that any actions or proceedings are initiated regarding this Bond, the parties agree that the venue thereof shall be Linn County, State of Iowa. If legal action is required by the Owner to enforce the provisions of this Bond or to collect the monetary obligation incurring to the benefit of the Owner, the Contractor and the Surety agree, jointly, and severally, to pay the Owner all outlay and expense incurred therefor by the Owner. All rights, powers, and remedies of the Owner hereunder shall be cumulative and not alternative and shall be in addition to all rights, powers, and remedies given to the Owner, by law. The Owner may proceed against surety for any amount guaranteed hereunder whether action is brought against the Contractor or whether Contractor is joined in any such action(s) or not.

NOW THEREFORE, the condition of this obligation is such that if said Principal shall faithfully perform all the promises of the Principal, as set forth and provided in the Contract, in the Contract Documents, and in this Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

When a word, term, or phrase is used in this Bond, it shall be interpreted or construed first as defined in this Bond, the Contract, or the Contract Documents; second, if not defined in the Bond, Contract, or Contract Documents, it shall be interpreted or construed as defined in applicable provisions of the Iowa Code; third, if not defined in the Iowa Code, it shall be interpreted or construed according to its generally accepted meaning in the construction industry; and fourth, if it has no generally accepted meaning in the construction industry, it shall be interpreted or construed according to its common or customary usage.

Failure to specify or particularize shall not exclude terms or provisions not mentioned and shall not limit liability hereunder. The Contract and Contract Documents are hereby made a part of this Bond.

PRINCIPAL:

Contractor

By

Signature

Title

FORM APPROVED BY:

Attorney for Owner

Surety Company

Ву

SURETY:

Signature Attorney-in-Fact Officer

Printed Name of Attorney-in-Fact Officer

Company Name

Company Address

City, State, Zip Code

Company Telephone Number

NOTE:

- 1. All signatures on this performance, payment, and maintenance bond must be original signatures in ink; copies, facsimile, or electronic signatures will not be accepted.
- 2. This bond must be sealed with the Surety's raised, embossing seal.
- 3. The Certificate or Power of Attorney accompanying this bond must be valid on its face and sealed with the Surety's raised, embossing seal.
- 4. The name and signature of the Surety's Attorney-in-Fact/Officer entered on this bond must be exactly as listed on the Certificate or Power of Attorney accompanying this bond.

0700 SUPPLEMENTAL SPECIFICATIONS

The Natural Resources Conservation Service (NRCS) Construction Specifications are incorporated herein to supplement the Iowa Statewide Urban Design and Specifications (SUDAS) Specification Manual 2022 Edition.

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATIONS

For

_____ County, Iowa

List of Specifications

Specification Number

<u>Title</u>

Pages

These specifications are part of the construction plans. The work shall be performed in accordance with the drawings and specifications unless otherwise approved, in writing, by NRCS. For items of work requiring NRCS inspection, it is the responsibility of the contractor to keep the local NRCS office informed of the progress of work so that timely inspections may be performed. Work installed without NRCS inspection will not be certified as meeting NRCS standards.

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-5 POLLUTION CONTROL

1. SCOPE

The work shall consist of installing measures or performing work to control erosion and minimize the production of sediment and other pollutants to water and air during construction operations.

2. MATERIALS

All materials furnished shall meet the requirements shown on the drawings or in the specifications.

3. EROSION AND SEDIMENT CONTROL MEASURES AND WORKS

The measures and works shall include, but are not limited to, the following:

Staging of Earthwork Activities: The excavation and moving of soil materials shall be scheduled so that areas unprotected from erosion will be minimized. These areas will be unprotected for the shortest time feasible.

Seeding: Structures and disturbed areas shall be seeded as soon as possible after construction is completed.

Temporary seedings may be used as an alternative to other stabilization measures as approved by NRCS.

Mulching: Construction areas that have been disturbed but have no construction activity scheduled for 21 days or more shall have erosion protection measures applied by the 14th day. This erosion protection may be mulching or other approved temporary measures. Construction areas shall not be left open during a winter shutdown period and shall be protected by mulching.

All seeding and mulching shall be completed in accordance with the seeding plan and Iowa Construction Specification IA-6, Seeding and Mulching for Protective Cover.

The following works may be temporary. If they are installed as a temporary measure, they shall be removed and the area restored to its original state when they are no longer needed or when permanent measures are installed.

Diversions: Diversions may be required to divert clean runoff water away from work areas and to collect runoff from work areas for treatment and safe disposition.

Stream Crossings: Culverts or bridges may be required where construction equipment must cross streams.

Sediment Basins: Sediment basins may be required to settle and filter out sediment from eroding areas to protect properties and streams below the construction site.

Sediment Filters: Straw bale filters, geotextile sediment fences, or other equivalent methods may be used to trap sediment from areas of limited runoff. Sediment filters shall be properly anchored to prevent erosion under them.

Waterways: Waterways may be required for the safe removal of runoff from fields, diversions, and other structures or measures.

4. CHEMICAL POLLUTION

The Contractor shall provide watertight tanks or barrels or construct a sump sealed with plastic sheets to be used to dispose of chemical pollutants, such as drained lubricating or transmission oils, greases, soaps, concrete mixer wash water, asphalt, etc., produced as a by-product of the construction work. At the completion of the construction work, sumps shall be removed and the area restored without causing pollution.

Sanitary facilities such as chemical toilets or septic tanks shall not be placed adjacent to live streams, wells, or springs. They shall be located at a distance sufficient to prevent contamination of any water sources. At the completion of construction work, facilities shall be disposed of without causing pollution.

5. AIR POLLUTION

The burning of brush or trash or disposal of other materials shall adhere to local and state regulations.

Fire prevention measures shall be taken to prevent the start or the spreading of wild fires, which result from project work. Fire breaks or guards shall be constructed at locations shown on the drawings.

All public access or haul roads used by the contractor during construction of the project shall be sprinkled or otherwise treated to fully suppress dust. All dust control methods shall insure safe operations at all times. If chemical dust suppressants are used, the material shall be a commercially available product specifically designed for dust suppression and the application shall follow manufacturer's requirements and recommendations. A copy of the product data sheet and manufacturer's recommended application procedures shall be provided to the Engineer five working days before use.

6. MAINTENANCE, REMOVAL, AND RESTORATION

All pollution control measures and works shall be adequately maintained in a functional condition as long as needed during the construction operation. All temporary measures shall be removed and the site restored to as near original conditions as practical.

7. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-6 SEEDING AND MULCHING FOR PROTECTIVE COVER

1. SCOPE

The work shall consist of seeding, mulching, and fertilizing all disturbed areas and other areas as indicated on the drawings or otherwise designated.

2. SEEDBED PREPARATION AND APPLICATION

The entire area to be seeded shall be reasonably smooth and all washes and gullies shall be filled to conform to the desired cross-section before actual seedbed preparation is begun. At this stage of the operation, the required fertilizer and lime shall be applied uniformly and incorporated into the top 3 inches of the soil with suitable tillage equipment. The seedbed preparation operation shall be suspended when the soil is too wet or too dry. The seedbed shall be loosened to a depth of at least three inches.

On side slopes steeper than 2-1/2 horizontal to1 vertical, the 3 inch minimum depth of seedbed preparation is not required, but the soil shall be worked enough to insure sufficient loose soil to provide adequate seed cover.

Unless otherwise specified, the seeding operation shall be performed immediately after preparation of the seedbed. The seed shall be drilled or broadcast by equipment that will insure uniform distribution of the seed.

3. MATERIALS

The seeding, fertilizing, and mulching requirements are as specified on Form IA-CPA-4.

Straw from cereal grains or hay will be used as mulching material. It shall be relatively free of weeds.

