HAMBLEN COUNTY GOVERNMENT
Invitation to Bid – 2025-26 Storm Water Projects
TDEC ARP 2022-8540; SW-PDC-1,2&3

INVITATION TO BID

Office of the Hamblen County Mayor
511 West Second North Street
Morristown, TN 37814

ITB TIMELINE: Times listed below are in Eastern Standard Time.

Date Issued:	Monday; October 27, 2025
ITB Title:	2025-26 Hamblen County Storm Water Projects 2026-8540
Project Question Deadline:	Monday, November 10th at 2:00 pm *All correspondence and communication must be via email to the designated Hamblen County point-of-contact listed on page 4 of this document. Questions submitted by telephone will not be answered. Questions submitted after this deadline will not be answered.*
Posting of Responses to Questions:	Wednesday, November 12th at 5:00 pm
Bid Submission Deadline Date & Time:	Tuesday, November 18 at 2:00 pm *If the Hamblen County Courthouse is closed for business at the time scheduled for bid opening, for whatever reason, bids will be accepted and opened on the next business day of the County, at the originally scheduled hour.*
Bid Submission Opening Location:	West Wing Conference Room, 511 W 2nd N St Morristown TN 37814
Project Award:	December 18, 2025

Bidder Initials_____

INTRODUCTION:

Hamblen County (hereafter referred to as "County") is soliciting sealed, competitive bids for TDEC 2022-8540; Stormwater Projects

Contractor Shall be bonded and insured for no less than $1 million for General Liability, Auto Liability, and Workers Compensation with statutory limits including $1,000,000 Part B Employers Liability.

Contractor Shall be Responsible for Materials Until Installation, and /or Project is Completed.

The County's selection process will be based on qualifications and experience with similar projects and competitiveness of proposed fees.

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Bidder Initials_____

I. SCOPE OF SERVICES / SPECIFICATIONS:

Hamblen County has been awarded TDEC Water Infrastructure grant money to correct storm water drainage problems in three neighborhoods. In Priority Ranking, they are: Deerwood Shadows Subdivision, Meadows Subdivision and the area surrounding Brady Drive in west Hamblen County. The County will award the contract for the Deerwood Shadows and Meadows projects and decide on the Brady Drive project based on the amount of money available to complete the project. The construction plans and technical specifications for each project are included in this ITB as Exhibits A through D.

The County prefers to issue the projects as a group but reserves the right to award them to separate proposers based on the pricing submitted for each project and the ability to complete all three projects with the available funding.

Bidder Initials_____

II. GENERAL INFORMATION:

Project Administrator:

The County Finance Department is the sole point of contact for this procurement. All communication between prospective bidders and the County upon receipt of this ITB shall be in email form to the County Finance Department as follows:

Barbara Horton
511 West Second North Street
Morristown, TN 37814
Telephone: 423-586-1931
Email: barbara.horton@co.hamblen.tn.us

Any other communication will be considered unofficial and non-binding on the County. Communication directed to parties other than the County Finance Department may result in disqualification of the prospective proposer.

Site Visit:

Pre-bid site visits for all three projects are scheduled for November 11th @ 10am.The site visits are not mandatory, but Hamblen County encourages interested proposers to attend the visits with the project engineer on the specified date. All interested companies should gather at Ingles, 3980 W Andrew Johnson Hwy, Morristown, TN, at the south end of the parking lot 15 minutes before the start of the site visits. Contact Bill Brittain at (423) 312-0480 if you intend to participate with the site visits. Site visits are meant to help prospective bidders in preparing an accurate proposal. Site visits carry no weight in awarding this project.

ITB Questions and Answers:

Questions regarding this bid should be emailed to the project administrator listed above by Monday, November 10 at 2:00 pm

Questions and answers will be posted on the Hamblen County website at hamblencountytn.gov under the bids and proposals tab and emailed to all prospective bidders known to the County by Wednesday, November 12 @ 5pm.

All correspondence and communication must be via email to the project administrator. Questions submitted by telephone will not be answered. Questions submitted after the deadline will not be answered.

Proprietary Information and Public Disclosure:

Materials submitted in response to this competitive procurement shall become the property of Hamblen County. All bids submitted will remain sealed until the deadline for submission of bids has expired. Once a bid is submitted to Hamblen County Government and is opened, it constitutes a public record and is subject to the open records request pursuant to the Tennessee Open Records Act.

Bidder Initials_____

Cost of Bid Submission:

The County will not be liable for any costs incurred by any respondent in preparation of a response to this ITB or any other activities related to responding to this ITB.

Revisions to the ITB:

In the event it becomes necessary to revise any part of this ITB, addenda will be produced in writing and submitted to all prospective respondents known to the County and will be listed on the Hamblen County website, www.hamblencountytn.gov, under the Bids and Proposals Tab.

