

Specifications and Bidding Documents

For

STEELE DITCH #23-04 Defiance Township Defiance County, Ohio

Defiance County Commissioners
Defiance County, Ohio

Prepared By:

Defiance Soil and Water Conservation District
06879 Evansport Road · Suite C
Defiance, Ohio 43512

Under The Guidance and Direction Of:

USDA Natural Resources Conservation Service

December 2024

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STEELE DITCH #23-04

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Construction Specifications

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BID NOTICE

Sealed proposals will be received by the Board of Defiance County Commissioners, Defiance County, Ohio, for the following improvements:

**Construction of
STEELE DITCH #23-04
Defiance County**

Until **11:00 a.m. (Ohio Time) Monday, February 10, 2025** and then at the Defiance County Commissioners Office the proposals will be publicly opened and read aloud. BIDS may be hand delivered or mailed to the *Defiance Soil and Water Conservation District, 06879 Evansport Road, Suite C, Defiance, Ohio 43512* where they must be received 1 hour prior to the date and time of Bid Opening.

The Bidding Documents, including Drawings and Project Manual with Specifications, are on file at the office of the *Defiance Soil and Water Conservation District* located at *06879 Evansport Road, Suite C, Defiance, Ohio 43512*. A set may be obtained at a cost of \$10.00 from the Defiance SWCD. Checks shall be made payable to: Defiance SWCD. This payment for Drawings and Project Manual is non-refundable. Additional copies (in excess of one) of the Drawings and Project Manual may be purchased at a cost of \$5.00 for Drawings and \$5.00 for Project Manual. No refund will be allowed for the return of any additional copies.

Each BID must be submitted in a sealed envelope. Each sealed envelope containing a BID must bear on the outside the name of the BIDDER, his address, his license number, if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the *Defiance Soil and Water Conservation District, 06879 Evansport Road, Suite C, Defiance, Ohio 43512*.

BIDDERS shall use the printed forms provided by the ENGINEER, as none other will be received. The entire bid booklet shall be submitted as one complete unit.

Each bid shall contain the full name and correct address of every person, firm, or company interested in same, and shall be accompanied by a certified check or cashier's check upon a solvent bank in the amount of 10% of the bid or a bond executed by a surety company authorized to do business in Ohio, for a sum equal to the amount of the bid submitted, as a guarantee that if the bid is accepted, a contract will be entered into and its performance properly secured.

The Board of Defiance County Commissioners does not discriminate on the basis of race, color, national origin, sex, religion, age, or disability in employment or the provision of services. The BIDDER (Proposer) must supply all the information required by the bid or proposal form.

Engineer Estimate: \$52,134.00
Completion Date: September 1, 2025

The Board of County Commissioners of Defiance County reserves the right to reject any or all bids.

Liz Stuart, Clerk
Board of County Commissioners

Project Info Available Online at: <https://www.defianceswcd.org/cwi-project-bidding.html>

INFORMATION FOR BIDDERS

GENERAL INFORMATION

It is the intent of these **Contract Documents** to serve as the basis for preparing a contractor's estimate of cost, or the contractor's bid; to show engineering intent and to set a level of equality of workmanship and performance; and as the basis for the written contract or agreement between the Board of County Commissioners from Defiance County (hereinafter called "OWNER") and CONTRACTOR.

They represent the composite of the requirements of the ENGINEER, the OWNER, and any and all funding agencies. An effort has been made, insofar as is practicable, to minimize any duplication or conflict in requirements or standards or performance and workmanship. Inasmuch as this is not always possible, there may be contained herein some conflicting requirements or standards. When such is the case, the more stringent requirements shall always govern, unless stated otherwise. Likewise, **Supplemental Provisions** will amend and/or add to the **Standard Provisions** and shall always have precedence over the standard provisions to which they are a supplement.

The ENGINEER is the USDA Natural Resources Conservation Service Engineer or his authorized representatives of the Defiance Soil and Water Conservation District. The Contract will be administered and construction inspected by the *Defiance Soil and Water Conservation District, 06879 Evansport Road, Suite C, Defiance, Ohio 43512 (419) 782-1794.*

A site showing will be held for interested Bidders upon request by contacting the Defiance Soil and Water Conservation District Office.

The ENGINEER, acting as the OWNER'S representative, shall interpret the intent of the **Contract Documents** in a fair and unbiased manner and shall decide any and all questions which may arise as to quality and acceptability of materials furnished and work performed.

The BIDDER is expected to carefully examine the site of the proposed work, the proposal, plans, specifications, and contract forms and to be thoroughly familiar with them. He shall satisfy himself as to character, quality, and quantities of work to be performed, materials to be furnished, and as the requirements of the proposed contract. The submission of a proposal shall be prima fascia evidence that the BIDDER has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the proposed contract, plans, and specifications.

The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to his BID.

The OWNER may make such investigations as he deems necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the *Agreement* and to complete the WORK contemplated therein.

INFORMATION FOR BIDDERS (continued)

The low BIDDER must supply the names and addresses of major material suppliers and subcontractors when requested to do so by the OWNER.

Each BIDDER shall, if requested, furnish the OWNER satisfactory evidence of his competency to perform the proposed work. Such evidence of competency unless otherwise specified, shall consist of statements covering the BIDDER'S past experience or similar work, a list of equipment that would be available for the work, and the list of key personnel that would be available. In addition, each BIDDER shall, if requested, furnish the OWNER satisfactory evidence of his financial responsibility. Such evidence of financial responsibility shall consist of a confidential statement or report of the BIDDER'S financial resources and liabilities as of the last calendar year or the CONTRACTOR'S last fiscal year. Such statement, or reports, shall be certified by a public accountant. Such statement shall also indicate whether the CONTRACTOR'S financial responsibility is approximately the same as stated; and if it has changed; the BIDDER shall qualify the statement or report to reflect his true financial condition at the time of submitting the proposal.

In lieu of the above mentioned statement of financial responsibility, the BIDDER may submit evidence that he is pre-qualified with the State Highway Division and is on the current "*Bidder's List*" of the state in which the proposed work is located.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout.

BOND INFORMATION

Each BID must be accompanied by a *Bid Bond* or BID GUARANTY AND CONTRACT BOND, payable to the OWNER, executed by a surety company authorized to do business in Ohio, for a sum equal to the amount of the bid submitted or a certified check or cashier's check upon a solvent bank in the amount of 10% of the bid. As soon as the BID prices have been compared, the OWNER will return the bonds of all except the three lowest responsible BIDDERS. When the *Agreement* is executed, the bonds of the two remaining unsuccessful BIDDERS will be returned. The *Bid Bond* of the successful BIDDER will be retained until the *Payment Bond* and the *Performance Bond* have been executed and approved, after which it will be returned, unless the Bond submitted is a BID GUARANTY AND CONTRACT BOND in which case this will be held until the project is satisfactorily completed. A certified check may be used in lieu of a *Bid Bond*.

A BID GUARANTY AND CONTRACT BOND or a *Performance Bond* and a *Payment Bond* each in the amount of 100% of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign any of the *Bonds* must file with each bond a certified and effective dated copy of their *power of attorney*.

The party to whom the contract is awarded will be required to execute the *Agreement* and obtain the *Performance Bond* and *Payment Bond* (unless a BID GUARANTY AND CONTRACT BOND was submitted with the BID) within 10 calendar days from the date when *Notice of Award* is delivered to the BIDDER. The *Notice of Award* shall be accompanied by the necessary *Agreement*

INFORMATION FOR BIDDERS **(continued)**

and bond forms. In case of failure of the BIDDER in default, in which case the BID bond accompanying the proposal shall become the property of the OWNER.

The OWNER within 10 days of receipt of acceptable *Performance Bond, Payment Bond, and Agreement* signed by the party to whom the *Agreement* was awarded shall sign the *Agreement* and return to such party an executed duplicate of the *Agreement*. Should the OWNER not execute the *Agreement* within such period, the BIDDER may by written notice withdraw his signed *Agreement*. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

PAYMENT INFORMATION

Partial payments to the CONTRACTOR for labor performed under either a unit or lump sum price contract shall be made at the rate of ninety-two percent of the estimates prepared by the CONTRACTOR and approved by the ENGINEER. All labor performed after the job is fifty percent completed shall be paid for at the rate of one hundred percent of the estimates submitted by the CONTRACTOR and approved by the ENGINEER.

NOTICE TO PROCEED

The *Notice to Proceed* shall be issued within 10 days of the execution of the *Agreement* and once all contract requirements have been met to the satisfaction of the OWNER. Should there be reasons why the *Notice to Proceed* cannot be issued within such a period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the *Notice to Proceed* has not been issued within the 10 day period or within the period mutually agreed upon, the CONTRACTOR may terminate the *Agreement* without further liability on the part of either party.

Shortly after the contract is awarded, a *Preconstruction Conference* will be held to discuss the scheduling and performance of the work; the successful BIDDER and each of his subcontractors shall attend the conference.

CONSTRUCTION INFORMATION

All work shall be completed in accordance with the plans, specifications and as directed by the ENGINEER. Where applicable, all work shall be in accordance with United States Department of Agriculture, Natural Resources Conservation Service (NRCS), National Engineering Handbook, Section 20; "Specifications for Construction".

SAFETY

The CONTRACTOR shall provide such safety measures to protect public health and welfare, as provided in the pertinent codes of the State of Ohio. The CONTRACTOR shall be held liable for all damages resulting from the use of mechanical equipment, or other devices used in the execution of the work, as well as damages caused by fires which may be set as a result of faulty equipment, or the unnecessary damage to crops, land, or improvements. The CONTRACTOR shall be responsible for all roads and other crossings and for obtaining any necessary permits.

PERMITS

It is the responsibility of the CONTRACTOR to secure all permits required in order to complete this project.

INFORMATION FOR BIDDERS
(continued)

EQUIPMENT

Equipment used for this project shall consist of hydraulic excavator, bulldozer, tractor backhoe, dump truck, tractor with tillage equipment for final grading and/or any other piece of machinery, capable of doing the same work in a manner that will minimize soil, water and other resource disturbances. Any other machinery to be used must first be approved by the ENGINEER, prior to beginning any construction.

Measures and construction methods that enhance fish and wildlife values shall be incorporated as needed and practical. Special attention shall be given to visual resources, protecting and maintaining key shade, food and den trees, where practical, and the stabilization of disturbed areas as soon as possible when construction is completed.

The contractor shall use reasonable care to avoid damage to all outlet pipes. If an outlet pipe is damaged due to negligence from the contractor, the pipe shall be replaced at the contractor's expense.

BEGINNING CONSTRUCTION

The CONTRACTOR shall notify the ENGINEER seven (7) days prior to the time he wishes to start work. Failure to do so will result in a possible delay to the Contractor, at the Engineer's discretion.

WORK SCHEDULE and HOURS

The work schedule for this project shall be Monday through Friday with no work to be done on Saturdays unless authorized by the ENGINEER. No work shall be done on Sundays or Holidays.

The CONTRACTOR shall notify the ENGINEER at least one (1) day in advance of any day or days he does not intend to work on the project. This does not apply to Saturdays, Sundays or Holidays.

Work hours shall be as agreed upon by the ENGINEER and CONTRACTOR. The preferred work hour schedule shall be set before construction begins.

The Engineer reserves the right to declare non-work days due to high water or wet ground conditions. These days shall be credited to the contract by extending the ORIGINAL COMPLETION DATE by the total number of non-work days.

UTILITY NOTIFICATION

The CONTRACTOR shall comply with all laws and rules and assume full responsibility for notifying all utility companies that have equipment such as telephone poles, power poles, underground cables, water lines, gas lines or any other equipment or facilities within the work limits of the project.

The CONTRACTOR shall notify the OHIO811, formerly the Ohio Utilities Protection Service (O.U.P.S.), at 1-800-362-2764 as to the time he plans to begin work on the project and at least 48 hours prior to commencing work in the immediate vicinity of a particular installation.

If possible, the CONTRACTOR shall change his method of operation and equipment at these places so as not to cause any damages to said utility installations.

INFORMATION FOR BIDDERS
(continued)

ROAD RIGHT-OF-WAY

The CONTRACTOR shall notify the Ohio Department of Transportation, Defiance County Engineer, and Townships when conducting operations within their right-of-way limits at least forty-eight (48) hours in advance of commencement of work.