4. MULCH APPLICATION

The required mulching shall be performed as soon as possible after seeding unless otherwise specified. The mulch shall be applied uniformly over the area. The type and rate shall be as specified. When mulching is required, all areas seeded during any one day shall be mulched within 24 hours. The mulch may be spread by any means that results in a uniform cover.

The mulch shall be anchored. Anchoring of the mulch may be performed by a mulch anchoring tool or regular farm disk weighted and set nearly straight, by installation of mulch netting, or by other methods approved by NRCS.

5. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-9 SUBSURFACE DRAIN INVESTIGATION, REMOVAL, AND REPAIR

1. SCOPE

The work shall consist of investigation, location, repair, and/or removal of subsurface drains (tile) near new or existing animal waste storage facilities or in wetland restoration, enhancement, or creation project areas, or other situations where subsurface drains may be present.

2. INVESTIGATION AND LOCATION

An inspection trench at least 10 inches wide shall be dug at the location shown on the drawings or as directed by the engineer or his representative. The trench shall be at least 6 feet deep measured from the original ground line, unless otherwise shown on the plans. The Engineer or his representative shall examine the trench and excavated material to identify tile lines.

Size, material, operating condition and direction of flow of each conduit shall be documented. Location and flow line elevation of each conduit shall be surveyed with horizontal and vertical control based on benchmarks shown on the plans.

The inspection trench shall be documented by surveying the natural ground and trench bottom location and elevations at the beginning, end, and every 50 feet for trenches longer than 50 feet.

Backfilling shall not be started without approval of the Engineer. See Section 5 for backfill specifications.

Trench shields, shoring and bracing, or other methods necessary to safeguard the workers and work, and to prevent damage to the existing improvements shall be furnished, placed, and subsequently removed by the contractor.

3. TILE REPAIR

Unless designated for removal, replace damaged conduit with new conduit having equal or greater capacity using material specified in Section 6 or 7. When replacing short sections of clay or concrete tile with single-wall corrugated polyethylene pipe, use the next larger nominal size.

Make connections with manufactured fittings and tight joints. Where joints have gaps that would allow soil to enter, cover the joint with a permanent type material such as coal tar pitch treated roofing paper, fiber glass sheet or mat, or plastic sheet.

If the investigation trench has been excavated below the existing drain grade, backfill the trench with gravel or well-pulverized soil in layers not over four (4) inches thick and tamp by hand or manually directed power tamper to provide a firm foundation for the conduit at the existing grade. Do not backfill with any soil containing broken tile fragments.

Using selected soil free of hard clods, rocks, or frozen soil, hand tamp the backfill material around the haunch of the pipe in layers not over four (4) inches thick to provide support. Hold the conduit in place mechanically while placing excavated material around and over the conduit to ensure proper alignment and grade is maintained. Complete the backfill operation according to Section 5.

4. TILE REMOVAL

Remove conduits as shown on the plans or directed by the Engineer or his representative, including envelope filter material or other flow enhancing material when present.

Cap or plug the open ends of the disconnected conduit to prevent soil entry when the conduit will continue to function downstream, or otherwise shown on the plans. For a minimum distance of two feet around each sealed conduit end, backfill in layers not over four (4) inches thick and tamp by hand or manually directed power tamper to a density equal to or greater than the surrounding undisturbed soil. Do not backfill with any soil containing broken tile fragments, large stones, frozen material, or large dry clods.

Where tile are located beneath an existing animal waste facility, remove the tile or fill the entire length of tile with concrete or Portland cement grout as shown on the plans. When tile removal is specified, the owner shall contact the Iowa Department of Natural Resources (IDNR) for permission to remove the drainage tile under the structure. The structure shall be emptied of waste or lowered to a point below the tile prior to its removal. The structure must be retested for percolation and the results submitted to IDNR and approval received prior to reusing the structure.

If shown on the plans or directed by the engineer, reroute upstream drain lines so the capacity of the upstream drainage system is maintained. Install conduit in accordance with Iowa Construction Specification IA-46, Tile Drains for Land Drainage.

5. BACKFILL

Compact soil around disturbed tile as specified in Section 3 (Tile Repair) and Section 4 (Tile Removal). Keep the backfill within 5 feet of the conduit free from large stones, frozen material, and large dry clods. Unless otherwise shown on the plans, backfill the remainder of the trench as follows:

For trenches located under or near structures, backfill in 12 inch layers and compact each layer to a density equal to or greater than the surrounding undisturbed soil.

For other locations, backfill the remainder of each trench with the excavated soil material which shall extend above the ground surface and be well rounded over the trench.

6. MATERIALS

Unless otherwise shown on the plans, conduit and fittings used for repair shall conform to the specifications listed in Table 1. Perforated pipe shall have a water inlet area of at least 1 square inch per foot, provided by perforations spaced uniformly along the long axis of the pipe. The perforations shall be circular or slots. Circular perforations shall not exceed 3/16 inch in diameter. Slots shall not be more than 1/8 inch wide.

Table 1. Acceptable pipe for subsurface drain repair

Kind of Pipe [#]	Specification
Corrugated Polyethylene (PE) Pipe and Fittings, 3 to 6 inch	ASTM F 405
Corrugated Polyethylene (PE) Pipe and Fittings, 3 to 24 inch	ASTM F 667
Corrugated Profile Wall (Dual Wall) Polyethylene (PE) pipe, 2 to 60 inch	ASTM F 2648 ^{\$}
Corrugated Profile Wall (Dual Wall) Polyethylene (PE) pipe, 12 to 60 inch	ASTM F 2306 ^{\$}
Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120	ASTM D 1785
PVC Pressure-Rated Pipe (SDR Series)	ASTM D 2241
Clay drain tile	ASTM C 4
Concrete drain tile	ASTM C 412

[#] Pipe sizes are nominal and the ranges are inclusive
^{\$} Pipe conforming to AASHTO M 252 (3 to 10 inch), or AASHTO M 294 (12 to 60 inch) is acceptable

7. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-21 EXCAVATION

1. SCOPE

The work shall consist of the excavation required by the drawings and specifications and disposal of the excavated materials. The cutoff trench and any other required excavations shall be dug to the lines and grades shown on the drawings or as staked in the field. Structure or trench excavations will conform to all safety requirements of OSHA.

2. USE OF EXCAVATED MATERIALS

Suitable materials from the specified excavations shall be used in the construction of required permanent earth fill. The suitability of materials for specific purposes shall be determined by the NRCS Inspector.

3. DISPOSAL OF WASTE MATERIAL

All surplus or waste material shall be disposed of in areas shown on the drawings or as approved by the NRCS Inspector. The waste material shall be smoothed and sloped to provide drainage.

4. STRUCTURE AND TRENCH EXCAVATION

Structure or trench excavations will conform to all safety requirements of OSHA.

5. BORROW EXCAVATION

When the quantities of suitable materials obtained from specified excavations are insufficient to construct the specified fills, additional materials shall be obtained from the designated borrow areas as shown on the drawings or as approved by NRCS and the landowner. On wetland projects, borrow shall not be taken from the wetland area within 10 feet of the embankment or as shown on the drawings.

Borrow areas shall be excavated and grading completed in a manner to eliminate steep or unstable side slopes or hazardous or unsightly conditions.

6. OVER-EXCAVATION

Excavation beyond the specified lines and grades shall be corrected by filling the resulting voids with compacted earthfill, except that if the earth is to become the subgrade for riprap, sand or gravel bedding or drainfill, the voids shall be filled with material conforming to the specifications for the riprap, bedding or drainfill, as appropriate.

7. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-23 EARTHFILL

1. SCOPE

The work shall consist of the construction of earth fills required by the drawings and specifications. The completed work shall conform to the lines, grades, and elevations shown on the drawings or as staked in the field.