The County reserves the right to cancel or to reissue this ITB in whole or in part prior to the execution of a contract.

Period of Performance:

The period of performance of any work resulting from this ITB is scheduled to begin upon award of the project and issuance of a purchase order. The project **must** be completed within the number of days specified in the bid proposal, starting with the date on the notice to proceed.

Subcontract Terms:

If a subcontractor is to be used, the subcontractor section of the Bid Proposal **must** be completed. Copies of the necessary license for the subcontractor **must** also be submitted with the bid packet.

Contract Terms:

All items in this ITB must be included with the bid submission. All contracts between parties as a result of this ITB shall be governed by and enforced in accordance with the laws of the State of Tennessee. In the event a dispute arises, the venue shall be in Hamblen County, Tennessee. The County shall require the person with authority to bind the company to sign all agreements with the County.

Contract Termination:

The County reserves the right to cancel the contract at any time for breach of contractual obligations without penalty or recourse by giving the contracted firm a written notice of such termination of at least fifteen (15) calendar days prior to said cancellation. Prior to issuing such a notice, the County will, if appropriate, provide the contracted firm with an opportunity to cure the breach within a reasonable period of time. Should the County exercise its right to terminate the contract for such reasons, the termination shall become effective on the date as specified in the notice of termination sent to the contracted firm. The contracted firm shall be entitled to receive just and equitable compensation for the work provided pursuant to the contract prior to the effective date of cancellation.

Bidder Initials_____

No Obligation:

The County reserves the right to accept or reject any or all bid submissions at its sole discretion without penalty and to not issue a contract as a result of this ITB. The County also has the right to waive any formal defects in submissions when deemed in the best interest of the County. Further, the County reserves the right to negotiate with any respondent concerning matters which the County determines require clarification or changes not in conformity with the specific requirements set forth herein.

Right To Withdraw:

Respondents have the right to request a withdrawal of their bids from consideration due to error by giving notice at any time before and not later than two (2) days after submissions are publicly opened.

Commitment of Funds:

The Hamblen County Legislative Body are the only individuals who may legally commit the County to the expenditures of funds for a contract resulting from this ITB. No cost chargeable to the proposed contract may be incurred before receipt of a fully executed contract.

Purchase Order:

The County will issue a purchase order for each individual project for the proposed amount once the Hamblen County Legislative Board has awarded the project. This purchase order number must be referenced on the invoice that is submitted.

Invoice Requirements:

The County will accept two (2) invoices per project, one for materials and the second at the completion of the project. The contract will include 5% retainage. The project engineer must approve all payment applications before the request is paid.

III. SUBMISSION REQUIREMENTS:

Respondents are required to submit one (1) complete bid packet either electronically or in a sealed envelope based on the instructions below. Bids, whether mailed, hand-delivered, or electronically submitted must arrive no later than November 18, 2025 at 2:00 pm

Instructions for Submitting Bids Electronically:

PLEASE READ THOROUGHLY: Electronic submissions should **NOT** be sent directly to anyone at the Mayor's Office, but addressed to Barbara.horton@co.hamblen.tn.us, **VIA 'WE TRANSFER.COM'** an internet-based computer file transfer service. The message line of the WeTransfer page should state**: 2025-2026 Storm Water Projects Bid # TDEC ARP 2022-8540**

Bidder Initials_____

Instructions for Submitting Hard Copies of Bids:

Envelopes **must** arrive **sealed** and clearly **marked** with TDEC ARP 2022-8540 Storm Water Projects Bid on the outside of the envelope to the Hamblen County Mayor's Office, 511 West Second North Street, Morristown, TN 37814, Attention: Barbara Horton.

Respondents assume the risk for the method of delivery chosen. The County assumes no responsibility for delays caused by any delivery service whether in person or electronically. Late bids will not be accepted.

Submission Content:

All items listed below **must** be included in your submission.

1. Bid Proposal Form (attached)
2. Copy of Required License – General Contractor License
3. Exceptions Form (attached)
4. Anti-Collusion Statement (attached)
5. Acknowledgement Regarding Bidder SAM Registration (attached)
6. Certificate of Compliance with Iran Divestment Act (attached)
7. Certification of Compliance with Non-Boycott of Israel Act (attached)
8. State of Tennessee Byrd Anti-Lobbying Amendment Certification (attached)

Bid Proposal Form:

The respondent must complete the bid proposal form. This includes the respondent's contact information, lists of licenses and proposed cost. Also included is the subcontractor section. Respondents should complete the information requested for any subcontractor to be used in this project. If there will not be a subcontractor used, then the "No Subcontractors" section should be marked.