No excavated materials or debris removed shall be deposited on road right-of-way and no vehicles or equipment shall be permitted to perform work while on the pavement or berm.

It will be the responsibility of the CONTRACTOR to establish the location of right-of-way lines and to secure all necessary permits required for use or occupation of said right-of-way.

TEMPORARY EASEMENTS FOR CONSTRUCTION PURPOSES

Refer to the Engineering Drawings for the exact work limits on the project. If additional work area is needed, the CONTRACTOR shall notify the ENGINEER and the final decision will be made by the ENGINEER.

Access points will be from roadways and within the work limits. Any deviance from these access locations shall be approved by the ENGINEER prior to entrance on the property.

CLEANUP WORK

During construction the CONTRACTOR shall keep the work site, areas adjacent to the work site and access roads in an orderly condition, free and clear from debris, mud and discarded materials. Care should be taken to prevent spillage when hauling is done or equipment moved down the roadway. Any spillage or debris resulting from the Contractor's operations shall be immediately removed.

Upon completion of the work, the CONTRACTOR shall remove from the work site, areas adjacent to the work site and access roads, material belonging to them or used under their direction during the construction. They shall grade all access roads, other than public roadways, removing wheel tracks and smoothing up such roads.

PREVAILING WAGE RATES

All employees on the Work site shall be paid at the prevailing wage rate for the appropriate class of Work. The prevailing wage rates shall be determined in accordance with ORC Chapter 4115, except for employees who are covered by a collective bargaining agreement in existence prior to the date of contract, who shall be paid the rate of pay provided by such agreements. Schedules of applicable prevailing wage rates are attached to the Specifications. Bidders are cautioned to assure the completeness of said wage schedules, and to notify the County Engineer prior to the bid date of any omitted schedules.

PREVAILING WAGE RATE SCHEDULES

PN060-PROJECTS WITH NO FEDERAL AID

The following is in addition to Section 108.10

This contract is subject to Ohio Prevailing Wage Laws, Chapter 4115 of the Ohio Revised Code and the Contractor and all subcontractors shall comply with all provisions contained therein or as otherwise provided by this note. The Contractor guarantees that the prevailing wage scale to be paid to all laborers and mechanics employed on this contract shall be in accordance with the schedule of the prevailing hourly wage and fringe benefits as determined by the Ohio Department of Commerce for the county in which the work is being performed. The failure to pay prevailing wages to all laborers and mechanics employed on this project shall be considered a breach of contract. Such a failure may result in the revocation of the contractor's and/or subcontractor's certificate of qualification and debarment. A schedule of the most current prevailing wage rates may be accessed by registering with the Ohio Department of Commerce, Labor and Worker Safety Division, Wage and Hour Bureau at the following web address:

<http://198.234.41.198/w3/webwh.nsf?Opendatabase>

The Contractor and all subcontractors shall compensate the employees on this contract at a pay rate not less than the hourly wage and fringe rate listed on the website noted above, for the applicable job classification or as modified by the Ohio Department of Commerce, Division of Labor and Worker Safety Wage and Hour Bureau, when new prevailing rates are established.

Overtime shall be paid at one and one-half times the basic hourly rate for any hours worked beyond forty (40) hours during a pay week. The Contractor and all subcontractors shall pay all compensation by company check to the worker and fringe benefit program.

The wage and fringe rates determined for this project or as may be later modified, shall be posted by the Contractor in a prominent and accessible place on the project, field office, or equipment yard where they can be easily read by the workers or otherwise made available to the workers. On the first pay date of contract work the Contractor and all subcontractors shall furnish each employee covered by prevailing wage a completed form whpw1512 in accordance with section 4115.05 Ohio Revised Code, showing the classification, hourly pay rate, fringes, and identifying the District Prevailing Wage Coordinator (DPWC), if such employees are not covered by a collective bargaining agreement or understanding between employers and bona fide organizations of labor. These forms shall be signed by the Contractor or subcontractor and the employee and kept in the Contractor's or subcontractor's payroll files.

PREVAILING WAGE RATE SCHEDULES (continued)

The Contractor and all subcontractors shall submit to the DPWC or other designated Department representative, certified payrolls on form whpw1509 or equivalent, in accordance with sections 4115.07 and 4115.071(C) of the Ohio Revised Code, three weeks after the start of work and every subsequent week until the completion of the contract. Additionally, a copy of the “Apprentice Certification” obtained from the USDOL, Bureau of Apprenticeship and Training, must accompany, the first certified payroll submitted, for all apprentices working on this project. Upon completion of the contract and before the final payment, the Contractor shall submit to the DPWC a final wage affidavit in accordance with section 4115.07 of the Ohio Revised Code stating that wages have been paid in conformance with the minimum rates set forth in the contract. Please be aware that it is ultimately the responsibility of the prime Contractor to ensure that all laws relating to prevailing wages in Chapter 4115 of the Ohio Revised Code, are strictly adhered to by all subcontractors.

The Contractor and all subcontractors shall make all of its payroll records available for inspection, copying or transcription by any authorized representative of the contracting agency. Additionally, the Contractor and all subcontractors shall permit such representatives to interview any employees during working hours while the employee is on the job.

If the Contractor or any subcontractor fails to comply with any of the provisions contained in this proposal note, the Department may terminate the contract, debar the Contractor or subcontractor and/or withhold or suspend pay estimates after written notice and a reasonable opportunity to comply has been provided.

BID

Proposal of _____
(hereinafter called "BIDDER"), organized and existing under the laws of the State of Ohio doing business as * (insert "A Corporation", "A Partnership", or "An Individual" as applicable)

To the Board of County Commissioners of Defiance County (hereinafter called "OWNER"). In compliance with your *Invitation to Bid*, BIDDER hereby proposes to perform all WORK for the reconstruction of **STEELE DITCH #23-04** Defiance County, Ohio, in strict accordance with the **Contract Documents**, within the time set forth therein, and at the prices stated in the bid.

It is understood that separate sealed BIDS will be received by the Board of Defiance County Commissioners until **11:00 a.m. (Ohio Time) Monday, February 11, 2025** and then at the Defiance County Commissioners' Office, they shall be opened and read aloud.

All BIDS must be made on the required BID form provided in the **Specifications and Bidding Documents**. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required, and must be submitted complete with no pages detached.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period; the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

Should there be any discrepancy discovered between the intentions of these specifications and the special plans prepared for the contract, the ENGINEER shall be the deciding authority, and his decision shall be final. The right is reserved by the ENGINEER to correct any error or omissions in the plans or specifications. The CONTRACTOR shall be paid for extra work on unit bid price. The right is also reserved for non-performance and shall be deducted from the contract at unit price.

The **Contract Documents** contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the CONTRACT.

A conditional or qualified BID will not be accepted. Award will be made as a whole to one BIDDER.

BID
(Page 2 of 9)

It is understood that the *Invitation to Bid, Information for Bidders, Plans, and Specifications* are considered as part of this BID as if herein set out verbatim, or if not attached, as if hereto attached. By submission of this BID, each BIDDER certified as to his own organization that his BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or any competitor.

Engineers cost estimate for the project is **\$52,134.00**

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in the *Notice to Proceed* and to complete the project by **September 1, 2025**.

BIDDER further agrees to pay as liquidated damages, the sum of **\$500** for each consecutive calendar day thereafter.

Accompanying this BID is a certified check or *Bid Bond* or BID GUARANTY AND CONTRACT BOND in the amount of \$ _____ payable to Board of Defiance County Commissioners which shall be retained as liquidation damages by the OWNER if the undersigned fails to execute the contract in conformity with the provisions of these **Contract Documents** within 10 days after receipt of *Notice of Award of Contract* to the undersigned. In case of alternate bids, only one *Bid Bond* or certified check will be required provided the same is in the amount equal to the highest gross price bid if a *Bid Bond* or 10% of the highest gross price bid if a certified check.

BIDDER acknowledges receipt of the following ADDENDUM:

Estimated quantities given, which require a unit price, are for the purpose of competitive bidding and are not necessarily the final pay quantities. Final field measurements and calculations shall determine the final quantity to be paid.

Where an error in extension occurs, the unit price bid will be accepted by the Board of Defiance County Commissioners.

BIDDER agrees to perform all the work described in the **Contract Document** for the following prices or lump sum prices.

BID
(Page 3 of 9)

Bid Item	Work or Materials	Specification Number	Estimated Quantity	Unit	Unit Price	Amount
1	Clearing and Grubbing Clear, grub, and pile all trees and brush from the ditch bottom and banks as described in Construction Specifications and in the Engineering Drawings.	2	1 Acre	Lump	Lump	
				Bid Item 1 Total		
2	Common Excavating, Leveling and Hauling Refer to Construction Specifications and Engineering Drawings for more details. Labor to excavate and level approx. 500 Cu. Yds. and labor to excavate and haul approx. 1,500 Cu. Yds. Sta. 3+93 to 21+36	21	2,000 Cu. Yds.	Lump	Lump	
				Bid Item 2 Total		
3	Seed, Fertilize & Mulch Ditch Banks Refer to Construction Specifications and Engineering Drawings for more details. (Daily Seeding and Fertilizing Required)	6	0.63 Acres	Lump	Lump	
				Bid Item 3 Total		
4	Seed, Fertilize & Mulch 10' Berm Refer to Construction Specifications and Engineering Drawings for more details.	6	0.79 Acres	Lump	Lump	
				Bid Item 4 Total		
5	4" Tile Outlet Replacements Refer to Construction Specifications and Engineering Drawings for more details. Labor and material required to install outlet tile, animal guard and outlet riprap as needed. 4" Tile Outlet	44, 61, 523, 548	5	Each		
				Bid Item 5 Total		
6	30' of 30" Culvert Install Refer to Construction Specifications and Engineering Drawings for more details. Labor and material required to install outlet culvert. 30"	21, 44, 61, 523, 548	1	Lump	Lump	
				Bid Item 6 Total		

BID
(Page 4 of 9)

Bid Item	Work or Materials	Specification Number	Estimated Quantity	Unit	Unit Price	Amount
7	Road Ditch / Access Culvert Refer to Construction Specifications and Engineering Drawings for more details. Labor and material required to install access culverts with stone bedding and backfill. 21+36 Right Side 30' of 12" CPTS	44, 61, 523, 548	1	Lump	Lump	
				Bid Item 7 Total		
8	Mini-Rock Chute Installation Refer to Construction Specifications and Engineering Drawings for more details. Install riprap where surface water enters the ditch. Average of 8.5 Ton ODOT Type "C" and "D" Riprap Per Structure	61, 95, 523, 592	11	Each		
				Bid Item 8 Total		
9	Rock Pad Refer to Construction Specifications and Engineering Drawings for more details. Labor and material required to install rock pad at stations 21+28 to 21+36 with ODOT Type "D" riprap. Approx. 22 Ton ODOT Type "C" and "D" Riprap Approx. 7.4 Ton #57 or #67 Stone Bedding	61, 523		Lump	Lump	
				Bid Item 9 Total		
10	Rock Lined Channel Refer to Construction Specifications and Engineering Drawings for more details. Labor and material required to install rock lined channel at stations 14+18 to 14+40 using a mix of ODOT Type "C" and "D" Riprap. Approx. 36.6 Ton ODOT Type "C" and "D" Riprap Approx. 8.1 Ton #57 or #67 Stone Bedding	61, 523		Lump	Lump	
				Bid Item 10 Total		
				Total Bid		

BID
(Page 5 of 9)

<u>PLEASE PROVIDE A PRICE FOR EACH OF THE FOLLOWING</u>	
<u>Seeding Less Straw Mulch</u>	<u>Cost/Acre</u>
Ditch Bank	_____
10' Ditch Berm	_____

<u>PLEASE PROVIDE A PRICE FOR EACH OF THE FOLLOWING</u>			
<u>Tile Outlet</u>	<u>Each</u>	<u>Tile Outlet Riprap</u>	<u>Each</u>
6" Outlet	_____	10" Outlet Riprap	_____
8" Outlet	_____	15" Outlet Riprap	_____
10" Outlet	_____	18" Outlet Riprap	_____
15" Outlet	_____	24" Outlet Riprap	_____
18" Outlet	_____		

<u>PLEASE PROVIDE AN HOURLY RATE FOR THE FOLLOWING EQUIPMENT</u>			
<u>Equipment</u>	<u>Hourly Rate</u>	<u>Equipment</u>	<u>Hourly Rate</u>
Excavator:		Tractor/Backhoe	_____
a. Small	_____	Dump Truck	_____
b. Large	_____	Bulldozer	_____
c. Other	_____	a. Small	_____
Labor	_____	b. Large	_____
		c. Other	_____

Include operator when giving Hourly Rate for each piece of equipment.