2. MATERIALS

All fill materials shall be obtained from required excavations and designated borrow areas. Fill materials shall contain no sod, brush, roots or other bio-degradable materials. Rocks larger than 6 inches in diameter shall be removed prior to compaction of the fill.

3. FOUNDATION PREPARATION

Foundations for earthfill shall be stripped a minimum of 6 inches to remove vegetation and other unsuitable materials. Foundation surfaces shall be scarified to a minimum depth of 2 inches prior to placing fill material.

Foundation and abutment surfaces shall not be sloped steeper than 1.5 horizontal to 1 vertical unless otherwise shown on the drawings.

4. PLACEMENT

Fill shall not be placed until the required excavation and foundation preparation have been completed and the foundation has been inspected and approved by NRCS. Fill shall not be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill.

Adjacent to structures or pipes, fill shall be placed in a manner which will prevent damage. The height of the fill adjacent to structures or pipes shall be increased at approximately the same rate on all sides.

The materials used throughout the earth fill shall be essentially uniform. Selective placement shall be as shown on the drawings or approved by NRCS.

If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified to a minimum depth of 2 inches before the next layer is placed.

The top surfaces of embankments shall be maintained approximately level during construction, except that a cross-slope of approximately 2% shall be maintained to ensure effective drainage.

When moving fill material from the borrow area(s) to the embankment by use of bulldozers only, the following steps shall be followed:

- Immediately after the borrow material is pushed to the embankment, it shall be spread in horizontal lifts placed parallel to the centerline of the embankment.
- Compactive effort will then be applied by operating equipment parallel to the centerline of the fill or embankment.
- Lift thicknesses shall be in strict compliance with Clause 6, below.

Sectional fills are not allowed unless they are shown on the construction drawings.

5. CONTROL OF MOISTURE CONTENT

The moisture content of the fill material shall be adequate for obtaining the required compaction. Material that is too wet shall be dried to meet this requirement, and material that is too dry shall have water added and mixed until the requirement is met.

The moisture content of the fill material shall be such that a ball formed with the hands does not crack or separate when struck sharply with a pencil and will easily ribbon out between the thumb and finger.

Earth foundations under and adjacent to concrete structures shall be prevented from drying and cracking before concrete and backfill are placed.

The application of water to the fill materials shall be accomplished at the borrow areas insofar as possible.

6. COMPACTION

Earth fill shall be compacted by one of the following methods as specified on the plans or in Section 8, Special Specifications. If no method is specified, compaction will be in accordance with Method 1.

- Method 1 Earthfill shall be placed so that the wheels or tracks of the loaded hauling equipment, traveling in a direction parallel to the centerline of fill, pass over the entire surface of each layer being placed. Low ground pressure vehicles shall not be used for this purpose.
- Method 2 Two (2) complete passes of a tamping-type roller will be made over each layer. The roller shall be capable of exerting a minimum force of two hundred (200) pounds per square inch.
- Method 3 Minimum density shall be 90% of the maximum density as determined by ASTM D 698 and as shown on the plans.

The maximum thickness of a lift of fill before compaction shall be 9 inches, unless otherwise indicated on the drawings.

Fill adjacent to structures, pipe conduits, and appurtenances shall be placed in layers not more than 4 inches thick and compacted to a density equivalent to that of the surrounding fill. Methods used to obtain compaction for fine or coarse grained materials are as follows:

- For fine grained materials, hand tamping or manually directed power tampers may be used. Hand compaction only shall be used to compact the earthfill under the bottom half of circular pipes. Manually directed power tampers shall not be used in tight spaces where applying full compactive effort will result in direct contact of the tamper plate with the pipe. Care should be taken so that compaction around the spillway pipe does not cause uplift of the pipe resulting in a void beneath the pipe.
- For coarse grained materials (sands and gravels), vibratory plate compactors shall be used for obtaining compaction. However, hand tamping shall be used to compact the material under the bottom half of circular pipes.

In all cases, follow manufacturer instructions for the specific compaction equipment being used. Heavy equipment shall not be operated within 2 feet of any structure or pipe.

Compacting of fill adjacent to concrete structures shall not be started until the concrete is 7 days old.

7. ISLANDS, MOUNDS, AND LOAFING AREAS ON WETLAND RESTORATION, ENHANCEMENT, OR CREATION PROJECTS

Islands shall be randomly located within the wetland area at locations shown on the drawings or as staked in the field. The orientation of island shorelines shall be random with attention given to prevailing winds to limit wave damage. In general, the side of the island with the longest dimension shall be parallel to the prevailing wind direction. Side slopes of islands shall be as shown on the drawings, but in no case shall be steeper than 6 horizontal to 1 vertical. Island shapes shall be irregular.

Loafing areas shall be constructed in the areas shown on the drawings or as staked in the field and shall be graded to drain runoff water. The elevation of at least one loafing area should be above the maximum water level whenever possible.

Excavated material not suitable for embankments, wetland dikes, or islands can be used to create mounds or blended into surrounding topography to create a natural appearance. Spoil material shall not be spread on existing wetland areas.

Organic soils shall not be used to construct islands, loafing areas, dikes, or embankments.

8. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-45 PLASTIC (PVC, PE) PIPE

1. SCOPE

The work shall consist of furnishing and installing plastic pipe and the necessary fittings specified herein or as shown on the drawings. This specification does not cover subsurface drainage systems.

2. MATERIALS

<u>Corrugated Polyethylene (PE) Tubing</u>. Corrugated PE tubing and fittings shall conform to the requirements of the applicable specification listed below:

Kind of Pipe	Specification
Corrugated Polyethylene(PE) Tubing and Fittings, Nominal Sizes 3 to 6 inch, inclusive	ASTM F 405
Large Diameter Corrugated Polyethylene Tubing and Fittings, Nominal Sizes 8 to 24 inch, inclusive	ASTM F 667
Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe	ASTMF 894

<u>Poly(Vinyl Chloride) (PVC) Plastic Pipe</u>. PVC pipe and fittings shall conform to the requirements of the applicable specification listed below:

Kind of Pipe	Specification
PVC Plastic Pipe, Schedules 40, 80 and 120	ASTM D 1785
PVC Pressure-Rated Pipe (SDR Series)	ASTM D 2241
PVC Pressure Pipe, 4 in. through 12 in., for Water Distribution	AWWA C900
PVC Water Transmission Pipe, Nominal Diameters 14 in through 36 in	AWWA C905

<u>PVC and PE Plastic Pipe</u>. Plastic pipes meant for non-potable, livestock water supply shall conform to the requirements of the applicable specification listed below:

Kind of Pipe	Specification
Polyethylene (PE) Plastic Pipe, (SIDR-PR) Based on	
Controlled Inside Diameter	. ASTM D 2239
PVC Pressure-Rated Pipe (SDR Series)	. ASTM D 2241

3. FITTINGS AND JOINTS

Pipe joints shall conform to the details shown on the drawings. Pipe shall be installed and joined in accordance with the manufacturer's recommendations.

Joints may be bell and spigot type with elastomeric gaskets, coupling type with elastomeric gasket on each end, or solvent cemented. Gaskets shall conform to ASTM D 1869. Solvent cemented joints shall not be used for pond spillway pipes. Solvent cemented joints for PVC pipe and fittings shall be in accordance with ASTM D 2855. When a lubricant is required to facilitate joint assembly, it shall be a type having no detrimental effect on the gasket or pipe material.

Mechanical joints (split couplings and snap couplings) may be used when joining PE pipe and fittings when the pipe is used for non-pressure flow and a free draining sand or gravel bedding material is provided. Elastomeric-sealed mechanical joints shall be used when joining PE pipe and

fittings under pressure flow or where seepage cannot be tolerated. Where non-pressure pipe is specified, the fittings shall be of the same or similar materials as the pipe and shall provide the same durability and strength as the pipe.