Bidder Initials_____

Insurance Requirements:

a. Certificates of Insurance

Upon award of the contract for this bid, the chosen firm **must** provide to the County certificates of the insurance requirements listed below **before** the contract is executed and duties commence. Policies must be endorsed to provide the County at least 30 days written notice of reduction, cancellation or intent not to renew coverages as listed below. If insurance is canceled, reduced, non-renewed or otherwise is not in effect to the minimum required coverage, the contracted firm **must** cease work on this project.

b. Liability Coverages

1. The chosen firm must furnish at their own expense and keep in full force during the terms of this contract the following coverages which **must** list Hamblen County Government as an additional insured:

- Insurance covering bodily injury in the minimum sum of $1,000,000 for each occurrence
- Insurance covering property damage in the minimum sum of $1,000,000 for each occurrence, $2,000,000 aggregate
- Automobile liability insurance in the minimum of $1,000,000 combined single limit for bodily injury and property damage.

2. The Contractor's commercial general liability policy shall not contain an exclusion or restriction of coverage for the following:

- Claims for property damage to the Contractor's work arising out of the products-completed operations hazard where the damaged work or the work out of which the damage arises was performed by a subcontractor.

c. Worker's Compensation Compliance

The chosen firm must also comply with all requirements of the Workers' Compensation Law and must at their own expense, maintain such insurance including employer's liability, as will protect him from claims under said law and from any other claims for personal injuries, including death which may arise from the operations under the contract, whether operations be by himself or anyone directly or indirectly employed by him.

d. Subcontractor Insurance

Contractor shall cause each subcontractor employed by the Contractor to purchase and maintain insurance of the type specified above. When requested by the County, Contractor shall furnish copies of certificates of insurance evidencing coverage for each subcontractor.

Bidder Initials_____

Exceptions Form:

The exceptions form listed on page 12 of this document give options of "NO EXCEPTIONS TAKEN" **or** "BIDDER TAKES EXCEPTIONS'. One of these should be selected and submitted with the sealed bid.

If a bidder **has** exceptions to the scope of services listed in this document, they must be listed on the exceptions form.

If the bidder **has no** exceptions to the scope of services listed in this document, they should indicate so by selecting, "NO EXCEPTIONS ARE TAKEN" on the exceptions form.

Anti-Collusion Statement:

The respondent certifies by signing the anti-collusion statement that this bid is made without prior understanding, agreement, or accord with any other person submitting bids for the same service and that this submission is in all respects bona fide, fair and not the result of any act of fraud or collusion with another person engaged in the same line of business or commerce.

Iran Divestment Act:

The respondent must certify that neither they nor any of their successors, parent companies, subsidiaries or companies under common ownership or control certifies, under penalty of perjury, that to the best of their knowledge and belief that they are not on the list created pursuant to Tennessee Code Annotated § 12-12-106.

Signatures:

The Exceptions Form, Anti-Collusion Statement, Certification of Compliance with the Iran Divestment Act, Certification of Compliance with Non-Boycott of Israel Act and all ITB Amendments **must** be signed and dated by a person authorized to legally bind the respondent to a contractual relationship.

Bidder Initials_____

IV. FORMS:

a) BID PROPOSAL

Information of company or individual with whom the contract would be written	
Company Legal Name:	
Address:	
Phone:	
Primary Point-of-Contact Email Address:	
State of Tennessee General Contractor License Number – **Include copy of license with bid**	

If any subcontractors are to be used on this project, their information **must** be listed below. If no subcontractors will be used indicate that below by selecting the option, "NO SUBCONTRACTORS WILL BE USED IN THIS PROJECT".

Subcontractor Information:	
Company Legal Name:	
Address:	
Phone:	
Primary Point-of-Contact Email Address:	
List any Tennessee license held relevant to this project:	

NO SUBCONTRACTORS WILL BE USED IN THIS PROJECT:	

Bidder Initials_____

BID PROPOSAL continued…

Total Cost Proposed for Scope of Services as Listed in this Document

$ _____

Project Name	Project #	Material	Labor	Project Cost	# of Days
Deerwood Shadows	SW PD C 1				
Meadows	SW PD C 2				
Brady Drive	SW PD C 3				
	Totals				

Bidder Initials_____

b) EXCEPTIONS FORM

Bidder MUST sign the appropriate statement below, as applicable.

☐ Bidder understands and agrees to all terms, conditions, requirements and specifications stated herein. NO EXCEPTIONS ARE TAKEN.

FIRM NAME:	
AUTHORIZED REPRESENTATIVE: (printed)	
AUTHORIZED REPRESENTATIVE: (signature)	
DATE:	

☐ Bidder takes exception to the following terms, conditions, requirements and specifications stated herein.