BID
(Page 9 of 9)

Name, Address, and Zip Code of BIDDER (Industrial, Partnership, or Corporation):

Telephone Number and Area Code of BIDDER: _____

The information contained in this *Bid* is accurate and complete. I am authorized to sign this *Bid* and any subsequent contracts in the name of the BIDDER listed above.

Signed: _____

Title: _____

BID GUARANTY AND CONTRACT BOND
(Section 153.571 Ohio Revised Code)

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____

(Name and Address) as

Principal, and _____ (Name) as Sureties, are

hereby held and firmly bound unto the BOARD OF DEFIANCE COUNTY COMMISSIONERS,

hereinafter called the Obligee, in the penal sum of the dollar amount of

the bid submitted by the Principal to the OWNER on _____

_____ to undertake the project known as:

STEELE DITCH #23-04

The penal sum referred to herein shall be the dollar amount of the principal's bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of: _____ dollars (\$_____). (If the foregoing blank is not filled in, the penal sum will be full amount of the principal's bid, including alternates. Alternatively, if the blank is filled in, the amount stated must not be less than the full amount of the bid including alternates, in dollars and cents. A percentage is not acceptable.) For the payment of the penal sum will and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above-named principal has submitted a bid on the above referred to project: **STEELE DITCH #23-04**.

Now, therefore, if the Obligee accepts the bid of the principal and the principal fails to enter into a proper contract in accordance with the bid, plans, detailed, specifications, and bills of material; and in the event the principal pays to the Obligee the difference not to exceed 10% of the penalty hereof between the amount specified in the bid and such larger amount for which the Obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the Obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the principal pays to the Obligee the difference not to exceed 10% of the penalty hereof between the amount specified in the bid, or the costs, in connecting with the resubmission, or printing, new contract document, required advertising, and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect; if the Obligee accepts the bid of the principal and the principal within 10 days after the awarding of the contract enters into a proper contract in accordance with the bid, plans, details, specifications, and bills of material, which a contract is made a part of this bond the same as though set forth herein.

**GUARANTY AND CONTRACT BOND
(Continued)**

Now also, if the said principal shall well and faithfully do and perform the things agreed to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialman, and laborers, for labor performed and material furnished in the carrying forward, performing, or completing of said contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect it being expressly understood and agreed that the liability of the surety of any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

The above Surety hereby certifies that it is authorized by the superintendent of insurance, State of Ohio, to execute the above bond and that the liability incurred is within the limits prescribed by Section 3929.121 of the Ohio Revised Code.

The said surety hereby stipulates and agrees that no modification, omissions, or additions, in or to the terms of the said contract or in or to the plans or specifications therefore shall in any way affect the obligation of said surety on its bond and does hereby waive notice of any such modifications, omissions, or additions to the terms of the contract or in or to the plans and specifications.

SIGNED AND SEALED THIS _____ day of _____, 20____.

Principal:

By: _____

Title: _____

Surety:

Surety Company Address:

By: _____

Attorney-in-fact

Surety Agent's Address:

EQUAL EMPLOYMENT OPPORTUNITY STATEMENT

No discrimination.

In the hiring of employees for the performance to work under this contract or any subcontract, contractor, or any subcontractor shall not by reason of race, color, religion, sex, age, handicap, national origin, or ancestry, discriminate against any citizen of this state in the employment of a person qualified and available to perform work to which the contract relates. Contractor or any subcontractor, or any person acting on behalf of contractor or any subcontractor shall not, in any manner, discriminate against, intimidate, or retaliate against any employee hired for the performance of work under the contract on account of race, color, religion, sex, age, handicap, national origin, or ancestry.

The _____ (Name of Supplier) does not discriminate on the basis of race, color, national origin, sex, religion, age, or disability in employment or the provision of service.

Signature

Title

Date

Sworn to before me and subscribed in my presence this _____ day of _____, 20__.

Notary Public

HOLD HARMLESS CLAUSE

Defiance County, Ohio

Indemnity. To the maximum allowed by law, the contractor shall defend, indemnify and hold harmless the counties and all of the elected and appointed officials, together with all employees and agents to the counties (the “indemnified parties”) from any and all claims, demands, causes of action, judgments, liens, penalties, costs and expenses (including attorney fees and expenses) of any kind including claims for bodily injury, illness or death or property damage or loss of use, which may at any time be imposed upon, incurred by or asserted against an indemnified party as a result of any action of the contractor, its officers, employees, invitees, or agents arising out of or in consequence of this agreement, including: 1.) the performance or non-performance of the work or any obligation under this agreement; 2.) the common law or any legislation, regulation, or order including environmental laws, rules and orders; or 3.) negligence including any passive negligence of an indemnified party. This indemnification shall survive any termination of this agreement and is not limited by the contractor’s insurance coverage. In order to effectuate and facilitate the indemnification of the county, contractor does hereby waive any and all employer immunity provided by the workmen’s compensation law under Section 35, Article II, of the Ohio Constitution. At the option of the county contractor shall further bear all costs and expenses including attorney fees in the defense of any suit arising hereunder. Additionally, contractor shall repair or pay for the repair of any damage to the county’s property caused by the contractor or its officers, employees, invitees, or agents.

Insurance. Contractor at its sole cost and expense shall furnish and keep in full force and effect during the time this contract is in effect sufficient insurance to protect the county from any claim arising from the contractor’s conduct as a result of this agreement, including: worker’s compensation coverage in compliance with state law; comprehensive general and motor vehicle liability insurance (including coverage for owned, non-owned or hired vehicles) with broad form property damage coverage with limits of at least \$_____ for bodily injury or death per occurrence and \$_____ aggregate, \$_____ property damage per occurrence and \$_____ aggregate (or a reasonable equivalent expressly accepted by the county), plus loss insurance for the equipment used. If the above insurance sums are blank, contractor shall provide insurance as specified. Such liability insurance policies shall insure the contractual liability assumed hereunder, shall name the county as an additional insured for all work under this contract, and shall provide that such insurance is primary to any other county liability insurance. Prior to commencing any work contractor shall furnish the county with proof of such insurance with companies acceptable to the counties.

NON-COLLUSION AFFIDAVIT

TO BE EXECUTED BY EACH AWARDEE OF A PRINCIPAL CONTRACT

)
) §
)

_____, being first duly sworn, deposes and says that

he is _____
(sole owner, a partner, president, secretary, etc.)

of _____

the party making the foregoing bid; that such bid is not made in the interest of or on behalf of any undisclosed person, partnership, company association, organization, or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, nor that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of said bidder or of any other bidder, not to fix any overhead, profit, or cost element of such bid price nor of that of any other bidder nor to secure any advantage against the public body awarding the contract or anyone interested in the proposed contract; that all statements contain in such bid are true; and further, that said bidder has not directly or indirectly, submitted his bid price or any breakdown thereof, nor the contents thereof, nor divulged information or data relative thereto, nor paid and will not pay fee in connection therewith to any corporation, partnership, company, association, organizations, bid depository, not to any member or agent thereof, nor to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

Signed: By _____

Title

Subscribed and sworn to before me this _____ day of _____, 20__.

(seal) _____
Notary Public

NON-COLLUSION AFFIDAVIT

TO BE EXECUTED BY EACH "AWARDEE" OF A SUBCONTRACT

)
)§
)

_____, being first duly sworn, deposes and

says that he is _____

(Sole owner, a partner, president, secretary, etc.)

of _____

the party submitting a bid for a subcontract covering _____

(Describe nature of subcontract)

that such bid is not made in the interest of or on behalf of any undisclosed person, partnership, company, association organization, or corporation; that such bid is genuine and not collusive or sham; that said bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived or agreed with any bidder to anyone else to put in a sham bid, nor that anyone shall refrain from bidding; that said bidder has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the bid price of said bidder or of any other advantage against the principal Contractor or anyone interested in the proposed subcontract; that all statements contained in such bid are true; and, further, that said bidder has not directly or indirectly, submitted his bid price or any breakdown therefore, nor the contents thereof, not divulged information or date relative thereto, nor paid and will not pay any fee in connection therewith to any corporation, partnership, company, association, organization, bid depository, nor to any member or agent thereof, nor to any other individual except to such person or persons as have a partnership or other financial interest with said bidder in his general business.

The provisions of this affidavit shall not be held as disqualifying a person, firm, or corporation who has submitted a sub-proposal to one bidder from submitting separate sub-proposals or quoting prices for materials or work to other bidders.

Signed:

By _____

Title

Subscribed and sworn to before me this _____ day of _____, 20____.

(Seal)

Notary Public

RELEASE OF LIENS

To Whom It May Concern:

Please take notice that we, the undersigned laborers, mechanics, contractors, subcontractors, and/or suppliers who have been employed, or who furnished the material on the public contract for the project known as **STEELE DITCH #23-04** and owned by **DEFIANCE COUNTY COMMISSIONERS;** DO CERTIFY, THAT in consideration of amounts paid to us, we, and each of us do hereby release all rights of liens against said project, property, and improvements on said property in favor of the owner, any private individual, bank, or loan association that may have been made, or that may make a loan on said property, and we further state that the Owner of said property has paid us in full up to his date including all State and Federal Tax obligations as per his agreement with us for the construction of the same. We further certify that all our employees, suppliers, subcontractors, agents, etc. have been paid in full for all labor and/or material furnished on said project. If more space is needed for names, please add sheets with same information here as needed.

	Printed Name & Signature of Contractor/Subcontractor/Laborers	Type of Work	Dollar Amount	Date	Phone
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____

To: OWNER

I, THE CONTRACTOR, hereby request and certify unto you that the signatures signed to the above Release of Liens, comprise a true, full and complete list of all businesses and persons who have contracted for or furnished any and all materials, labor, and fixtures of every description for, in or about the erection, construction, repair or improvement on the above project, or who are or have been subcontractors upon said project, or any part thereof, or for furnishing any and all fixtures or improvements to said project under any contract or agreement with the undersigned.

Contractor further states that the matters and things stated herein are, to the best of his knowledge and belief, true.

Dated and signed this _____ day of _____, 20____.

Contractor/Subcontractor/Laborer Signature

NOTARY:

Subscribed and sworn before me this _____ day of _____, 20____.

Notary:
My Commission Expires:

CONTRACT

THIS CONTRACT, made the _____ day of _____, 20____, by and

Between _____ hereinafter call the “Contractor” and the **Board of Defiance County Commissioners** hereinafter called the “Owner”.

WITNESSETH, that the Contractor and the Owner for the consideration stated herein, agree as follows:

ARTICLE I, SCOPE OF WORK: The Contractor shall perform everything required to be performed and shall provide and furnish all of the labor, materials, necessary tools, expendable equipment, and all utility and transportation services required for the **STEELE DITCH #23-04**, all in accordance with the plans and specifications for this project prepared by the USDA Natural Resources Conservation Service and the Defiance Soil and Water Conservation District, referred herein as the “Engineer” which plans and specifications are made a part of this Contract, and in strict compliance with the Contractor’s Proposal and other Contract Documents herein mentioned which are a part of this Contract; and the Contractor shall do everything required by this Contract and the other documents constituting a part hereof.

ARTICLE II, THE CONTRACT PRICE: The Owner shall pay to the Contractor for the performance of this Contract, the contract prices shall be as listed on pages 11 through 18 of this document, not to exceed _____, subject to any approved change orders as provided for in the General Provisions contained in this document.

ARTICLE III, TIME FOR COMPLETION: The Contractor agrees to complete the work included under this Contract by _____.

ARTICLE IV, COMPONENT PARTS OF THIS CONTRACT: This Contract consists of the following component parts, all of which are as fully a part of this Contract as if herein set our verbatim, or if not attached, as if hereto attached: (1)Bid Notice; (2)Information for Bidders; (3)Bid; (4)Bid Guaranty and Contract Bond; (5)This Instrument; (6)Specifications; (7)Plans; (8)Affidavit of Contractor or Supplier of Non-Delinquency of Personal Property Taxes; (9)Final List of Subcontractors; (10)Equal Employment Opportunity Statement; (11)Hold Harmless Clause; (12)Non-Collusion Affidavit; and (13)Release of Liens.