A special case of livestock water supply involves pipes through a dam or embankment. Only PE pipe meeting the above specification may be used. PE pipe, of 1 ¹/₄, 1 ¹/₂, or 2-inch diameter shall be installed so that there are no joints within the embankment area.

Where pressure pipe is specified, fittings shall have a design capacity equal to or exceeding that specified for the pipe to which it is attached. Fittings shall be cast iron, steel, one piece injection molded plastic fitting or fabricated from plastic pipe and one piece injection molded plastic fittings. Pressure pipe fittings shall conform to the requirements of the applicable specification listed below.

Kind of Fitting	Specification
Threaded PVC Plastic Pipe Fittings, Schedule 80	. ASTM D 2464
PVC Plastic Pipe Fittings, Schedule 40	. ASTM D 2466
PVC Plastic Pipe Fittings, Schedule 80	. ASTM D 2467
Butt Heat Fusion (PE) Plastic Fittings for PE Plastic Pipe and Tubing	. ASTM D 3261
Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals	. ASTM D 3139
PVC Pressure Pipe, 4 in. through 12 in., for Water Distribution	AWWA C900
PVC Water Transmission Pipe, Nominal Diameters 14 in through 36 in	. AWWA C905

4. HANDLING AND STORAGE

Pipe shall be delivered to the job site and handled by means which provide adequate support to the pipe and does not subject it to undue stresses or damage. When handling and placing plastic pipe, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting (by metal surfaces or rocks). All special handling requirements of the manufacturer shall be strictly observed. Special care shall be taken to avoid impact when the pipe must be handled at temperatures of 40 degrees F (4.4 degrees C) or less.

Pipe shall be stored on a relatively flat surface so that the barrels are evenly supported. Unless the pipe is specifically coated to withstand exposure to ultraviolet radiation, it shall be covered with an opaque material when stored outdoors for a period of 15 days or longer.

5. TRENCHING

Plastic pipe conduits shall be installed in trenches or plowed in according to the following methods:

- A. **Trencher Constructed** When conditions permit, trenching for pipelines, which are buried from 5 to 6 feet deep, are usually done with a narrow 4 to 6 inch wide chain trencher. Where there is little gravel and the ground is not too wet, these trenchers bring up well pulverized soil that makes good backfill material. Where rocks are not present, any of this material may be backfilled directly around the pipe. There is no practical way to compact the fill in these narrow trenches. The owner must be made aware that this material normally consolidates to its maximum extent in two to five years, but depressions or low spots can be hazards to livestock, humans and equipment.
- B. **Backhoe Constructed Trench** Backhoe trenches are usually a minimum of 12 inches wide. The material frequently comes out of the trench as clods, large chunks, and rocks. Immediately backfill over the pipe with 4 to 6 inches of soil that is free of these clods, large chunks, and rocks. If adequate excavated material is not available, then material such as sand or fine gravel should be imported and placed around the pipe to a depth of 4 to 6 inches over the top of the pipe. Fill the trench with the remaining excavated material.

C. **Plowing** – Plowing, or ripping, is a trenchless method for installing plastic pipe. It is a multi-stage process consisting of positioning a vibrating or static (non-vibrating) plow equipped with a trailing product guide which feeds pipe to the depth setting of the plow as it moves forward. The pipe is inserted into the ground continuously along a predetermined path and depth. The vertical depth of installation is controlled by hydraulic adjustment of the plow shear head and the surface contours. The depth of insertion must be continually adjusted to compensate for changes in terrain.

6. LAYING AND BEDDING THE PIPE

Plastic pipe conduits and fittings shall be installed as shown on the drawings and specified herein. The pipe shall be laid so that there is no reversal of grade between joints, unless otherwise shown on the drawings. The pipe shall be placed with the bell end upstream, unless otherwise specified. The pipe shall be carefully placed on the bedding or into the pipe trench.

Care shall be taken to prevent distortion and damage during unusually hot (over 90 degrees F) or cold weather (under 40 degrees F). After the pipe has been assembled in the trench, it shall be allowed to reach ground temperature before backfilling to prevent pull out of joints due to thermal contraction.

The pipe ends and the couplings shall be free of foreign material when assembled. During the placement of the pipe, each open end of the pipeline shall be closed off by a suitable cover or plug at the end of work on the pipeline each day and until work resumes or installation is complete.

Perforated pipe shall be laid with the perforations down and oriented symmetrically about the vertical centerline. Perforations shall be clear of any obstructions when the pipe is laid.

Pipe shall be firmly and uniformly supported throughout the entire length. Bell-holes shall be made in the bedding under bells or couplings and other fittings to prevent the pipe from being supported by fittings.

- a. <u>Earth Bedding</u>. When bedding is specified, the pipe shall be firmly and uniformly bedded in a shaped bedding groove that closely conforms to the bottom of the pipe for a depth equal to a minimum of 1 inch or 5 percent of the diameter of the pipe, whichever is greater. The bedding material shall be free of rocks or stones greater than 0.5 inch diameter and earth clods greater than 2 inch diameter.
- b. <u>Sand or Gravel Bedding</u>. When sand or gravel bedding is specified, the pipe shall be firmly and uniformly placed on a sand or gravel bed. Sand or gravel fill shall be carefully placed and compacted as specified herein and as shown on the drawings.

A few installations of above ground pipelines have been noted. These installations are normally laid directly on the ground and very close to an existing fence line for protection. Only those pipelines designed to withstand exposure to ultraviolet radiation may be utilized for these installations. Adequate thrust control shall be incorporated in these installations.

7. BACKFILL

The pipe shall be held down during backfilling to the top of the pipe to prevent its being lifted from its original placement.

Within 2 feet of the pipe, backfill shall be carefully placed and compacted by means of hand tamping or manually directed power tampers or plate vibrators to form a continuous uniform support around the pipe. Maximum thickness of layers before compaction within 2 feet of the pipe shall be 4 inches and at more than 2 feet from the pipe a maximum thickness before compaction shall be 9 inches. Unless otherwise specified, the initial backfill shall be compacted to a density equivalent to that of the adjacent fill or foundation materials.

The water content of cohesive backfill material shall be such that, kneaded in the hand, the soil will form a ball which does not readily separate. For non-cohesive sand and gravel backfill material, water content is not a concern for thin lifts.

8. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-46 TILE DRAINS FOR LAND DRAINAGE

1. SCOPE

The work shall consist of furnishing and installing drainage pipe (tubing) and tile and the necessary fittings and appurtenances.

2. MATERIALS

Concrete drain tile shall conform to the requirements of ASTM C 412 and clay drain tile shall conform to the requirements of ASTM C 4.

Corrugated polyethylene (PE) pipe (tubing) and fittings shall conform to ASTM F 405 (3" to 6") or F 667 (3" to 24"), as appropriate. Corrugated profile wall (dual wall) polyethylene (PE) pipe shall meet or exceed the requirements of ASTM F 2648 (2" to 60") or ASTM F 2306 (12" to 60"). Pipe conforming to AASHTO M 252 (3" to 10"), or AASHTO M 294 (12" to 60") is acceptable. Perforated tubing shall have a water inlet area of at least 1 square inch per foot, provided by perforations spaced uniformly along the long axis of the tubing. The perforations shall be circular or slots. Circular perforations shall not exceed 3/16 inch in diameter. Slots shall not be more than 1/8 inch wide.

3. EXCAVATION

Unless otherwise specified, excavation for and subsequent installation of each drain line shall begin at the outlet end and progress upstream.

The trench or excavation for the conduit shall be constructed to the line, depth, cross section, and grade shown on the drawings, or as directed by the NRCS Inspector. The trench bottom shall be smooth and free of exposed rock. If rock is encountered in the trench bottom, over-excavate the trench and place at least 6 inches of compacted earth or sand bedding in the trench to bring it up to the conduit grade.