FIRM NAME:	
AUTHORIZED REPRESENTATIVE: (printed)	
AUTHORIZED REPRESENTATIVE: (signature)	
DATE:	
EXCEPTIONS TO NOTE:	

Bidder Initials_____

c) ANTI-COLLUSION STATEMENT

By signing this form, the respondent agrees that he/she has not divulged to, discussed, or compared his/her submission with other respondents and has not colluded with any other respondent whatsoever. Note: no premiums, rebates or gratuities to any employee or agent are permitted with, prior to, or after any delivery of service. Any such violation will result in any contract related to this ITB being null and void and could constitute a felony and result in a fine, imprisonment and civil damages.

The undersigned certifies that he/she has read, understands, and agrees to all terms, conditions, and requirements of this ITB, and is authorized to enter into a contract with Hamblen County Government. This form must be signed personally by the respondent or the respondent's authorized agent. All signatures must be original.

Signature	Title
Printed Name	Date

By signing this form, the respondent signifies understanding and agreement with Hamblen County Government's Terms and Conditions.

Bidder Initials_____

ACKNOWLEDGEMENT REGARDING BIDDER SAM REGISTRATION

Pursuant to 2 CFR Parts 183 and 215 and the requirement of the U.S. Department of Housing and Urban Development (HUD), contractors procured directly by grantees, sub-grantees, and/or sub-recipients of HUD funds, including CDBG are required to have an active registration in the System of Award Management (SAM). This document shall be completed and submitted as part of the bid proposal.

1. By submitting this proposal, the prospective bidder acknowledges that it must have an active SAM UEI (Unique Entity ID) to be awarded this contract and that without an active SAM UEI the bidder's proposal may be disallowed.

2. By submitting this proposal, the prospective bidder certifies neither it, its principals nor affiliates, is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

3. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that an erroneous certification was rendered, in addition to other remedies available to the Federal Government, the Department or agency with which this transaction originated may pursue available remedies.

4. Further, the prospective bidder shall provide immediate written notice to the person to which this proposal is submitted if at any time the Participant learns that this certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

5. By submitting this proposal, it is agreed that should the proposed covered transaction be entered into, the prospective bidder will not knowingly enter into any lower-tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction unless authorized by the agency with which this transaction originated.

6. It is further agreed that by submitting this proposal, the prospective bidder will include Certification of Subcontractor Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion without modification, in all lower-tier covered transactions and in all solicitations for lower-tier covered transactions.

Provide the following information as detailed in the prospective bidder's SAM registration:

Entity Name: _____

Address: _____

City: _____ State: _____ Zip: _____

SAM Entity ID: _____ Expiration Date: _____

Active Exclusions: ☐ Yes ☐ No

Bidder Initials_____

IRAN DIVESTMENT ACT

In compliance with the Iran Divestment Act (State of Tennessee 2016, Public Chapter No. 817), which became effective on July 1, 2016, certification is required of all bidders on contracts over $1,000.

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party hereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to T.C.A. § 12-12-106.

I affirm, under the penalties of perjury, this statement to be true and correct.

_____ _____

Date Signature of Bidder

_____ _____

Company

A bid shall not be considered for award nor shall award be made where the foregoing certification has been complied with; provided, however, that if in any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefor. The **City/County of** _____ may award a bid to a bidder who cannot make the certification, on case-by-case basis, if:

1. The investment activities in Iran were made before July 1, 2016, the investment activities in Iran have not been expanded or reviewed on or after July 1, 2016, and the person has adopted, publicized, and is implementing a formal plan to cease the investment activities in Iran and to refrain from engaging in any new investments in Iran; or
2. The **City/County of** _____ makes a determination that the goods or services are necessary for the **City/County of** _____ to perform its functions and that, absent such an exemption, the political subdivision will be unable to obtain the goods or services for which the contract is offered. Such determination shall be made in writing and shall be a public document.

Bidder Initials_____

CERTIFICATION OF NON-BOYCOTT OF ISRAEL

The Bidder certifies that it is not currently engaged in and will not for the duration of the contract engage in, a boycott of Israel as defined by Tenn. Code Ann. § 12-4-119. This provision shall not apply to contracts with a total value of less than two hundred fifty thousand dollars ($250,000) or to contractors with less than ten (10) employees.

According to the law, a boycott of Israel means engaging in refusals to deal, terminating business activities, or other commercial actions that are intended to limit commercial relations with Israel, or companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel to do business, or persons or entities doing business in Israel, when such actions are taken:

1) In compliance with, or adherence to, calls for a boycott of Israel, or

2) In a manner that discriminates on the basis of nationality, national origin, religion, or other unreasonable basis, and is not based on a valid business reason. Tenn. Code Ann. § 12-4-119.

I certify this statement to be true and correct.