CONTRACT
(Page 2 of 4)

IN WITNESS WHEREOF, the parties to this Contract have hereunto set their hand and seals and have executed this Contract in triplicate, the day and year first above written.

Attest:

BOARD OF DEFIANCE
COUNTY COMMISSIONERS

(as to all)

By _____
Dana Phipps, Board Chairman
Defiance County Commissioner

(as to all)

By _____
Mick Pocratsky, Board Member
Defiance County Commissioner

By _____
David Kern, Board Member
Defiance County Commissioner

CONTRACTOR

By _____

Title _____

APPROVAL OF FORM: This Instrument is approved as to form.

Date: _____

Attorney: _____
Morris J. Murray

CONTRACT
(Page 3 of 4)

COUNTY AUDITOR'S CERTIFICATE

CONTRACT NO. _____
FUND _____
DATE _____

VENDOR NO. _____
VENDOR _____

It is hereby certified that the amount to meet the obligations of this Contract in the fiscal year in which the Contract has been made has been lawfully appropriated for the purposes of the Contract and is in the Defiance County Treasury or in the process of collection to the credit of the _____ Fund free from any previous encumbrances. This Certificate is given in compliance with Sections 5705.41 and 5705.44 of the Ohio Revised Code.

Defiance County Auditor
Designated Fiscal Officer

=====

It is hereby certified that the amount (\$ _____) required to meet the Contract, agreement, obligation, payment, or expenditure for the above, has been lawfully appropriated or authorized or directed for such purpose and is in the Defiance County Treasury or in the process of collection to the credit of the _____ Fund free from any previous encumbrances. This Certificate is given in compliance with Sections 5705.41 and 5705.44 of the Ohio Revised Code.

Defiance County Auditor
Designated Fiscal Officer

=====

It is hereby certified that the amount (\$ _____), for the fiscal year _____ required to meet the Contract, agreement, obligation, payment, or expenditure, for the above, has been lawfully appropriated or authorized or directed for such purpose and is in the Defiance County Treasury free from any previous encumbrances. Outstanding balance of Contract, estimated (\$ _____) to be appropriated for the fiscal year(s) _____. This Certificate is given in compliance with Sections 5705.41 and 5705.44 of the Ohio Revised Code.

Defiance County Auditor
Designated Fiscal Officer

THIS CONTRACT NOT VALID UNLESS COUNTY AUDITOR'S CERTIFICATE IS SIGNED.

CHANGE ORDER

PROJECT TITLE _____

PROJECT NO. _____ CONTRACT NO. _____ CONTRACT DATE _____

CONTRACTOR _____

The following changes are hereby made to the Contract Documents:

Justification:

CHANGE TO CONTRACT PRICE

Original Contract Price \$ _____

Current Contract Price, as adjusted by previous Change Orders \$ _____

The Contract Price due to this Change Order will be (increased) (decreased)
by \$ _____

The new Contract Price due to this Change Order will be \$ _____

CHANGE TO CONTRACT TIME

The Contract Time will be (increased) (decreased) by _____ calendar days.

The date for completion of all work under the contract will be _____

Approvals Required:

To be effective, this order must be approved by the Owner if it changes the scope or objective of the project, or as may otherwise be required under the terms of the Supplementary General Conditions of the Contract.

Requested by _____ Date _____

Recommended by _____ Date _____

Ordered by _____ Date _____

Accepted by _____ Date _____

INDEX OF CONSTRUCTION AND MATERIAL SPECIFICATIONS

<u>CONSTRUCTION SPECIFICATION NUMBER</u>	<u>SPECIFICATION TITLE</u>	<u>MATERIAL SPECIFICATION NUMBER</u>	<u>SPECIFICATION TITLE</u>
2	Clearing & Grubbing	523	Rock for Riprap
6	Seeding, Sprigging, & Mulching	548	Corrugated Polyethylene Tubing
21	Excavation	592	Geotextile
44	Corrugated Polyethylene Tubing		
61	Rock Riprap		
95	Geotextile		

Construction Specification 2—Clearing and Grubbing

1. Scope

The work consists of clearing and grubbing and disposal of trees, snags, logs, brush, stumps, shrubs, and rubbish from the designated areas.

2. Protection of existing vegetation

Trees and other vegetation designated to remain undisturbed shall be protected from damage throughout the duration of the construction period. Any damages resulting from the contractor's operations or neglect shall be repaired by the contractor.

Earthfill, stockpiling of materials, vehicular parking, and excessive foot or vehicular traffic shall not be allowed within the drip line of vegetation designated to remain in place. Vegetation damaged by any of these or similar actions shall be replaced with viable vegetation of the same species, similar condition, and like size unless otherwise approved by the contracting officer.

Any cuts, skins, scrapes, or bruises to the bark of the vegetation shall be carefully trimmed and local nursery accepted procedures used to seal damaged bark.

Any limbs or branches 0.5 inch or larger in diameter that are broken, severed, or otherwise seriously damaged during construction shall be cut off at the base of the damaged limb or branch flush with the adjacent limb or tree trunk. All roots 1-inch or larger in diameter that are cut, broken, or otherwise severed during construction operations shall have the end smoothly cut perpendicular to the root. Roots exposed during excavation or other operations shall be covered with moist earth or backfilled as soon as possible to prevent the roots from drying out.

3. Marking

The limits of the area(s) to be cleared and grubbed will be marked by stakes, flags, tree markings, or other suitable methods. Trees to be left standing and uninjured will be designated by special markings placed on the trunk about 6 feet above the ground surface.

4. Clearing and grubbing

All trees not marked for preservation and all snags, logs, brush, stumps, shrubs, rubbish, and similar materials shall be cleared from within the limits of the designated areas. Unless otherwise specified, all stumps, roots, and root clusters that have a diameter of 1 inch or larger shall be grubbed out to a depth of at least 2 feet below subgrade for concrete structures and 1 foot below the ground surface at embankment sites and other designated areas.

5. Disposal

All materials cleared and grubbed from the designated areas shall be disposed of at locations shown on the drawings or in a manner specified in section 7. The contractor is responsible for complying with all local rules and regulations and the payment of any and all fees that may result from disposal at locations away from the project site.

6. Measurement and payment

Method 1—For items of work for which specific units prices are established in the contract, the cleared and grubbed area is measured to the nearest 0.1 acre. Payment for clearing and grubbing is made for the total area within the designated limits at the contract unit price. Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Method 2—For items of work for which specific unit prices are established in the contract, the length of the cleared and grubbed area is measured to the nearest full station (100 feet) along the line designated on the drawing or identified in the specifications. Payment for clearing and grubbing is made for the total length within the designated limits at the contract unit price. Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Method 3—For items of work for which specific unit prices are established in the contract, each tree, stump, and snag having a diameter of 4 inches or larger and each log having a diameter of 4 inches or larger and a length of 10 feet are measured before removal. The size of each tree and snag is determined by measuring its trunk at breast height above the natural ground surface. The size of each log is determined by measuring the butt and by measuring its length from butt to tip. The size of each stump is measured at the top. Diameter is determined by dividing the measured circumference by 3.14.

Payment for clearing and grubbing of each tree, stump, and snag having a diameter of 4 inches or larger and each log having a diameter of 4 inches or larger and a length of 10 feet or larger is made at the contract unit price for its size designation as determined by the following schedule:

Measured diameter (in)	Size designation (in)
4 to 8	6
8 to 12	10
12 to 24	18
24 to 36	30
36 to 60	48
Over 60	60

The sum of such payments shall constitute full compensation for clearing and grubbing (including the clearing and grubbing of smaller trees, stumps, snags, logs, brush, shrubs, and roots), applicable permits and associated fees, and rubbish removal. Such payment shall constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Method 4—For items of work for which specific lump sum prices are established in the contract, payment for clearing and grubbing is made at the contract lump sum price. Such payment shall constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

All Methods—The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract, but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 7.

7. Items of Work and Construction Details

Items of work to be performed in conformance with this Specification and the construction details therefore are:

All cleared and grubbed materials that have fallen into the channel must be removed prior to completion of each day's operation.

Trees damaged during clearing and grubbing operations shall be treated by trimming loose bark back to live bark at a 45° angle. The damaged area shall be marked with a brown or black paint mark to indicate that the treatment has been completed.

All cleared material where ditch runs through cropland and woods shall be piled at locations mutually agreed upon by the landowner, contractor, and Engineer.

If the landowner wants to burn their brush piles and have the remaining material buried, or simply have the brush piles buried, this will need to be worked out between the landowner and contractor for payment. This will not be part of the project.

The area along the channel where excavated spoil will be spread shall be picked up of all sticks, roots, and other debris that is a minimum of 1-inch in diameter and 12-inches long that will interfere with seeding or farming operations. This shall be done prior to any excavation work. This material shall be disposed of in the piled locations.

Measurement and payment will be by Method 4.

A. Bid Item #1 Ditch Clearing & Grubbing

1. This item shall consist of clearing and grubbing areas along the ditch to be reconstructed within the limits shown on the Engineering Drawings.

Construction Specification 6—Seeding, Sprigging, and Mulching

1. Scope

The work consists of preparing the area for treatment; furnishing and placing seed, sprigs, mulch, fertilizer, inoculant, lime, and other soil amendments; and anchoring mulch in designated areas as specified.

2. Material

Seed—All seed shall conform to the current rules and regulations of the state where it is being used and shall be from the latest crop available. It shall meet or exceed the standard for purity and germination listed in section 7.

Seed shall be labeled in accordance with the state laws and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act in effect on the date of invitations for bids. Bag tag figures are evidence of purity and germination. No seed will be accepted with a test date of more than 9 months before the delivery date to the site.

Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. The percent of noxious weed seed allowable shall be as defined in the current State laws relating to agricultural seeds. Each type of seed shall be delivered in separate sealed containers and fully tagged unless exception is granted in writing by the contracting officer.

Fertilizer—Unless otherwise specified, the fertilizer shall be a commercial grade fertilizer. It shall meet the standard for grade and quality specified by State law. Where fertilizer is furnished from bulk storage, the contractor shall furnish a supplier's certification of analysis and weight. When required by the contract, a representative sample of the fertilizer shall be furnished to the contracting officer for chemical analysis.

Inoculants—The inoculant for treating legume seeds shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species and shall not be used later than the date indicated on the container or as otherwise specified. A mixing medium, as recommended by the manufacturer, shall be used to bond the inoculant to the seed. Two times the amount of the inoculant recommended by the manufacturer shall be used except four times the amount shall be used when seed is applied using a hydraulic seeder. Seed shall be sown within 24 hours of treatment and shall not remain in the hydraulic seeder longer than 4 hours.

Lime and other soil amendments—Lime shall consist of standard ground agriculture limestone, or approved equivalent. Standard ground agriculture limestone is defined as ground limestone meeting current requirements of the State Department of Agriculture. Other soil amendments shall meet quality criteria and application requirements specified in section 7.

Mulch tackifiers—Asphalt emulsion tackifiers shall conform to the requirements of ASTM D 977, Specification for Emulsified Asphalt. The emulsified asphalt may be rapid setting, medium setting, or slow setting. Nonasphaltic tackifiers required because of environmental considerations shall be as specified in section 7.

Straw mulch material—Straw mulch shall consist of wheat, barley, oat or rye straw, hay, grass cut from native grasses, or other plants as specified in section 7. The mulch material shall be air-

dry, reasonably light in color, and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds is not permitted. The contractor shall provide a method satisfactory to the contracting officer for determining weight of mulch furnished.

Other mulch materials—Mulching materials, such as wood cellulose fiber mulch, mulch tackifiers, synthetic fiber mulch, netting, and mesh, are other mulching materials that may be required for specialized locations and conditions. These materials, when specified, must be accompanied by the manufacturer's recommendations for methods of application.

3. Seeding mixtures, sod, sprigs, and dates of planting

The application rate per acre for seed mixtures, sprigs, or sod and date of seeding or planting shall be as shown on the plans or as specified in section 7.