If not otherwise shown on the drawings, trench width at the top of the conduit shall be the minimum required to permit installation and provide bedding conditions suitable to support the load on the conduit, but with not less than three (3) inches of clearance on each side of the conduit. Maximum trench width shall be the conduit diameter plus 12 inches measured at the top of the conduit, unless approved bedding is installed.

Trench shields, shoring and bracing, or other methods, necessary to safeguard the workers and work, and to prevent damage to the existing improvements shall be furnished, placed, and subsequently removed by the contractor.

Plow installation is allowed. Minimum trench width shall be two (2) inches wider than the conduit on each side. Grade control and bedding conditions shall be closely inspected during plow installation. Boulders, cobbles, or cemented soils can cause the plow to jump and lose grade. These hardpoints can also puncture or dimple and deform the pipe.

4. PREPARING THE BEDDING

Unless otherwise specified, no filter or envelope is required. In stable soils, the bottom of the trench shall be shaped to form a semicircular, trapezoidal, or 90-degree "V" groove in its center. The groove shall be shaped to fit the size of tile. The 90-degree "V" groove shall not be used on conduits greater than 6 inches in diameter.

If the bottom of the trench does not provide a sufficiently stable or firm foundation for the drain tile, a sand-gravel mix or other approved materials shall be used to stabilize the bottom of the trench.

5. FILTER OR ENVELOPE MATERIAL

When a filter is specified, the shape of the bottom of the trench, gradation and the thickness of the filter or envelope material to be placed around the conduit will be as shown on the drawings. The envelope or filter material shall be placed in the bottom of the trench just prior to the laying of the conduit. The conduit shall then be laid and the envelope or filter material placed over the conduit.

6. PLACEMENT AND JOINT CONNECTIONS

All drains shall be laid to grade.

Joints between lateral concrete and clay drain tiles shall vary with soil type as follows:

- a. Peat and muck 1/4 inch preferred, 3/8 inch maximum
- b. Clay 1/8 inch preferred, 1/4 inch maximum
- c. Silt and loam 1/16 inch preferred, 1/8 inch maximum
- d. Sand tightest possible fit.

Joints between main drain tile, which serve only to collect and transport drainage water from lateral tile lines, should be the tightest fit possible.

Where the joint width exceeds the maximum above, the joint shall be covered with a permanent type material such as coal tar pitch treated roofing paper, fiber glass sheet or mat, or plastic sheet.

After placement and blinding of plastic tubing, but prior to backfilling, sufficient time shall elapse to allow the tubing to reach the ambient temperature of the trench. All split fittings shall be securely tied with nylon cord before backfill is placed. When corrugated plastic tubing is used, no more than5% stretch will be allowed.

7. CONNECTIONS

Lateral connections will be made with manufactured appurtenances (wyes, tees, etc.) comparable in strength and durability with the specified conduit unless otherwise shown on the drawings.

Existing drain lines not shown on the drawings but encountered during installation shall be bridged across the trench or connected into the new line, as directed by NRCS.

Connections with the outlet pipe shall be made watertight.

8. OUTLETS

A continuous section of non-perforated conduit at least 20 feet long shall be used at the outlet. At least two- thirds of the outlet pipe shall be buried in the ditch bank, and the cantilever section must extend to the toe of the ditch side slope or the side slope protected from erosion. Acceptable materials for use at the outlet include the following:

- a. Corrugated metal pipe, galvanized or aluminum, 16 gauge minimum;
- b. Smooth steel pipe with a minimum wall thickness of 3/16 inch;
- c. Smooth plastic pipe, polyvinyl chloride (PVC), with a SDR of 26 or less or schedule 40 or heavier; or
- d. Corrugated profile wall (dual wall) polyethylene pipe (PE).

All plastic (PVC) and polyethylene pipe (PE) outlets shall include ultra-violet stabilizer. PVC and PE pipe outlets shall not be used where burning vegetation on the outlet ditch bank is likely to create a fire hazard.

The outlet shall be equipped with a flap-gate type rodent guard.

9. BLINDING

After the conduit is placed in the excavated groove, friable material from the sides of the trench shall be placed around the conduit, completely filling the trench to a depth of not less than six (6) inches over the top of the conduit. For material to be suitable it must not contain hard clods, rocks, frozen soil, or fine material which will cause a silting hazard to the drain. Conduit placed during any one day shall be blinded by the end of the day's work.

10. BACKFILLING

The backfilling of the trench shall be completed as rapidly as consistent with the soil conditions. Automatic backfilling machines may be used. Backfill shall extend above the ground surface and be well rounded over the trench.

Unless otherwise shown on the plans, in mineral soils, the minimum depth of cover over subsurface drains shall be 2.4 feet. In organic soils, the minimum depth of cover after initial subsidence shall be 3.0 feet.

11. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-51 CORRUGATED METAL PIPE CONDUITS

1. SCOPE

The work shall consist of furnishing and placing circular, arched or elliptical corrugated metal pipe and the necessary fittings.

2. MATERIALS

Metallic-coated steel corrugated pipe and fittings shall be zinc-coated or aluminized, Type 2, and shall conform to the requirements of ASTM A 760 and A 929 for the specified type and size of pipe. Aluminum corrugated pipe shall conform to the requirements of ASTM B 745 for the specified type and size of pipe. All pipe is subject to the following additional requirements:

- A. When polymer coating is specified, pipe, coupling bands and anti-seep collars shall be coated in accordance with ASTM A 762. All riveted joints shall be caulked as described in paragraph B.
- B. Pipe with annular corrugations shall be furnished with caulked seams. Riveted pipe joints shall be caulked with a bituminous mastic material during fabrication to provide a watertight joint. All circumferential and longitudinal seams shall be caulked before riveting. This shall be accomplished by applying a uniform bead of the mastic compound to the inner lap surface before riveting such that when the rivets are in place, all voids are filled and a coating of mastic is between the lap surfaces. The inner surface of coupling bands shall be asphalt coated in the field prior to installation. A neoprene gasket having a minimum thickness of 3/8 inch and a minimum width of 7 inches may be used in lieu of mastic coated coupling bands.
- C. Welded or lock seams in helical corrugated pipe are considered to be watertight.
- D. When close riveted pipe is specified: (1) the pipe shall be fabricated so that the rivet spacing in the circumferential seams shall not exceed 3 inches, except that 12 rivets will be sufficient to secure the circumferential seams in 12-inch pipe, and (2) in those portions of the longitudinal seams that will be covered by the coupling bands, the rivets shall have finished flat heads or the rivets and holes shall be omitted and the seams shall be connected by welding to provide a minimum of obstruction to the seating off the coupling bands.
- E. Double riveting or double spot welding of pipe less than 42 inches in diameter may be required. If specified, the riveting or welding shall be done in the manner specified for pipe 42 inches or greater in diameter.

3. COUPLING BANDS

Coupling bands shall meet the requirements of the table below or have detailed drawings submitted for approval by the State Conservation Engineer. Coupling bands shall be of the same minimum thickness (gage) as the pipe being connected.

Description of Coupling Band	Maximum Fill Height, Ft.	Maximum Pipe Diam., In.
24-inch wide coupling band with four 1/2-inch Diam. galvanized rods with tank lugs for annular or helical corrugated metal pipe. Bands shall have a minimum lap of 3 inches.	All	All
Hugger band from Armco Steel Corp. for helical corrugated metal pipe with reformed ends; and for annular corrugated pipe. Bands include O-ring gaskets and two 1/2-inch Diam. galvanized rods and lugs. $\frac{1}{2}$	35	48
Hugger band without rods and lugs but including O-ring gaskets. $\frac{1}{2}$	20	24
Angles riveted or welded to a coupling band and drawn tight with bolts. Bands shall be a minimum of 7 corrugations wide and have a minimum lap of 2 inches.	35	15
Flanged couplings for helical corrugated pipe welded to the ends of the pipe and field assembled by a minimum of 3/8-inch Diam. bolts. A joint sealer shall be placed between the flanges to ensure water tightness.	25	12

1/ Use is limited to sites where soft foundation and conduit elongation is not anticipated.