_____ _____

Bidder Name Printed Date

_____ _____

Signature of Bidder Company

Bidder Initials_____

STATE OF TENNESSEE

BYRD ANTI-LOBBYING AMENDMENT CERTIFICATION

Contractors who apply or bid for an award of $100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING – REQUIRED FOR CONTRACTS OVER $100,000 *Certification for Contracts, Grants, Loans, and Cooperative Agreements*

The undersigned certifies, to the best of his or her knowledge and belief, that:

☐ No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

☐ If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

☐ The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

Bidder Initials_____

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The Contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Authorized Representative	**Date**
Printed Name and Title	**Phone Number/ Email Address**

Bidder Initials_____

V. ITB SUBMISSION CHECKLIST:

- ☐ Bid packet is labeled on the outside of the envelope or in the message line if submitted electronically, 2025-26 Storm Water Projects Bid # TDEC ARP 2022-8540.
- ☐ Complete ORIGINAL signed and initialed ITB packet
- ☐ Bid Proposal Form completed.
- ☐ Copy of Required License – General Contractor License
- ☐ Exceptions Form completed and signed.
- ☐ Anti-Collusion Statement Signed.
- ☐ Certification of Compliance with Iran Divestment Act completed and signed.
- ☐ Certification of Compliance with Non-Boycott of Israel Act completed and signed.
- ☐ Acknowledgement of Bidder SAM Registration completed and signed.
- ☐ Certification of Byrd Anti-Lobbying Amendment completed and signed.

Bidder Initials_____

TECHNICAL

SPECIFICATIONS

Hamblen County Stormwater

TDEC ARP #2022-8540

Hamblen County, Tennessee

Contract No. 24-16

ProE Engineering Services, LLC, 112 Newport Drive, Oak Ridge, TN 37830

TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

011000 SUMMARY
011200 SPECIAL CONDITIONS
012000 MEASUREMENT AND PAYMENT
012200 UNIT PRICES
012600 CONTRACT MODIFICATION PROCEDURES
012900 PAYMENT PROCEDURES
013100 PROJECT MANAGEMENT AND COORDINATION
013300 SUBMITTAL PROCEDURES
014000 QUALITY REQUIREMENTS
017000 EXECUTION REQUIREMENTS
017005 MOBILIZATION
017700 CLOSEOUT PROCEDURES
017839 PROJECT RECORD DOCUMENTS

DIVISION 2 - GENERAL REQUIREMENTS

02050 DEMOLITION
02200 EARTHWORK
02211 CLEARING & GRUBBING
02212 BORROW
02213 WASTE MATERIAL DISPOSAL
02230 MINERAL AGGREGATE BASE
02241 SUBGRADE
02271 RIP RAP
02510 BITUMINOUS PAVING
02720 DRAINAGE MATERIALS
02722 MINOR DRAINAGE STRUCTURES
02905 RESTORATION OF SURFACES
02921 TOPSOIL
02931 SEEDING, FERTILIZING & MULCHING
02933 JUTE THATCHING

SECTION 011000 SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work restrictions.
4. Specification and drawing conventions.

1.3 PROJECT INFORMATION

A. Project Identification: Hamblen County Stormwater, TDEC ARP #2022-8540

B. Project Location: Hamblen County, Tennessee

C. Owner: Hamblen County, Tennessee

1. Owner's Representative: Chris Cutshaw, Mayor
511 West Second North Street, Morristown, TN 37814

D. Engineer: ProE Engineering Services, LLC, 112 Newport Drive, Oak Ridge, TN 37830

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Miscellaneous storm drainage improvements within Hamblen County.

B. Type of Contract

1. Project will be completed under a single prime contract.

1.5 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in any existing building to the facility's normal business working hours, except as otherwise indicated or approved by the Owner. All other work on site shall be conducted in accordance with the requirements of the General Conditions.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Engineer not less than three (3) business days in advance of proposed utility interruptions.
2. Obtain Engineer's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1. Notify Engineer not less than 3 business days in advance of proposed disruptive operations.
2. Obtain Engineer's written permission before proceeding with disruptive operations.

1.6 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 33-division format and CSI/CSC's "Master Format" numbering system.

1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.

2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

    a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by common industry abbreviations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 011200 SPECIAL CONDITIONS

PART 1: GENERAL

1.1 SUMMARY OF WORK

A. The Project generally consists of miscellaneous storm drainage improvements at multiple sites within Hamblen County.

1.2 PROJECT PAYMENTS AND RETAINAGE

A. The Owner may retain a portion of the amount otherwise due the Contractor. Except as provided elsewhere, the amount retained by the Owner shall be limited to the following:

1. Withholding of not more than 5% of the payment claimed until work is substantially complete.

2. When the work is substantially complete (operational or beneficial occupancy), the withheld amount may be further reduced below 5% to only that amount necessary to assure completion.