4. Seedbed preparation and treatment

Areas to be treated shall be dressed to a smooth, firm surface. On sites where equipment can operate on slopes safely, the seedbed shall be adequately loosened (4 to 6 inches deep) and smoothed. Depending on soil and moisture conditions, disking or cultipacking, or both, may be necessary to properly prepare a seedbed. Where equipment cannot operate safely, the seedbed shall be prepared by hand methods by scarifying to provide a roughened soil surface so that broadcast seed will remain in place.

If seeding is to be accomplished immediately following construction operations, seedbed preparation may not be required except on a compacted, polished, or freshly cut soil surface.

Rocks larger than 6 inches in diameter, trash, weeds, and other debris that will interfere with seeding or maintenance operations shall be removed or disposed of as specified in section 7.

Seedbed preparation shall be discontinued when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed as determined by the contracting officer's technical representative (COTR).

5. Seeding, sprigging, fertilizing, mulching, and stabilizing

All seeding or sprigging operations shall be performed in such a manner that the seed or sprigs are applied in the specified quantities uniformly in the designated areas. The method and rate of seed application shall be as specified in section 7. Unless otherwise specified, seeding or sprigging shall be accomplished within 2 days after final grading is completed and approved.

Fertilizer, lime, and other soil amendments shall be applied as specified in section 7. When specified, the fertilizer and soil amendments shall be thoroughly incorporated into the soil immediately following surface application.

The rate, amount, and kind of mulching or mesh shall be as specified in section 7. Mulches shall be applied uniformly to the designated areas. They shall be applied to areas seeded not later than 2 working days after seeding has been performed. Straw mulch material shall be stabilized within 24 hours of application using a mulch crimper or equivalent anchoring tool or by a suitable tackifier. When the mulch crimper or equivalent anchoring tool is used, it shall have straight blades and be the type manufactured expressly for and capable of firmly punching the mulch into the soil. Where the equipment can be safely operated, it shall be operated on the contour. Hand methods shall be used where equipment cannot safely operate to perform the work required.

The tackifier shall be applied uniformly over the mulch material at the specified rate, or it shall be injected into the mulch material as it is being applied. Mesh or netting stabilizing materials shall be applied smoothly, but loosely on the designated areas. The edges of these materials shall be

buried or securely anchored using spikes or staples as specified in section 7.

The contractor shall maintain the mesh or netting areas until all work under the contract has been completed and accepted. Maintenance shall consist of the repair of areas damaged by water erosion, wind, fire, or other causes. Such areas shall be repaired to reestablish the intended condition and to the design lines and grades required by the contract. The areas shall be refertilized, reseeded, and mulched before the new application of the mesh or netting.

6. Measurement and payment

Method 1—For items of work for which specific unit prices are established in the contract, each area treated is measured as specified in section 7 and the area calculated to the nearest 0.1 acre. Payment for treatment is made at the contract unit price for the designated treatment, which will constitute full compensation for completion of the work.

When specified as an item of work, mesh or netting is measured to the nearest square yard of surface area covered and accepted. Payment is made at the contract unit price and will constitute full compensation for completion of the work.

Method 2—For items of work for which specific lump sum prices are established in the contract, the quantity of work will not be measured for payment. Payment for this item is made at the contract lump sum price for the item and will constitute full compensation for the completion of the work.

Method 3—For items of work for which lump sum prices are established in the contract, payment is made as the work proceeds. Progress payments will be determined as specified in section 7. Payment of the lump sum contract price will constitute full compensation for completion of the work.

All Methods—The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract, but not listed in the bid schedule is included in the payment for the item of work to which it is made subsidiary. Such items and the item(s) to which they are made subsidiary are identified in section 7.

7. Items of Work and Construction Details

Items of work to be performed in conformance with this Specification and the construction details therefore are:

These items shall include the seeding, fertilizing and mulching of all disturbed areas of the finished ditch slopes and 10-foot berm on the constructed side of the Ditch. It shall also include the seeding and fertilizing of any existing filter strips or CRP ground and the seeding, fertilizing and mulching of all yard areas that are disturbed along the ditch.

Channel banks shall be seeded and fertilized daily after excavation is completed. Berm areas to be seeded shall be graded and seeded in increments as the job progresses and as site conditions are satisfactory. These areas shall be mulched at a minimum once per week, per the engineer's discretion.

Areas disturbed on the bank from construction activities such as tile pipe and riprap installation following excavation will need to be reseeded and mulched after the work is completed in that area.

Any of the seedbed preparation and treatment methods specified in Section 4 of the Specifications is allowed.

Cereal grain straw shall be applied at a rate of 2.5 tons of air-dried material per acre once they have been seeded and fertilized regardless of the time of year this work is done.

All areas to be seeded shall have fertilizer uniformly applied at the following rates: Nitrogen (N) at 75 pounds per acre; Phosphorus (P₂O₅) at 75 pounds per acre; Potassium (K₂O) at 75 pounds per acre. This Specification can be met by applying fertilizer having an analysis of 15-15-15 at the rate of 500 pounds per acre. No lime is required.

Seed tags showing germination and purity shall be attached to all bags.

Seeding rates shall be for Pure Live Seed (PLS) at the time of seeding. Pure Live Seed (PLS) = percent purity x percent germination. Seed shall have the equivalent of a minimum of 80 percent Pure Live Seed (PLS). When the percent purity multiplied by the percent germination gives a percentage less than 80, the rate of seeding will be increased to provide a minimum PLS of 80.

Ditch Bank Seeding – Seed for ditch banks shall consist of the following mixture:

<u>Seeding Period: March 15 – September 30</u> Kentucky 31 Tall Fescue at 80 pounds per acre Perennial Ryegrass at 20 pounds per acre	<u>Seeding Period: October 1 – March 14</u> Kentucky 31 Fall Fescue at 120 pounds per acre Perennial Ryegrass at 30 pounds per acre Wheat at 20 pounds per acre
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Ditch Berm, Filter Strip, & CRP/CREP Seeding – Seed for ditch berms, filter strips, and CRP/CREP shall consist of the following mixture:

<u>Seeding Period: March 15 – September 30</u> Orchard grass at 3 pounds per acre Timothy at 3 pounds per acre Ladino Clover at 3 pounds per acre Alsike Clover at 3 pounds per acre	<u>Seeding Period: October 1 – March 14</u> Orchard grass at 6 pounds per acre Timothy at 6 pounds per acre Ladino Clover at 6 pounds per acre Alsike Clover at 6 pounds per acre Wheat at 20 pounds per acre
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Yard Seeding – Seed for yards shall consist of the following mixture:

<u>Seeding Period: March 15 – September 30</u> Creeping Red Fescue at 20 pounds per acre Perennial Ryegrass at 10 pounds per acre Kentucky Bluegrass at 10 pounds per acre	<u>Seeding Period: October 1 – March 14</u> Creeping Red Fescue at 30 pounds per acre Perennial Ryegrass at 15 pounds per acre Kentucky Bluegrass at 15 pounds per acre
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Measurement and payment for Bid Items #3, #4 will be the Bid Item Lump Sum.

A. Bid Item #3 Seed, Fertilize & Mulch – Ditch Banks

1. This item shall include the seeding, fertilizing and mulching of the disturbed areas of the finished ditch bank slopes on Steele Ditch. Daily fertilizing and seeding of the banks is required.

B. Bid Item #4 Seed, Fertilize & Mulch – 10 Foot Berm

1. This item shall include the seeding, fertilizing and mulching of the 10-foot berm on the constructed side of the finished ditch as shown on the Engineering Drawings.

Construction Specification 21—Excavation

1. Scope

The work shall consist of the excavation required by the drawings and specifications and disposal of the excavated materials.

2. Classification

Excavation is classified as common excavation, rock excavation, or unclassified excavation in accordance with the following definitions.

Common excavation is defined as the excavation of all materials that can be excavated, transported, and unloaded using heavy ripping equipment and wheel tractor-scrapers with pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by excavators having a rated capacity of one cubic yard or larger and equipped with attachments (shovel, bucket, backhoe, dragline, or clam shell) appropriate to the material type, character, and nature of the materials.

Rock excavation is defined as the excavation of all hard, compacted, or cemented materials that require blasting or the use of ripping and excavating equipment larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than 1 cubic yard encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation. The presence of isolated boulders or rock fragments larger than 1 cubic yard is not in itself sufficient cause to change the classification of the surrounding material.

For the purpose of these classifications, the following definitions shall apply:

Heavy ripping equipment is a rear-mounted, heavy duty, single-tooth, ripping attachment mounted on a track type tractor having a power rating of at least 250 flywheel horsepower unless otherwise specified in section 10.

Wheel tractor-scraper is a self-loading (not elevating) and unloading scraper having a struck bowl capacity of at least 12 cubic yards.

Pusher tractor is a track type tractor having a power rating of at least 250 flywheel horsepower equipped with appropriate attachments.

Unclassified excavation is defined as the excavation of all materials encountered, including rock materials, regardless of their nature or the manner in which they are removed.

3. Blasting

The transportation, handling, storage, and use of dynamite and other explosives shall be directed and supervised by a person(s) of proven experience and ability who is authorized and qualified to conduct blasting operations.

Blasting shall be done in a manner as to prevent damage to the work or unnecessary fracturing of the underlying rock materials and shall conform to any special requirements in section 10 of this specification. When specified in section 10, the contractor shall furnish the engineer, in writing, a blasting plan before blasting operations begin.

4. Use of excavated material

Method 1—To the extent they are needed, all suitable material from the specified excavations shall be used in the construction of required permanent earthfill or rockfill. The suitability of material for specific purposes is determined by the engineer. The contractor shall not waste or otherwise dispose of suitable excavated material.

Method 2—Suitable material from the specified excavations may be used in the construction of required earthfill or rockfill. The suitability of material for specific purposes is determined by the engineer.

5. Disposal of waste materials

Method 1—All surplus or unsuitable excavated materials are designated as waste and shall be disposed of at the locations shown on the drawings.

Method 2—All surplus or unsuitable excavated materials are designated as waste and shall be disposed of by the contractor at sites of his own choosing away from the site of the work. The disposal shall be in an environmentally acceptable manner that does not violate local rules and regulations.

6. Excavation limits

Excavations shall comply with OSHA Construction Industry Standards (29CFR Part 1926) Subpart P, Excavations, Trenching, and Shoring. All excavations shall be completed and maintained in a safe and stable condition throughout the total construction phase. Structure and trench excavations shall be completed to the specified elevations and to the length and width required to safely install, adjust, and remove any forms, bracing, or supports necessary for the installation of the work. Excavations outside the lines and limits shown on the drawings or specified herein required to meet safety requirements shall be the responsibility of the contractor in constructing and maintaining a safe and stable excavation.

7. Borrow excavation

When the quantities of suitable material obtained from specified excavations are insufficient to construct the specified earthfills and earth backfills, additional material shall be obtained from the designated borrow areas. The extent and depth of borrow pits within the limits of the designated borrow areas shall be as specified in section 10 or as approved by the engineer.

Borrow pits shall be excavated and finally dressed to blend with the existing topography and sloped to prevent ponding and to provide drainage.

8. Overexcavation

Excavation in rock beyond the specified lines and grades shall be corrected by filling the resulting voids with portland cement concrete made of materials and mix proportions approved by the engineer. Concrete that will be exposed to the atmosphere when construction is completed shall meet the requirements of concrete selected for use under Construction Specification 31, Concrete for Major Structures, or 32, Structure Concrete, as appropriate

Concrete that will be permanently covered shall contain not less than five bags of cement per cubic yard. The concrete shall be placed and cured as specified by the engineer.

Excavation in earth beyond the specified lines and grades shall be corrected by filling the resulting voids with approved, compacted earthfill. The exception to this is that if the earth is to become the subgrade for riprap, rockfill, sand or gravel bedding, or drainfill, the voids may be filled with material conforming to the specifications for the riprap, rockfill, bedding, or drainfill. Before correcting an overexcavation condition, the contractor shall review the planned corrective action with the engineer and obtain approval of the corrective measures.

9. Measurement and payment

For items of work for which specific unit prices are established in the contract, the volume of each type and class of excavation within the specified pay limits is measured and computed to the nearest cubic yard by the method of average cross-sectional end areas or by methods outlined in section 10 of this specification. Regardless of quantities excavated, the measurement for payment is made to the specified pay limits except that excavation outside the specified lines and grades directed by the engineer to remove unsuitable material is included. Excavation required because unsuitable conditions result from the contractor's improper construction operations, as determined by the engineer, is not included for measurement and payment.