4. FABRICATION

Fabrication of all appurtenances shall be done as shown on the drawings. All appurtenances shall be made of metallic-coated steel when corrugated steel pipe is used and aluminum when used with aluminum pipe. Dissimilar metals shall not be installed in contact with each other.

5. REPAIR OF DAMAGED COATINGS

The Contractor shall place the pipe without damaging the pipe or coatings. The pipe shall be transported and handled in a manner to prevent damage to the pipe or coating.

Breaks, scuffs, or other damage to the various coatings shall be repaired as follows:

- A. Metallic Coating by thoroughly wire brushing the damaged area and cleaning with solvent, and then painting two coats of one of the following paints:
 - (1) Zinc Dust Zinc Oxide Primer conforming to ASTM D 79 and D 520.
 - (2) Single package, moisture cured urethane prime in silver metallic color.
 - (3) Zinc-rich cold galvanized compound, brush, or aerosol applications.

B. Polymer Coating - apply two coats of polymer material similar to and compatible with the durability, adhesion and appearance of the original polymer coating. The repair coating shall be a minimum thickness of 0.010 (10 mils) after drying and shall bond securely to the pipe.

6. LAYING AND BEDDING THE PIPE

The pipe shall be laid to the line and grade shown on the drawings and shall be firmly and uniformly bedded throughout its entire length. Details of the bedding are as shown on the drawings.

The pipe shall be laid with the outside laps of circumferential joints pointing upstream and with longitudinal laps on the sides at approximately the vertical mid-height of the pipe. Field welding of corrugated galvanized steel pipe will not be permitted. The pipe sections shall be joined with coupling bands.

7. BACKFILLING

Special care shall be taken during backfill operations not to disturb the grade and alignment.

The pipe shall be tied down or loaded sufficiently during backfilling around the sides to prevent its being lifted from the bedding.

Backfill material shall have sufficient moisture so that optimum compaction can be obtained. Backfill around the pipe shall be placed in layers not more than 4 inches thick before compaction.

Each layer of backfill shall be compacted with power tampers, hand tampers, or plate vibrators to the same density requirements as specified for the adjacent embankment. Backfill over and around the pipe shall be brought up uniformly on all sides. The passage of earth moving equipment will not be allowed over the pipe until backfill has been placed above the top of the pipe surface to a depth of two (2) feet.

8. SPECIAL SPECIFICATIONS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-95 GEOTEXTILE

1. SCOPE

This work shall consist of furnishing all materials, equipment, and labor necessary for the installation of geotextile.

2. MATERIAL QUALITY

Geotextile shall be manufactured from synthetic long chain or continuous polymeric filaments or yarns, having a composition of at least 95 percent, by weight, of polypropylene, polyester or polyvinylidene-chloride. The geotextile shall be formed into a stable network of filaments or yarns that retain their relative position to each other, are inert to commonly encountered chemicals and are resistant to ultraviolet light, heat, hydrocarbons, mildew, rodents and insects. Unless otherwise specified, the class and type of geotextile shall be as shown on the drawings and shall meet the requirements for materials that follow:

- a. <u>Woven Geotextile</u> shall conform to the physical properties listed in <u>Table 1</u>. The woven geotextile shall be manufactured from monofilament yarns that are woven into a uniform pattern with distinct and measurable openings. The geotextile shall be manufactured so that the yarns will retain their relative position with regard to each other. The yarns shall contain stabilizers and/or inhibitors to enhance their resistance to ultraviolet light or heat exposure. The edges of the material shall be selvaged or otherwise finished to prevent the outer yarn from unraveling.
- b. <u>Nonwoven Geotextile</u> shall conform to the physical properties listed in <u>Table 2</u>. Nonwoven geotextile shall be manufactured from randomly oriented fibers that have been mechanically bonded together by the needle-punched process. In addition, one side may be slightly heat bonded. Thermally bonded, nonwoven geotextile, in addition to mechanically bonded, nonwoven geotextile, may be used for Road Stabilization. The filaments shall contain stabilizers and/or inhibitors to enhance their resistance to ultraviolet light or heat exposure.
- c. The geotextile shall be shipped in rolls wrapped with a protective covering to keep out mud, dirt, dust, debris and direct sunlight. Each roll of geotextile shall be clearly marked to identify the brand, type and production run.

3. STORAGE

Prior to use, the geotextile shall be stored in a clean dry place, out of direct sunlight, not subject to extremes of either hot or cold, and with the manufacturer's protective cover in place. Receiving, storage, and handling at the job site shall be in accordance with the requirements in ASTM D 4873.

4. SURFACE PREPARATION

The surface on which the geotextile is to be placed shall be graded to the neat lines and grades as shown on the drawings. The surface shall be reasonably smooth and free of loose rock and clods, holes, depressions, projections, muddy conditions and standing or flowing water (unless otherwise shown on the drawings).

5. PLACEMENT

Prior to placement of the geotextile, the soil surface will be inspected for quality assurance of design and construction. The geotextile shall be placed on the approved prepared surface at the locations and in accordance with the details shown on the drawings. The geotextile shall be unrolled along the placement area and loosely laid (not stretched) in such a manner that it will conform to the surface irregularities when material is placed on or against it. The geotextile may be folded and overlapped to permit proper placement in the designated area.

The geotextile shall be joined by overlapping a minimum of 18 inches (unless otherwise specified), and secured against the underlying foundation material. Securing pins, approved and provided by the geotextile manufacturer, shall be placed along the edge of the panel or roll material to adequately hold it in place during installation. Pins shall be steel or fiberglass formed as a "U", "L", or "T" shape or contain "ears" to prevent total penetration. Steel washers shall be provided on all but the "U" shaped pins. The upstream or up-slope geotextile shall overlap the abutting down-slope geotextile. At vertical laps, securing pins shall be inserted through both layers along a line through approximately the midpoint of the overlap. At horizontal laps and across slope laps, securing pins shall be inserted through the bottom layer only. Securing pins shall be placed along a line approximately 2 inches in from edge of the of the placed geotextile at intervals not to exceed 12 feet unless otherwise specified. Additional pins shall be installed as necessary and where appropriate, to prevent any undue slippage or movement of the geotextile. The use of securing pins will be held to the minimum necessary. Pins are to be left in place unless otherwise specified.

Should the geotextile be torn or punctured, or the overlaps disturbed, as evidenced by visible geotextile damage, subgrade pumping, intrusion, or grade distortion, the backfill around the damaged or displaced area shall be removed and restored to the original approved condition. The repair shall consist of a patch of the same type of geotextile being used, overlaying the existing geotextile. The patch shall extend a minimum of 2 feet from the edge of any damaged area.

The geotextile shall not be placed until it can be anchored and protected with the specified covering within 48 hours or protected from exposure to ultraviolet light. Geotextile shall be placed in accordance with the following applicable specification according to the use indicated in drawings:

Slope protection – Class I or II as indicated in Tables 1 and 2.

The geotextile shall not be placed until it can be anchored and protected with the specified covering within 48 hours or protected from exposure to ultraviolet light. Rock shall not be pushed or rolled over the geotextile.

Class I, unprotected – limit height for dropping stone onto bare geotextile to 3 feet.

Class II, protected – require the use of 6 inches a clean pit-run gravel over the geotextile to cushion the stone and limit the height of drop to 3 feet.