3. The Owner may accept securities negotiable without recourse, conditions or restrictions, a release of retainage bond or an irrevocable letter of credit provided by the Contractor in lieu of all or part of the cash retainage.

B. For unit price projects, the Contractor shall use the "Unit Bid Item Summary" form included with these specifications.

C. Sales Tax Statement: When requested by the Owner, each request for progress payment submitted by the Contractor shall include a sales tax reimbursement statement. The Contractor shall utilize the form provided with these specifications.

1.3 PRODUCT REQUIREMENTS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

4. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

5. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article below to obtain approval for use of an unnamed product.

B. Warranties specified in other Sections shall be in addition to, and run concurrent with other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by, or incorporated into, the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 DELIVERY, STORAGE AND HANDLING

A. The Contractor shall be responsible for delivery, storage and handling of all materials and equipment, unless otherwise noted. All material and equipment shall be shipped to arrive at the job site on the dates indicated on the purchase order. The following information shall be supplied:

1. The contents and bill of lading, number of shipments.

2. The method of shipments.

3. The date of shipment.

4. The name of the construction project.

B. Prior to shipment, all items shall be properly prepared to protect all critical areas from the effects of weather, normal expected transport and on site handling.

C. Items shall be tagged and marked with equipment and/or motor numbers as per the manner stipulated in the purchase order.

D. All spare parts and expendable supplies shall be properly crated, marked, and shipped to the job site on the date specified.

1.5 PERMITS

A. General: The Owner and Engineer will obtain and provide the appropriate permits necessary for the Contractor's execution of the proposed project. All provisions of these permits and arrangements are in accordance with the policies and procedures of each agency and are hereby incorporated into these contract documents.

B. General: The Owner and Engineer will obtain and provide the appropriate permits necessary for the Contractor's execution of the proposed project. All provisions of these permits and arrangements are in accordance with the policies and procedures of each agency and are hereby incorporated into these contract documents.

C. The Owner will provide the Authorization to Construct issued by the Tennessee Department of Environment & Conservation (TDEC) for the proposed facilities, as well as the associated Construction Start Notification from the Owner. Refer to the Appendices of these contract documents for a copy of the written permit and any associated requirements.

D. The Owner will provide the appropriate permit documents and plan approval documentation for the Erosion and Sedimentation Control plan as issued by TDEC for the proposed facilities. Refer to the Appendices of these contract documents for a copy of the written permit and any associated requirements. The Owner will provide the appropriate 401/404 stream and wetlands permit documentation, as issued by USACE, and Aquatic Resource Alteration Permit (ARAP) as issued by TDEC. Refer to the Appendices of these contract documents for a copy of the written permit and any associated requirements.

E. The Owner will provide the right-of-way encroachment agreement from the Tennessee Department of Transportation (TDOT) for all work occurring within their right-of-way. Refer to the Appendices of these contract documents for a copy of the encroachment agreement and any associated special conditions.

F. The Owner will provide the right-of-way encroachment agreement from any applicable railroad for all work occurring within their right-of-way. Refer to the Appendices of these contract documents for a copy of the encroachment agreement and any associated special conditions.

G. The Contractor shall obtain and pay for all construction permits as specified in the General Conditions.

1. All necessary building permits, electrical permits, fees, or licenses required by the Contractor from the city, county, or state in connection with this project shall be obtained by the Contractor and at the expense of the Contractor.

PART 2: PRODUCTS

2.1 EQUIPMENT AND MATERIAL STANDARDS

A. All equipment and materials of construction described in this specification shall meet the more stringent requirements of the applicable codes listed below:

1. OSHA - Occupational Safety and Health Administration.
2. ASTM - American Society for Testing Materials.
3. ANSI - American National Standards Institute.
4. AGMA - American Gear Manufacturers Association.
5. AISC - American Institute of Steel Construction.
6. AWS - American Welding Society.
7. NEC - National Electric Code.
8. NEMA - National Electrical Manufacturers Association.
9. API - American Petroleum Institute.

2.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference. In all cases, the standards referenced within these Contract Documents shall be construed to reference the most current version, amendment or applicable replacement pertaining to the work.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

2.3 QUALITY ASSURANCE

A. All equipment shall, after installation by the Contractor, shall be inspected, tested and started up by a qualified representative of the equipment manufacturer. The Contractor and the manufacturer's representative shall complete the "Equipment Start-up Form" provided at the end of this section and submit the completed form to the Engineer.

B. The listing of a manufacturer in the specifications does not necessarily imply that the manufacturer's standard equipment meets the requirements of the specifications, but that the manufacturer listed has the capability to meet the requirements of the specifications.