Method 1—The pay limits shall be as designated on the drawings.

Method 2—The pay limits shall be defined as follows:

21. The upper limit shall be the original ground surface as it existed before the start of construction operations except that where excavation is performed within areas designated for previous excavation or earthfill, the upper limit shall be the modified ground surface resulting from the specified previous excavation or earthfill.
22. The lower and lateral limits shall be the neat lines and grades shown on the drawings.

Method 3—The pay limits shall be defined as follows:

21. The upper limit shall be the original ground surface as it existed before the start of construction operations except that where excavation is performed within areas designated for previous excavation or earthfill, the upper limit shall be the modified ground surface resulting from the specified previous excavation or earthfill.
22. The lower and lateral limits shall be the true surface of the completed excavation as directed by the engineer.

Method 4—The pay limits shall be defined as follows:

21. The upper limit shall be the original ground surface as it existed before the start of construction operations except that where excavation is performed within areas designated for previous excavation or earthfill, the upper limit shall be the modified ground surface resulting from the specified previous excavation or earthfill.
22. The lower limit shall be at the bottom surface of the proposed structure.
23. The lateral limits shall be 18 inches outside of the outside surface of the proposed structure or shall be vertical planes 18 inches outside of and parallel to the footings, whichever gives the larger pay quantity, except as provided in d below.
24. For trapezoidal channel linings or similar structures that are to be supported upon the sides of the excavation without intervening forms, the lateral limits shall be at the underside of the proposed lining or structure.
25. For the purposes of the definitions in b, c, and d, above, any specified bedding or drainfill directly beneath or beside the structure will be considered to be a part of the structure.

All methods—The following provisions apply to all methods of measurement and payment.

Payment for each type and class of excavation is made at the contract unit price for that type and class of excavation. Such payment will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to the performance of the work except that extra payment for backfilling overexcavation will be made in accordance with the following provisions.

Payment for backfilling overexcavation, as specified in section 8 of this specification, is made only if the excavation outside specified lines and grades is directed by the engineer to remove unsuitable material and if the unsuitable condition is not a result of the contractor's improper construction operations as determined by the engineer.

Compensation for any item of work described in the contract, but not listed in the bid schedule is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 10 of this specification.

10. Items of Work Construction Details

Items of work to be performed in conformance with this Specification and the construction details therefore are:

Ditch channel excavation, including riprap sub-grade, shall not be carried more than 6-inches below the proposed grade lines shown on the drawings. Excavation beyond these limits shall be corrected at the expense of the contractor by filling the resulting voids to the allowable limits. The voids shall be filled as directed by the Engineer.

The contractor shall be responsible for any damage to bridges or culverts as a result of excavation below the allowable limits stated in this Specification.

All excavated rocks measuring 18-inches or larger in diameter shall not be placed with the spoil. These rocks may be placed with other riprap on the project.

All spoil areas shall be raked to a depth of 1-foot with a chisel plow or similar tool that has a maximum shank spacing of 15-inches. After raking, all rocks over 4-inches in maximum dimension, stumps, roots, and other refuse and debris that is a minimum of 1-inch in diameter and 12-inches long that will interfere with seeding or farming operations shall be removed. All material removed by raking, except for rocks, shall be piled with the brush piles or as directed by the Engineer. All rocks that are raked up can be placed with other riprap on the project or buried with at least 4 foot of cover and as directed by the Engineer.

All spoil material shall be placed and graded to drain as shown in the drawings. After raking and picking of the spoil, the surface shall be graded with a land leveler in combination with other suitable equipment to remove all depression areas and break up any clods so as to leave the surface smooth and uniform. Any remaining rocks and debris shall be removed.

All areas within the work limits are to have positive grade. This may involve the construction of a drainage way or surface drain. This work shall be considered as incidental.

The work limits may be moved out at the direction of the Engineer to allow for the placement of spoil.

The markings for previously located tile outlets shall be preserved during excavation and all other tile outlets located during excavation shall be marked.

All traffic by wheel-type vehicles, except for pick-up trucks, is limited to the work area unless permission in writing is granted by the Engineer.

Common excavation required for the installation of tile, pipes, and all riprap will be part of the bid item for that work.

Before final acceptance, all cultivated areas where any vehicular traffic has occurred shall be ripped 12-inches deep with a chisel plow or other suitable equipment. All rocks and debris shall be removed.

Measurement and payment for Bid Item #2 will be the Bid Item Lump Sum.

A. Bid Item #2 Common Excavation, Leveling & Hauling

1. This item shall consist of common excavation and leveling of the ditch. All excavation shall meet the construction lines as shown on the Engineering Drawings. This includes the hauling of majority of the spoil to a location within 3 miles and stockpiling. Approximately 500 cubic yards to be leveled and 1,500 cubic yards to be hauled.

Construction Specification 44—Corrugated Polyethylene Tubing

1. Scope

The work consists of furnishing and installing tubing and the necessary fittings and appurtenances as shown on the drawings and as outlined in this specification.

2. Material

Corrugated polyethylene tubing and fittings shall conform to the material requirements as outlined in Material Specification 548, Corrugated Polyethylene Tubing.

When perforations are specified, the water inlet area shall be a minimum of 1 square inch per lineal foot of tubing. The inlets either shall be circular perforations or slots equally spaced along the length and circumference of the tubing. Unless otherwise specified, circular perforations shall not exceed 3/16 inch in diameter, and slot perforations shall not be more than 1/8 inch wide.

Geotextile filter socks, when required, shall meet the material requirements outlined in section 9 of this specification.

Granular bedding material, when specified, shall conform to the requirements specified in section 9 of this specification.

The tubing shall be appropriately marked with ASTM or AASHTO designation.

3. Handling and storage

Tubing shall be delivered to the job site and handled by means that provide adequate support to the tubing and do not subject it to undue stresses or damage. When handling and placing corrugated polyethylene tubing, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting (by metal edges and/or surface or rocks). The manufacturer's special handling requirements shall be strictly observed. Special care shall be taken to avoid impact when the pipe must be handled at a temperature of 40 degrees Fahrenheit or less.

Tubing shall be stored on a relatively flat surface so that the full length of the tube is evenly supported. Unless the tube is specifically manufactured to withstand exposure to ultraviolet radiation, it shall be covered with an opaque material when stored outdoors for 15 days or longer.

4. Excavation

Unless otherwise specified or approved by the engineer, excavation for and subsequent installation of each tube line shall begin at the outlet end and progress up grade. The trench or excavation for the tubing shall be constructed to the lines, depths, cross sections, and grade shown on the drawings, specified in Section 9 of this specification, or as approved by the engineer.

Trench shields, shoring and bracing, or other suitable methods necessary to safeguard the contractor's employees and the works of improvement and to prevent damage to the existing improvements shall be furnished, placed, and subsequently removed by the contractor.

5. Preparing the tubing bed and blinding the tubing

When a granular filter or envelope is specified, the filter or envelope material shall be placed in the bottom of the trench just before the tubing is laid. The tubing shall then be laid and the filter and envelope material placed to a depth over the top of the tubing of not less than that shown on the drawings or as specified in section 9 of this specification.

When a granular filter or envelope is not specified, the bottom of the trench shall be shaped to form a semicircular or trapezoidal groove in its center. This groove shall provide support for not less than a fourth of the outside circumference of the tubing. After the tubing is placed in the excavated groove, it shall be capped with friable material from the sides of the trench. The friable material shall be placed around the tubing, completely filling the trench to a depth of at least 3 inches over the top of the tubing. For material to be suitable, it must not contain hard clods, rocks, frozen soil, or fine material that will cause a silting hazard to the drain. Tubing placed during any day shall be blinded (place required soil material around and over pipe) and temporarily capped before construction activities are completed for that day.

6. Placement and joint connections

All tubing shall be installed to grade as shown on the drawings. After the tubing is placed in the trench and blinded, allow sufficient time for the tubing to adapt to the soil temperature before backfilling.

Maximum allowable stretch of the tubing is 5 percent. Special precautions must be implemented on hot, bright days to ensure that the stretch limit is not exceeded and excessive deflection does not occur as a result of installation procedures, including backfill operations.

Unless otherwise specified in section 9 of this specification or shown on the drawings, connections are made with manufactured junctions comparable in strength with the specified tubing. All split fittings shall be securely fastened with nylon cord or plastic zip ties before any backfill is placed. All buried ends shall be supplied with end caps unless otherwise approved by the engineer.

7. Backfilling

Unless otherwise specified in section 9 of this specification, the backfilling of the trench shall be as shown on the drawings and completed as rapidly as is consistent with the soil conditions. Automatic backfilling machines may be used only when approved by the engineer. Backfill shall extend above the ground surface and be well rounded and centered over the trench.

8. Measurement and payment

Method 1—For items of work for which specific unit prices are established in the contract, the quantity of each kind and size of tubing is determined to the nearest foot of length measured along the centerline of the installed tubing. Payment for each kind and size of tubing is made at the contract unit price for that kind and size of tubing. Such payment constitutes full compensation for all labor, equipment, tools, and all other items necessary and incidental to furnishing, transporting, and installing the tubing, including excavation, shoring, geotextile or granular filter (when specified), backfill and all fittings, appurtenances, and other items required to complete the work. Payment for appurtenances listed separately in the bid schedule is made at the contract unit price(s) for the size and type of appurtenance listed.

Method 2—For items of work for which specific unit prices are established in the contract, the

quantity of each kind, size, and class of tubing is determined to the nearest foot by measurement of the laid length along the crown centerline of the tubing. Payment for each kind, size, and class of tubing is made at the contract unit price for the kind, size, and class. Such payment constitutes full compensation for furnishing, transporting, and installing the tubing, including shoring, all fittings, thrust blocks, appurtenances, and other items necessary and incidental to the completion of the work. Payment for appurtenances listed separately in the bid schedule are made at the contract prices for those items.

Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 9 of this specification.

9. Items of Work and Construction Details

Items of work to be performed in conformance with the Specification and the construction details therefore are:

Polyethylene (PE) outlet pipes as well as Polyethylene (PE) field tile shall meet Federal Specifications as directed in the Material Specification #548 of this booklet.

Also refer to Construction Specification #61, and Material Specification #523, for rock riprap information.

All new outlet pipes will have a flapper-type manufactured animal guard installed at the time of pipe installation.

All existing outlet pipes in satisfactory condition shall be disturbed as little as possible during construction. The landowners or Engineer will be responsible for locating all tile outlets prior to construction. These shall be marked in a suitable manner so as to be easily recognized by the contractor. The contractor will be liable for damage to any existing outlet pipe marked by the landowner.

Prior to completion of construction, the inspector will inspect all outlets. Damaged outlets and outlets not meeting NRCS specifications will be marked and these outlets will be replaced or modified to meet NRCS specifications before construction shall be considered completed.

All 6-inch diameter and larger field tile that have outlet pipes installed on them will also have riprap protection placed under them at time of pipe installation.

Total number of tile outlets is unknown. Tile uncovered during excavation that need to have outlets installed on them will be done at the Bid Item Unit Price.

The Engineer will determine during construction what tile need pipes and/or riprap installed on them.

Measurement and payment for Bid Item #5 will be the Bid Item Unit Price.

Measurement and payment for Bid Item #6, #7 will be the Bid Item Lump Sum.

A. Bid Item #5 Tile Outlets

1. This item shall consist of excavation, labor, and materials required to install the 4" non-perforated CPTS tile outlets into the ditch. A 10' section of pipe is required for these outlets. A flapper-type animal guard is to be installed on this outlet. All connections shall be made with manufactured fittings. Refer to Specifications and typical detail in the Engineering Drawings.

B. Bid Item #6 Culvert Install

2. This item shall consist of excavation, earthfill, labor and material (CPTS pipe, stone, and riprap) required to install culvert according to the Specifications and drawings in the Engineering Drawings for the following locations:
a. Station 3+93 to 4+23

C. Bid Item #7 Road Ditch / Access Culverts

3. This item shall consist of excavation, earthfill, labor and material (CPTS pipe, stone, and riprap) required to install culvert according to the Specifications and drawings in the Engineering Drawings for the following locations:
a. Station 21+36 right side of Steele Ditch in road ditch

Construction Specification 61—Rock Riprap

1. Scope

The work shall consist of the construction of rock riprap revetments and blankets, including filter or bedding where specified.