On slopes with strong seepage flow, the geotextile must be in intimate contact with the soil to prevent erosion of the soil surface. Use 6 inches of a clean pit-run gravel over the geotextile to hold it in place and minimize voids under the riprap. Embedment of the geotextile in a trench to form a cutoff at regular intervals down the slope will prevent erosion under the fabric. Place cutoffs more closely together in highly erodible soils and wider apart in more stable soils.

Subsurface drains – Class III as indicated in Tables 1 and 2.

The geotextile shall not be placed until drainfill or other material can be used to provide cover within the same working day. Drainfill material shall be placed in a manner that prevents damage to the geotextile. In no case shall material be dropped on uncovered geotextile from a height of more than 5 feet.

Iowa

Road stabilization – Class IV as indicated in Tables 1 and 2.

The geotextile shall be unrolled in a direction parallel to the roadway centerline in a loose manner permitting conformation to the surface irregularities when the roadway fill material is placed on its surface. In no case shall material be dropped on uncovered geotextile from a height of more than 5 feet. Unless otherwise specified, the minimum overlap of geotextile panels joined without sewing shall be 24 inches. The geotextile may be temporarily secured with pins recommended or provided by the manufacturer, but they shall be removed before the permanent covering material is placed.

6. SPECIAL SPECIFICATIONS

Property	Test Method	Class I	Class II	Class III	Class IV
Grab tensile strength (pounds)	ASTM D4632	247 minimum	180 minimum	180 minimum	315 minimum
Elongation at failure (%)	ASTM D4632	< 50	< 50	< 50	< 50
Trapezoidal tear strength (pounds)	ASTM D4533	90 minimum	67 minimum	67 minimum	112 minimum
Puncture strength (pounds)	ASTM D6241	495 minimum	371 minimum	371 minimum	618 minimum
Ultraviolet light (% retained strength)	ASTM D4355	50 minimum	50 minimum	50 minimum	70 minimum
Permittivity (sec ⁻¹)	ASTM D4491		as s	specified	
Apparent opening size (AOS) ^{2/2}	ASTM D4751		as 9	pecified	
Percent open area (POA) (%)	USACE 3/CWO-02215-86		as s	pecified	

TABLE 1. REQUIREMENTS FOR WOVEN GEOTEXTILES $^{\rm U}$

All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.
Maximum average roll value.
Note: CWO is a USACE reference.

Iowa

IA-95-4

Property	Test Method	Class I ^{2/}	Class II ^{2/}	Class III ^{2/}	Class IV ^{2/}
Grab tensile strength (pounds)	ASTM D4632 grab test	202 minimum	157 minimum	112 minimum	202 minimum
Elongation at failure (%)	ASTM D4632	50 minimum	50 minimum	50 minimum	50 minimum
Trapezoidal tear strength (pounds)	ASTM D4533	79 muminim	56 minimum	40 minimum	79 minimum
Puncture strength (pounds)	ASTM D6241	433 minimum	309 minimum	223 minimum	433 minimum
Ultraviolet light (retained strength) (%)	ASTM D4355	50 minimum	50 minimum	50 minimum	50 minimum
Permittivity (sec ⁻¹)	ASTM D4491		0.70 minimum	or as specified	
Apparent opening size (AOS) (mm) ^{3/}	ASTM D4751		0.22 maximum	or as specified	

TABLE 2. REQUIREMENTS FOR NONWOVEN GEOTEXTILES ^{1/}

1/ All values are minimum average roll values (MARV) in the weakest principal direction, unless otherwise noted.

2/ Needle punched geotextiles may be used for all classes. Heat-bonded or resin-bonded geotextiles may be used for class IV only.3/ Maximum average roll value.

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-412 GRASSED WATERWAYS

1. SCOPE

The work consists of all excavations, shaping, grading, and earthfill required to construct the waterways as shown on the drawings or as staked in the field. It is the land user's responsibility to locate any existing tile that may be under, along, or crossing the waterways prior to construction. The NRCS is not responsible for any tile damaged during construction.

2. MATERIALS

The earth materials used in constructing the earthfill portions of the waterways shall be suitable material obtained from the waterway channel or other approved sources. The fill material shall be free from brush, roots, frozen material, sod, stones over 6 inches in diameter, or other objectionable material.

3. FOUNDATION PREPARATION

All trees, stumps, brush and debris shall be removed from the site and disposed of so that they will not interfere with construction or proper functioning of the waterway. In fill sections, trees and stumps may be sawed off at a height not exceeding 6 inches above natural ground, provided that the final grade is four feet or more above the top of the stumps.

4. PLACEMENT

Fill will not be placed until the required foundation preparation is complete. Smooth surfaces where fill material is to be placed shall be scarified to insure bonding. Fill shall not be placed upon a frozen surface.

Fill will be placed in approximately uniform horizontal layers of not more than 9 inches in thickness. The moisture content of the material shall be sufficient to obtain firm and suitable compaction. Compaction shall be obtained by routing the hauling and spreading equipment over the fill in such a manner that the entire surface of each layer will be traversed by not less than one tread track of the loaded equipment, or equivalent methods approved by the inspector.

5. EXCAVATION

Excavation shall be to the lines and grades shown on the drawings or staked in the field. All surplus and unsuitable excavated materials will be disposed of at locations shown on the drawings or at locations approved by the inspector. Spoil shall not be placed where it will block the flow of water into the waterway, except as shown on the plan for the construction of temporary diversions.

Where infertile subsoil will be exposed by construction operations, topsoil shall be stripped, stockpiled, and spread on infertile areas after excavation is completed. Areas to be topsoiled shall be undercut so that the finished surface is a design grade after topsoiling is complete.

The area adjacent to the upper end of the waterway shall be graded to divert upper watershed flows into the newly constructed waterway. The outlet end of the waterway shall be left in a stable condition after construction is complete.

6. **DIVERSIONS**

Temporary or permanent diversions shall be constructed as shown on the plans or staked in the field.

Temporary diversions constructed around the top and sides of the waterway to divert runoff water from the new grass seeding shall be removed following seeding establishment. Spoil from this operation shall not permanently block runoff from adjacent land from entering the waterway and may be placed to help ensure runoff enters the waterway in the future.

7. TOLERANCES

The waterway shall be constructed to the specified width, depth, and grade. The constructed waterway shall present a workmanlike finish with uniform grades and cross sections.

The quarter points of a parabolic waterway shall be constructed to the required elevation plus or minus 10% of the depth. For example, if the waterway has a depth of 1.0 ft., the tolerance is plus or minus 0.1 ft.

The side slopes of a trapezoidal waterway shall be constructed to the required slope plus or minus 10% of the slope when expressed as a ration xH:1V. For example, if the required side slope is 8H:1V, the tolerance is plus or minus 0.8 and the constructed side slope shall be in the range of 7.2H:1V to 8.8H:1V.

Depth shall be measured at one-half the design width from the centerline at the lowest side of the waterway.

In addition to the tolerances stated above, Case 1 shall apply unless Case 2 is specified in Section 9, Additional Requirements. In all cases, no flat or reverse grades will be allowed.

Case 1: The center of parabolic waterways and the bottom of trapezoidal waterways shall be constructed to the required elevations with allowable tolerances as follows:

- For waterway slopes 1.5% or less: plus or minus 0.1 ft.
- For waterway slopes greater than 1.5%: plus or minus 0.2 ft.

Case 2 (Applies only to waterways with grades over 1.5%): Each reach of the grassed waterway shall be constructed to the specified depth and grade, with allowable tolerances as follows:

- The constructed depth plus or minus 0.2 ft.
- The constructed grade plus or minus 10% of the design grade. For example, if the waterway reach has a design grade of 3%, the tolerance is plus or minus 0.3% and the constructed grade shall be within the range of 2.7-3.3%.