PART 3: EXECUTION

3.1 SPECIAL REQUIREMENTS

A. Limits of Construction: The Contractor shall confine all operations and personnel to the limits of construction as shown on the plans. There shall be no disturbance whatsoever of any areas outside the limits of construction nor shall the workmen be allowed to travel at will through the surrounding private property.

B. Construction Superintendent: The Contractor shall place in charge of the work a competent and reliable superintendent, who shall have the authority to act for the Contractor and who shall be accountable to the Engineer. The Contractor shall, at all times, employ labor and equipment sufficient to accomplish the several classes of work to full completion in the manner and time specified.

C. Site Conditions:

1. The Contractor shall maintain the work and project grounds free from rubbish, debris and waste materials during all phases of the work.

2. Immediately upon completion of the work and prior to final acceptance, the Contractor shall remove all rubbish, debris, temporary structures, equipment, excess or waste materials and shall leave the work and project grounds in a neat and orderly condition that is satisfactory to the Engineer and Owner.

D. Right of Entry: The Engineer and his representative will at all times have access to the work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

E. Temporary Construction Services and Facilities: The Contractor shall obtain all necessary permits, licenses, etc. and shall pay all costs incident to the furnishing, installing and maintenance of temporary utility services and facilities required for the duration of the work.

F. Quantities of Estimate: The estimated quantities of work to be done and materials to be furnished under this Contract shown in any of the documents, including the proposal, are given for use in comparing bids and to indicate approximately the total amount of the contract; and the right is especially reserved, except as herein otherwise specifically limited to, to increase or diminish the quantities as may be reasonably necessary or desirable by the Owner to complete the work contemplated by this Contract.

G. Utility Coordination: The Contractor shall make all necessary arrangements with private and public utility companies to avoid any possible damage to or interruption of utility equipment or service. The Contractor shall be responsible for all inquiries concerning locations of utility lines. Repair of any damage to public or private utilities resulting from this work shall be the responsibility of the Contractor.

H. Construction Surveying: All work shall be constructed in accordance with the lines, grades and elevations shown on the plans or as given by the Engineer in the field. The Contractor shall be fully responsible for maintaining alignment and grade. All principal controlling points and base lines for locating the principal components of the work together with a suitable number of benchmarks adjacent to the work will be provided by the Engineer. From this information, the Contractor shall verify benchmarks and develop and make all detail surveys needed for construction. The Contractor shall protect and safeguard all points, stakes, grade marks, monuments, and benchmarks at the site of the work and shall re-establish, at his own expense, any marks which are removed or destroyed due to his construction operations.

I. Laying Out Work:

    1. It is imperative that the Contractor work within the shown rights of way or easements at all times, unless approved otherwise by the property owner and the Engineer.

    2. The Contractor shall, at his expense, provide competent engineering survey services and shall provide and maintain accurate, detailed, survey work.

    3. The plans and supplementary drawings shall not be scaled and the Contractor must verify all dimensions and elevations at the site prior to proceeding with the work. The Contractor shall also verify existing utility locations prior to purchasing materials affected by these locations.

J. Use of Explosives:

    1. If the use of explosives is necessary for the execution of the work, the Contractor shall exercise the utmost care not to endanger life or property. The Contractor shall be responsible for any and all damage or injury to persons or property resulting from the use of explosives. Such responsibility shall include, but shall in

no way be limited to, all damages arising from all forms of trespass to adjacent property as a result of blasting by the Contractor.

2. All explosives shall be stored in a secure manner, in compliance with all laws, and all such storage places shall be marked clearly "DANGEROUS EXPLOSIVES".

K. Use of Chemicals: All chemicals used during project construction, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in conformance with instructions.

L. Safety and Health Regulations:

1. The Contractor shall comply with all Federal, State and Local Safety and Health Regulations including the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (P.L. 91 - 596) and under Section 107 of the Contract Work Hours and Safety Standards Act (P.L. 91-54).

2. The Contractor shall provide continuous, safe access to all properties, both public and private, along the project in all cases where such access will be provided by the completed facility and shall conduct his operations in such a manner that inconvenience to the property owners will be held to a minimum.

M. Equipment and Material Storage: The Contractor shall plan his activities so that all materials and equipment can be stored within the project limits. There shall be no disturbance whatsoever of any areas outside the project limits without the prior approval of the Engineer.

N. Disturbed Areas: All areas disturbed as a result of the work of the Contractor shall be restored to the original or better condition. Reasonable care shall be taken during construction to avoid damage to the Owner’s property or that of any adjacent property owner(s).