2. Material

Rock riprap shall conform to the requirements of Material Specification 523, Rock for Riprap, or if so specified, shall be obtained from designated sources. It shall be free from dirt, clay, sand, rock fines, and other material not meeting the required gradation limits.

At least 30 days before rock is delivered from other than designated sources, the contractor shall designate in writing the source from which rock material will be obtained and provide information satisfactory to the contracting officer that the material meets contract requirements. The contractor shall provide the contracting officer's technical representative (COTR) free access to the source for the purpose of obtaining samples for testing. The size and grading of the rock shall be as specified in section 8.

Rock from approved sources shall be excavated, selected, and processed to meet the specified quality and grading requirements at the time the rock is installed.

When specified in section 8 or requested by the contracting officer, a gradation quality control check shall be made by the contractor and be subject to inspection by the COTR. The test shall be performed at the worksite in accordance to ASTM D 5519 Test Method B Size, Size-Range Grading, on a test pile of representative rock. The weight or size of the test pile shall be large enough to ensure a representative gradation of rock from the source and to provide test results within a 5 percent accuracy.

Based on a specific gravity of 2.65 (typical of limestone and dolomite) and assuming the individual rock is shaped midway between a sphere and a cube, typical size/weight relationships are:

Sieve size of rock	Approx. weight of rock	Weight of test pile
16 inches	300 pounds	6,000 pounds
11 inches	100 pounds	2,000 pounds
6 inches	15 pounds	300 pounds

The results of the test shall be compared to the gradation required for the project. Test pile results that do not meet the construction specifications shall be cause for the rock to be rejected. The test pile that meets contract requirements shall be left on the job site as a sample for visual comparison. The test pile shall be used as part of the last rock riprap to be placed.

Filter or bedding aggregates when required shall conform to Material Specification 521, Aggregates for Drainfill and Filters, unless otherwise specified. Geotextiles shall conform to Material Specification 592, Geotextile.

3. Subgrade preparation

The subgrade surface on which the rock riprap, filter, bedding, or geotextile is to be placed shall be cut or filled and graded to the lines and grades shown on the drawings. When fill to subgrade lines is required, it shall consist of approved material and shall conform to the requirements of the specified class of earthfill.

Rock riprap, filter, bedding, or geotextile shall not be placed until the foundation preparation is completed and the subgrade surface has been inspected and approved.

4. Equipment-placed rock riprap

The rock riprap shall be placed by equipment on the surface and to the depth specified. It shall be installed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying material. The rock for riprap shall be delivered and placed in a manner that ensures the riprap in place is reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks and spalls filling the voids between the larger rocks. Some hand placing may be required to provide a neat and uniform surface.

Rock riprap shall be placed in a manner to prevent damage to structures. Hand placing is required as necessary to prevent damage to any new and existing structures.

5. Hand placed rock riprap

The rock riprap shall be placed by hand on the surface and to the depth specified. It shall be securely bedded with the larger rocks firmly in contact one to another without bridging. Spaces between the larger rocks shall be filled with smaller rocks and spalls. Smaller rocks shall not be grouped as a substitute for larger rock. Flat slab rock shall be laid on its vertical edge except where it is laid like paving stone and the thickness of the rock equals the specified depth of the riprap course.

6. Filter or bedding

When the contract specifies filter, bedding, or geotextile beneath the rock riprap, the designated material shall be placed on the prepared subgrade surface as specified. Compaction of filter or bedding aggregate is not required, but the surface of such material shall be finished reasonably smooth and free of mounds, dips, or windrows.

7. Measurement and payment

Method 1—For items of work for which specific unit prices are established in the contract, the quantity of each type of rock riprap placed within the specified limits is computed to the nearest ton by actual weight. The volume of each type of filter or bedding aggregate is measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas. For each load of rock riprap placed as specified, the contractor shall furnish to the COTR a statement-of-delivery ticket showing the weight to the nearest 0.1 ton.

Payment is made at the contract unit price for each type of rock riprap, filter, or bedding. Such payment is considered full compensation for completion of the work.

Method 2—For items of work for which specific unit prices are established in the contract, the quantity of each type of rock riprap placed within the specified limits is computed to the nearest 0.1 ton by actual weight. The quantity of each type of filter or bedding aggregate delivered and placed within the specified limits is computed to the nearest 0.1 ton. For each load of rock riprap placed as specified, the contractor shall furnish to the engineer a statement-of-delivery ticket showing the weight to the nearest 0.1 ton. For each load of filter or bedding aggregate, the contractor shall furnish to the COTR a statement-of-delivery ticket showing the weight to the nearest 0.1 ton.

Payment is made at the contract unit price for each type of rock riprap, filter, or bedding. Such payment is considered full compensation for completion of the work.

Method 3—For items of work for which specific unit prices are established by the contract, the volume of each type of rock riprap and filter or bedding aggregate is measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas.

Payment is made at the contract unit price for each type of rock riprap, filter, or bedding. Such payment is considered full compensation for completion of the work.

Method 4—For items of work for which specific unit prices are established by the contract, the volume of each type of rock riprap, including filter and bedding aggregate, is measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas.

Payment is made at the contract unit price for each type of rock riprap, including filter and bedding. Such payment is considered full compensation for completion of the work.

Method 5—For items of work for which specific unit prices are established by the contract, the quantity of each type of rock riprap placed within the specified limits is computed to the nearest ton by actual weight. For each load of rock for riprap placed as specified, the contractor shall furnish to the COTR a statement-of-delivery ticket showing the weight to the nearest 0.1 ton.

Payment is made at the contract unit price for each type of rock riprap, including geotextile used for filter or bedding. Such payment is considered full compensation for completion of the work.

Method 6—For items of work for which specific unit prices are established by the contract, the volume of each type of rock riprap is measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas.

Payment is made at the contract unit price for each type of rock riprap, including geotextile used for filter or bedding. Such payment is considered full compensation for completion of the work.

All methods—The following provision applies to all methods of measurement and payment. Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 8.

No separate payment is made for testing the gradation of the test pile. Compensation for testing is included in the appropriate bid item for riprap.

8. Items of Work and Construction Details

Items of work to be performed in conformance with this Specification and the construction details therefore are:

The rock is to be placed at locations shown on the Engineering Drawings and at locations designated by the Engineer at the time of construction.

Riprap furnished under this Bid shall meet the following gradation requirements.

ODOT Type 'C' and 'D' – gradation as specified in the 2008 ODOT Construction and Materials Specifications Section 601.04. Also refer to Material Specification #523 in this booklet. Designated sources for this material will be: StoneCo Quarries – Van Wert County or Auglaize Quarry.

If the material is obtained from these sources, no material certification is required.

The stationing is for calculation purposes only. Actual locations will be determined at the time of construction.

All tonnage figures are based on a conversion of 1.5 ton per cubic yard.

Measurement and payment for Bid Item #8 will be the Bid Item Unit Price.

Measurement and payment for Bid Item #9, #10 will be the Bid Item Lump Sum.

A. Bid Item #8 Ditch Bank Riprap– ODOT Type “C” & “D” with Stone Drainfill

1. This item shall consist of furnishing, transporting, excavating, and placing rock riprap with stone drainfill according to the Specifications and locations as shown on Engineering Drawings. These will be installed using a mix of 50% Type “D” and 50% Type “C” riprap.

B. Bid Item #9 Rock Pad – ODOT Type “C” & “D”

2. This item shall consist of furnishing, transporting, excavating, and placing rock riprap below the 30” CPTS road pipe from Stations 21+28 to 21+36 according to the Specifications and detail in the Engineering Drawings. These will be installed using a mix of 50% Type “D” and 50% Type “C” riprap.

C. Bid Item #10 Rock Lined Channel – ODOT Type “C” & “D”

3. This item shall consist of furnishing, transporting, excavating, and placing rock riprap from Stations 14+18 to 14+40 according to the Specifications and detail in the Engineering Drawings. These will be installed using a mix of 50% Type “D” and 50% Type “C” riprap.

Construction Specification 95—Geotextile

1. Scope

This work consists of furnishing all material, equipment, and labor necessary for the installation of geotextiles.

2. Quality

Geotextiles shall conform to the requirements of Material Specification 592 and this specification.

3. Storage

Before use, the geotextile shall be stored in a clean, dry location out of direct sunlight, not subject to extremes of either hot or cold temperatures, and with the manufacturer's protective cover undisturbed. Receiving, storage, and handling at the job site shall be in accordance with the requirements listed 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. It shall be reasonably smooth and free of loose rock and clods, holes, depressions, projections, muddy conditions, and standing or flowing water (unless otherwise specified in section 7 of this specification).

5. Placement

Before the geotextile is placed, the soil surface will be reviewed for quality assurance of the 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 and specified in section 7 of this specification. It shall be unrolled along the placement area and loosely laid, without stretching, in such a manner that it conforms to the surface irregularities when material or gabions are placed on or against it. The geotextile may be folded and overlapped to permit proper placement in designated area(s).

Method 1—The geotextile shall be joined by machine sewing using thread material meeting the chemical requirements for the geotextile fibers or yarn. The sewn overlap shall be 6 inches, and the sewing shall consist of two parallel stitched rows at a spacing of about 1 inch and shall not cross (except for any required re-stitching). The stitching shall be a lock-type stitch. Each row of stitching shall be located a minimum of 2 inches from the geotextile edge. The seam type and sewing machine to be used shall produce a seam strength, in the specified geotextile, that provides a minimum of 90 percent of the tensile strength in the weakest principal direction of the geotextile being used, when tested in accordance with ASTM D 4884. The seams may be factory or field sewn.

The geotextile shall be temporarily secured during placement of overlying material to prevent slippage, folding, wrinkling, or other displacement of the geotextile. Unless otherwise specified, methods of securing shall not cause punctures, tears, or other openings to be formed in the geotextile.

Method 2—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 through the geotextile. Steel washers shall be provided on all but the U-shaped pins. The upstream or upslope geotextile shall overlap the abutting downslope geotextile. At vertical laps, securing pins shall be inserted through the bottom layers along a line through approximately the mid-point of the overlap. At horizontal laps and across slope laps, securing shall be inserted through the bottom layer only. Securing pins shall be placed along a line about 2 inches in from the edge 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 remain in place unless otherwise specified.

Should the geotextile be torn or punctured, or the overlaps or sewn joint 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 and overlaying the existing geotextile. When the geotextile seams are required to be sewn, the overlay patch shall extend a minimum of 1 foot beyond the edge of any damaged area and joined by sewing as required for the original geotextile except that the sewing shall be a minimum of 6 inches from the edge of the damaged geotextile. Geotextile panels joined by overlap shall have the patch extend a minimum of 2 feet from the edge of any damaged area.

Geotextile shall be placed in accordance with the following applicable specification according to the use indicated in section 7:

Slope protection—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. In no case shall material be dropped on uncovered geotextile from a height of more than 3 feet.

Subsurface drains—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.

Road stabilization—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. Measurement and payment

Method 1—For items of work for which specific unit prices are established in the contract, the quantity of geotextile for each type placed within the specified limits is determined to the nearest specified unit by measurements of the covered surfaces only, disregarding that required for anchorage, seams, and overlaps. Payment is made at the contract unit price. Such payment constitutes full compensation for the completion of the work.

Method 2—For items of work for which specific unit prices are established in the contract, the quantity of geotextile for each type placed with the specified limits is determined to the nearest specified unit by computing the area of the actual roll size or partial roll size installed. The computed area will include the amount required for overlap, seams, and anchorage as specified. Payment is made at the contract unit price. Such payment constitutes full compensation for the completion of the work.

Method 3—For items of work for which specific lump sum prices are established in the contract, the quantity of geotextile is not measured for payment. Payment for geotextiles is made at the contract lump sum price and constitutes full compensation for the completion of the work.

All methods—The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract, but not listed in the bid schedule, is included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in section 7 of this specification.

7. Items of Work and Construction Details

Items of work to be performed with this Specification and the construction details therefore are:

No separate measurement and payment for geotextile filter fabric will be made. Payment will be included with the riprap bid items.

Also refer to Construction Specification #61 and Material Specification #523 for rock riprap, and Material Specification #592 for Geotextile Filter Fabric.

Material Specification 523—Rock for Riprap

1. Scope

This specification covers the quality of rock to be used in the construction of rock riprap.