8. SEEDING

A protective cover of vegetation shall be established on all surfaces of the areas disturbed by construction as shown on the plans or staked in the field. Seeding and mulching shall be performed in accordance with the IA-CPA-4, Seeding Plan, and Construction Specification IA-6, Seeding and Mulching for Protective Cover.

9. ADDITIONAL REQUIREMENTS

NATURAL RESOURCES CONSERVATION SERVICE CONSTRUCTION SPECIFICATION

IA-605 DENITRIFYING BIOREACTOR

1. SCOPE

The work consists of constructing a denitrifying bioreactor as required by the construction plans.

2. UTILITIES

The contractor is responsible for calling Iowa One Call at least 48 hours prior to beginning any excavation work. The landowner is responsible for locating other infrastructure such as tile lines and structures. The landowner will obtain all necessary permissions from regulatory agencies, or document that no permits are required.

3. GENERAL

Carry out construction operations in a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

The completed job must present a workmanlike appearance and conform to the line, grades, and elevations shown on the drawings or as staked in the field.

Carry out all operations in a safe and skillful manner. Observe safety and health regulations and use appropriate safety measures.

Save documentation of materials used (geotextile tags, seed tags, photographs of pipe labeling, etc.) and provide to NRCS.

All trees, stumps, brush, and debris shall be removed from the site and disposed of so they will not interfere with construction or proper functioning of the structure.

4. EXCAVATION

Unless otherwise specified, excavation for and subsequent installation of the pipe and structures shall begin at the outlet end and progress upstream.

Excess spoil material must be placed, spread, leveled, shaped, or hauled away as shown on the construction plans or as staked in the field. Finish the completed job to a degree so the surface can be traveled with farm-type equipment unless otherwise specified in the construction plans.

All excavations must conform to the lines, grades, elevations, bottom width, and side slopes shown on the construction plans or as staked in the field.

Trench shields, shoring, bracing, or other methods necessary to safeguard the workers and prevent damage to the existing improvements shall be furnished, placed, and subsequently removed by the contractor. Occupational Safety and Health Administration (OSHA) requirements relating to trench safety shall be followed.

5. MEDIA CHAMBER

Line the bottom and sides of the media chamber with plastic as shown on the construction drawings. If the bioreactor is located in glacial till soil and has a Unified Soil Classification System designation of CL or CH, the drawings may show that the chamber sides and bottom do not need to be lined. However, if sand is encountered when excavating the chamber, a plastic liner is required. Plastic must have a minimum thickness of 4 mil.

If a soil cap is to be constructed over the top of the chamber, use geotextile to separate the media from the soil. Geotextile must be non-woven, class II, and meet the requirements of Iowa Construction Specification IA-95, Geotextile.

Carbon source media must meet the following requirements:

- 1. Wood material shall be chipped, not shredded. The chips shall be well-graded with at least 80% in the 1-2" range by weight.
- 2. Wood chips shall be less than 120 days old. Decomposed or partially decomposed wood chips shall not be used.
- 3. Wood chips shall be free from objectionable material such as dirt, fines, stones, leaves, long stringy material, etc.
- 4. Wood must not be treated for ground contact.
- 5. Wood made from high tannin content species such as oak, cedar, or redwood is to be avoided. NRCS will reject any proposed wood chips with more than trace amounts of the high tannin content materials. The contractor is advised to check with NRCS in advance for acceptance of the media to be used in the bioreactor.

Spread the media evenly around the chamber. There must be no air pockets, bridging, or uneven surface of the media. Media must be placed in a manner that avoids damage to the distribution and collection pipes in the chamber.

Mound the top surface of the media chamber with the material specified in the plans to allow for settlement of the media and to shed water. The center of the trench should be mounded as shown on the plans but no less than 10% of the total depth of the media material.

6. WATER CONTROL STRUCTURE AND PIPE

The materials and manufacture of the water control structure, pipe, anti-seep collars, coupling bands, coatings, and other appurtenances must be as shown on the construction drawings and conform to materials and applicable reference specifications as shown in Iowa Construction Specification IA-620, Underground Outlet.

Place the water control structure and pipe couplers on a stable base. The stable base may be compacted earth, compacted sand, or a concrete pad. Extend the stable base no less than 1 foot around the structure.

Install the structure with all stop boards in their tracks. Place impervious backfill material around the structure and appurtenances by hand and in layers not more than 6 inches thick before compaction. Thoroughly compact each layer, by means of hand tamping, to the same density as the surrounding materials. Increase the height of fill at approximately the same rate on all sides of the structure.

Lay the pipe to the lines, grades, and elevations shown on the drawings. Bed the pipe firmly and uniformly throughout its entire length. Use hand tamping methods around pipes that are within 20 feet of the water control structure. Beyond that distance, the pipe may be laid with a tile plow or trencher designed for proper bedding of the pipe, and the disturbed soil allowed to naturally subside back into place.

7. OUTLET

Where the construction plans call for a free outlet, use a continuous section of non-perforated conduit at the outlet, unless a headwall is used. All outlets must have an animal guard, installed to allow passage of debris.

The continuous section of non-perforated conduit must be long enough to satisfy all requirements of Conservation Practice Standard 606 – Subsurface Drain:

- At least two-thirds of the pipe must be buried in the ditch bank.
- The cantilever section must extend to the toe of the ditch side slope or to the side slope protected from erosion.
- The continuous section must be at least 20 feet long.

Acceptable materials for use at the outlet include the following:

- Corrugated metal pipe, galvanized or aluminum, 16-gauge, minimum thickness,
- Smooth steel pipe with 3/16 of an inch minimum thickness,
- Smooth plastic pipe, polyvinyl chloride (PVC), with a SDR of 35 or less or schedule 40 or heavier, and
- Dual wall corrugated polyethylene pipe.

All plastic and polyethylene pipe outlets must include an ultra-violet stabilizer.

8. VEGETATION

A protective cover of vegetation shall be established on all surfaces of the areas disturbed by construction. Seeding and mulching shall be performed in accordance with the Seeding Plan, IA-CPA-4, and Construction Specification IA-6, Seeding and Mulching for Protective Cover.

Vegetation should be established as soon after construction as possible.

9. SPECIAL SPECIFICATIONS:

0800 SPECIAL PROVISIONS

The Natural Resources Conservation Service (NRCS) Construction Specifications and the Iowa Statewide Urban Design and Specifications (SUDAS) Specification Manual 2022 Edition as amended in these special provisions shall apply to work on this project.

Notes for Information Only:

- A. Plans for the Indian Creek Water Quality Improvements have been prepared by the United State Department of Agriculture (USDA).
- B. The contract documents and general provisions have been developed in accordance with Division 1: General Provisions and Covenants of the SUDAS Standard Specifications.
- C. NRCS specifications shall be used for construction of Item 1 Dike with Shallow Water Excavation treating Day-Lighted Tile and Item 2 – Denitrifying Bioreactor.
- D. SUDAS specifications shall be used for all other bid items.

Measurement and Payment Notes:

Item 1 - Dike and Shallow Water Excavation Treating Day-Lighted Tile

• Contractor may use soil from the Site 2 borrow area to construct the wetland dike. Use of this material must be approved and coordinated with Owner before construction.

Item 3 - Pipe Culvert, Trenched, RCP Class V, 24"

• Contractor shall use Class R-2 Bedding and Class II trench backfill per SUDAS Section 3010 Trench Excavation and Backfill.

Item 4 - Pipe Apron, RCP Class V, 24"

- Contractor shall use Type 2 Apron per SUDAS Figure 4030.222.
- Anchor last three (3) concrete pipe sections and the apron together with two pipe connections per joint. Comply with Iowa DOT Standard Road Plan DR-121.
- Contractor may salvage and reinstall the existing apron guard. If apron guards are missing or damaged, install apron guard in accordance with SUDAS Section 4020 Sewers and Drains and Figure 4030.224.