2. Quality

Individual rock fragments shall be dense, sound, and free from cracks, seams, and other defects conducive to accelerated weathering. Except as otherwise specified, the rock fragments shall be angular to subrounded. The least dimension of an individual rock fragment shall be not less than one-third the greatest dimension of the fragment. ASTM D 4992 provides guidance on selecting rock from a source.

Except as otherwise provided, the rock shall be tested and shall have the following properties:

Rock type 1

- **Bulk specific gravity** (saturated surface-dry basis)—Not less than 2.5 when tested in accordance with ASTM C 127 on samples prepared as described for soundness testing.
- **Absorption**—Not more than 2 percent when tested in accordance with ASTM C 127 on samples prepared as described for soundness testing.
- **Soundness**—The weight loss in 5 cycles shall not be more than 10 percent when sodium sulfate is used or more than 15 percent when magnesium sulfate is used.

Rock type 2

- **Bulk specific gravity** (saturated surface-dry basis)—Not less than 2.5 when tested in accordance with ASTM C 127 on samples prepared as described for soundness testing.
- **Absorption**—Not more than 2 percent when tested in accordance with ASTM C 127 on samples prepared as described for soundness testing.
- **Soundness**—The weight loss in 5 cycles shall be not more than 20 percent when sodium sulfate is used or more than 25 percent when magnesium sulfate is used.

Rock type 3

- **Bulk specific gravity** (saturated surface-dry basis)—Not less than 2.3 when tested in accordance with ASTM C 127 on samples prepared as described for soundness testing.
- **Absorption**—Not more than 4 percent when tested in accordance with ASTM C 127 on samples prepared as described for soundness testing.
- **Soundness**—The weight loss in 5 cycles shall be not less than 20 percent when sodium sulfate is used or more than 25 percent when magnesium sulfate is used.

3. Methods of soundness testing

Rock cube soundness—The sodium or magnesium sulfate soundness test for all rock types (1, 2, or 3) shall be performed on a test sample of $5,000 \pm 300$ grams of rock fragments, reasonably uniform in size and cubical in shape, and weighing, after sampling, about 100 grams each. They shall be obtained from rock samples that are representative of the total rock mass, as noted in ASTM D 4992, and that have been sawed into slabs as described in ASTM D 5121. The samples shall further be reduced in size by sawing the slabs into cubical blocks. The thickness of the slabs and the size of the sawed fragments shall be determined by the size of the available test apparatus and as necessary to provide, after sawing, the approximate 100-gram samples. The cubes shall undergo five cycles of soundness testing in accordance with ASTM C 88.

Internal defects may cause some of the cubes to break during the sawing process or during the initial soaking period. Do not test any of the cubes that break during this preparatory process. Such breakage, including an approximation of the percentage of cubes that break, shall be noted in the test report.

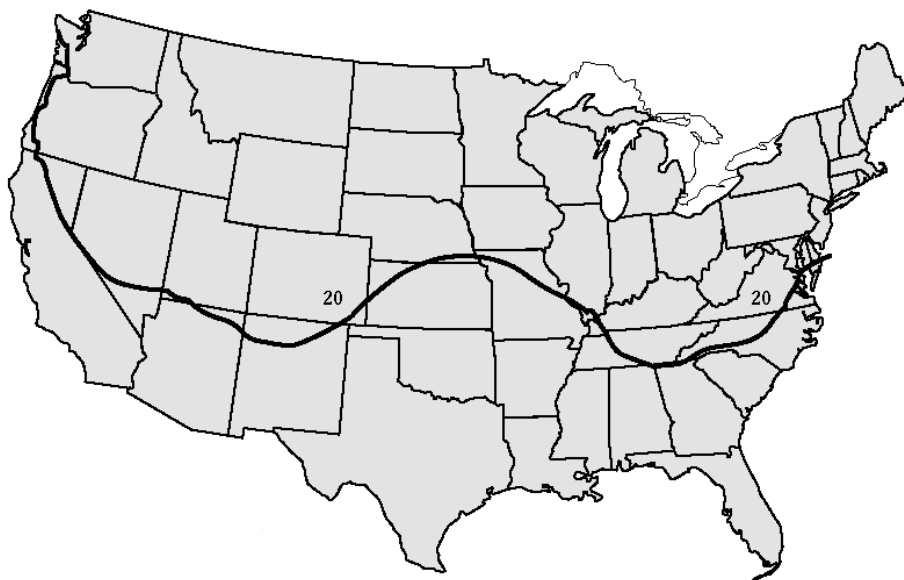
After the sample has been dried following completion of the final test cycle and washed to remove the sodium sulfate or magnesium sulfate, the loss of weight shall be determined by subtracting from the original weight of the sample the final weight of all fragments that have not broken into three or more fragments.

The test report shall show the percentage loss of the weight and the results of the qualitative examination.

Rock slab soundness—When specified, the rock shall also be tested in accordance with ASTM D 5240. Deterioration of more than 25 percent of the number of blocks shall be cause for rejection of rock from this source. Rock shall also meet the requirements for average percent weight loss stated below.

- For projects located north of the Number 20 Freeze-Thaw Severity Index Isoline (fig. 523–1). Unless otherwise specified, the average percent weight loss for Rock Type 1 shall not exceed 20 percent when sodium sulfate is used or 25 percent when magnesium sulfate is used. For Rock Types 2 and 3, the average percent weight loss shall not exceed 25 percent for sodium sulfate soundness or 30 percent for magnesium sulfate soundness.
- For projects located south of the Number 20 Freeze-Thaw Severity Index Isoline, unless otherwise specified, the average percent weight loss for Rock Type 1 shall not exceed 30 percent when sodium sulfate is used or 38 percent when magnesium sulfate is used. For Rock Types 2 and 3, the average percent weight loss shall not exceed 38 percent for sodium sulfate soundness or 45 percent for magnesium sulfate soundness.

Figure 523–1 Number 20 freeze-thaw severity index isoline (map approximates the map in ASTM D 5312)



4. Field durability inspection

Rock that fails to meet the material requirements stated above (if specified), may be accepted only if similar rock from the same source has been demonstrated to be sound after 5 years or more of service under conditions of weather, wetting and drying, and erosive forces similar to those anticipated for the rock to be installed under this specification.

A rock source may be rejected if the rock from that source deteriorates in 3 to 5 years under similar use and exposure conditions expected for the rock to be installed under this specification, even though it meets the testing requirements stated above.

Deterioration is defined as the loss of more than one-quarter of the original rock volume, or severe cracking that would cause a block to split.

Measurements of deterioration are taken from linear or surface area particle counts to determine the percentage of deteriorated blocks. Deterioration of more than 25 percent of the pieces shall be cause for rejection of rock from the source.

5. Grading

The rock shall conform to the specified grading limits after it has been placed within the matrix of the rock riprap.

Material Specification 548—Corrugated Polyethylene Tubing

1. Scope

The specification covers the quality of corrugated polyethylene tubing and fittings.

2. Tubing

Corrugated polyethylene tubing shall conform to the requirements of ASTM F 405, ASTM F 667, ASTM F 894, AASHTO M 252, or AASHTO M 294 for the appropriate tubing sizes and fittings.

3. Fittings

ASTM F 405	3-6 inch diameter pipe and fittings
ASTM F 667	8-, 10-, 12-, 15-, 18-, and 24-inch diameter pipe and fittings
ASTM F 894	18- to 120-inch diameter pipe and fittings
AASHTO M 252	3- to 10-inch diameter N12 pipe and fittings
AASHTO M 294	12- to 36-inch diameter N12 pipe and fittings

Material Specification 592—Geotextile

1. Scope

This specification covers the quality of geotextiles.

2. General requirements

Fibers (threads and yarns) used in the manufacture of geotextile shall consist of synthetic polymers composed of a minimum of 85 percent by weight polypropylenes, polyesters, polyamides, polyethylene, polyolefins, or polyvinylidene-chlorides. They shall be formed into a stable network of filaments or yarns retaining dimensional stability relative to each other. The geo-textile shall be free of defects and conform to the physical requirements in tables 592–1 and 592–2. The geotextile shall be free of any chemical treatment or coating that significantly reduces its porosity. Fibers shall contain stabilizers and/or inhibitors to enhance resistance to ultraviolet light.

Thread used for factory or field sewing shall be of contrasting color to the fabric and made of high strength polypropylene, polyester, or polyamide thread. Thread shall be as resistant to ultraviolet light as the geotextile being sewn.

3. Classification

Geotextiles shall be classified based on the method used to place the threads or yarns forming the fabric. The geotextiles will be grouped into woven and nonwoven types.

Woven—Fabrics formed by the uniform and regular interweaving of the threads or yarns in two directions. Woven fabrics shall be manufactured from monofilament yarn formed into a uniform pattern with distinct and measurable openings, retaining their position relative to each other. The edges of fabric shall be selvaged or otherwise finished to prevent the outer yarn from unraveling.

Nonwoven—Fabrics formed by a random placement of threads in a mat and bonded by heat-bonding, resin-bonding, or needle punching. Nonwoven fabrics shall be manufactured from individual fibers formed into a random pattern with distinct, but variable small openings, retaining their position relative to each other when bonded by needle punching, heat, or resin bonding. The use of nonwovens other than the needle punched geotextiles is somewhat restricted (see note 3 of table 592–2).

4. Sampling and testing

The geotextile shall meet the specified requirements (table 592–1 or 592–2) for the product style shown on the label. Product properties as listed in the latest edition of the "Specifiers Guide," Geotechnical Fabrics Report, (Industrial Fabrics Association International, 1801 County Road BW, Roseville, MN 55113-4061) and that represent minimum average roll values, are acceptable documentation that the product style meets the requirements of these specifications.

For products that do not appear in the above directory or do not have minimum average roll values listed, typical test data from the identified production run of the geotextile will be required for each of the specified tests (tables 592–1 or 592–2) as covered under clause AGAR 452.236-76.

5. Shipping and storage

The geotextile shall be shipped/transported in rolls wrapped with a cover for protection from moisture, dust, dirt, debris, and ultraviolet light. The cover shall be maintained undisturbed to the maximum extend possible before placement.

Each roll of geotextile shall be labeled or tagged to clearly identify the brand, class, and the individual production run in accordance with ASTM D 4873.

Table 592–1 Requirements for woven geotextiles

Property	Test method	Class I	Class II & III	Class IV
Tensile strength (pounds) ^{1/}	ASTM D 4632 grab test	200 minimum in any principal direction	120 minimum in any principal direction	180 minimum in any principal direction
Elongation at failure (percent) ^{1/}	ASTM D 4632 grab test	<50	<50	<50
Puncture (pounds) ^{1/}	ASTM D 4833	90 minimum	60 minimum	60 minimum
Ultraviolet light (% residual tensile strength)	ASTM D 4355 150-hr exposure	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTM D 4751	As specified, but no smaller than 0.212 mm (#70) ^{2/}	As specified, but no smaller than 0.212 mm (#70) ^{2/}	As specified, but no smaller than 0.212 mm (#70) ^{2/}
Percent open area (percent)	CWO-02215-86	4.0 minimum	4.0 minimum	1.0 minimum
Permittivity sec ⁻¹	ASTM D 4491	0.10 minimum	0.10 minimum	0.10 minimum

1/ Minimum average roll value (weakest principal direction).

2/ U.S. standard sieve size.

Note: CWO is a USACE reference.

Table 592–2 Requirements for nonwoven geotextiles

Property	Test method	Class I	Class II	Class III	Class IV ^{3/}
Tensile strength (lb) ^{1/}	ASTMD 4632 grab test	180 minimum	120 minimum	90 minimum	115 minimum
Elongation at failure (%) ^{1/}	ASTMD 4632	≥50	≥50	≥50	≥50
Puncture (pounds)	ASTMD 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet light (% residual tensile strength)	ASTMD 4355 150-hr exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent opening size (AOS)	ASTMD 4751	As specified max. #40 ^{2/}	As specified max. #40 ^{2/}	As specified max. #40 ^{2/}	As specified max. #40 ^{2/}
Permittivity sec ⁻¹	ASTMD 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 minimum

1/ Minimum average roll value (weakest principal direction).

2/ U.S. standard sieve size.

3/ Heat-bonded or resin-bonded geotextile may be used for classes III and IV. They are particularly well suited to class IV. Needle-punched geotextiles are required for all other classes.