O. Tree and Plant Protection: No trees or shrubs except those specifically indicated, shall be removed or trimmed without prior approval from the Engineer. All trees and shrubs within the construction limits to be retained by the Owner shall be properly protected by fencing, posts or other means approved by the Engineer. Where any trees or shrubs are damaged or where limbs are required to be trimmed or removed because of operations under this Contract a qualified horticulturist shall be consulted and the trimming performed in the proper manner. Any landscape plantings severely damaged or which die as a result of the Contractor's operations shall be replaced at no additional cost to the Owner.

P. Temporary Sanitary Facilities: The Contractor shall be solely responsible for furnishing and maintaining temporary sanitary facilities during the construction period. Such facilities shall include but not be limited to, potable water supply and toilet facilities. Such facilities shall be in compliance with all applicable state and local laws, codes, and ordinances and shall be placed convenient to work stations and secluded from public observation. Once the project is completed all temporary sanitary facilities shall be removed by the Contractor.

Q. Traffic Maintenance:

1. The Contractor shall provide, erect, and maintain all necessary barricades, suitable and sufficient warning lights, danger signals, and signs, shall provide a sufficient number of flagmen to direct the traffic and shall take all necessary precautions for the protection of the work and the safety of the public.

2. All barricades and obstructions or hazardous conditions shall be illuminated as necessary to provide for safe traffic conditions.

3. Warning and caution signs shall be posted throughout the length of any portion of the project where traffic flow is restricted.

R. Photographic Documentation:

1. General: The Contractor shall produce photographic documentation of the entire project work area prior to placing any materials or equipment on site and prior to any construction. The photographic documentation shall adequately condition and location of existing features that could be impacted as a result of construction.

2. Cost: The cost for photographic documentation services shall be considered incidental to the work and shall be included in the bid. No separate payment will be made for photographic documentation.

3. Construction Photographs: Submit one (1) copy of each photographic view within seven (7) days of taking photographs.

    a) Submit all photographs in digital .jpg format or as agreed upon at the preconstruction conference.

    b) All photographs shall be at an image resolution of not less than 3000 x 2000 pixels and 300 ppi.

    c) All photographs shall be appropriately labeled with the name of the project, name of the contractor and date photographs were taken.

4. Video Recordings: Submit one (1) copy of each high-resolution digital video recording within seven (7) days of recording.

    a) Submit all video recordings in digital video format acceptable to Engineer as agreed upon at the preconstruction conference.

    b) All video recordings shall be appropriately labeled with the name, of the project, name of the contractor and date that the video recording was performed.

5. Usage Rights: Contractor shall transfer any applicable copyright usage rights to Owner for unlimited reproduction of photographic documentation.

6. Additional Photographs and Video Recordings: Engineer may request photographs or video recordings in addition to those required prior to construction.

END OF SECTION 011200

SECTION 012000 MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.1 SCOPE

A. This section covers the method of measurement and payment for items of work under this contract.

1.2 GENERAL

A. The total Bid Price for each section of the contract shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work including furnishing all materials, equipment, supplies, and appurtenances; providing all construction plant, equipment, and tools; and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the Bid Form shall be considered a subsidiary obligation of the Contractor and all costs in connection therewith shall be included in the prices bid.

1.3 ESTIMATED QUANTITIES

A. All estimated quantities stipulated in the Bid Form or other Contract Documents are approximate and are to be used only a) as a basis for estimating the probable cost of the work and b) for the purpose of comparing the bids submitted for the work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. In some cases a unit price item has been added to the bid schedule for the purpose of establishing a cost basis in the event work associated with that item is required. No guarantee is expressed or implied that the quantities shown in the bid schedule shall be required to fulfill the Contract. The basis of payment for work and materials will be the actual amount of work done and materials furnished. The Contractor agrees that he will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts thereof.

1.4 WORK ITEMS

A. The following describes the method of measurement and payment for the bid items shown in the Bid Schedule.

1. Mobilization: Partial payments for the item "Mobilization" will be made with the first and second partial pay estimates paid on the contract, and will be made at the rate of 50% of the lump sum price for "Mobilization" on each of these partial pay estimates. The amount for “Mobilization” in the approved schedule of values shall

not exceed 5% of the total of all other bid schedule line items. Mobilization shall include all costs for Contractor's bonds, insurance, temporary office facilities, sanitary and power, and all other miscellaneous costs.

2. Walking Trail Overlay:

    a) This item will be paid in accordance with the unit price listed in the Bid Schedule. This unit price will be the full compensation for all work and materials, including cleaning, tack coat application, and asphalt overlay as indicated on the Drawings or specified in the Contract Documents. This shall include any necessary asphalt tapering at overlay terminations to maintain flush transitions.

    b) Payment shall be made on a unit price basis for all work. Payment will be made based on the two-dimensional area fully completed, as described in the contract documents and otherwise directed by the Engineer. No payment will be made for areas that were not pre-approved.

3. Walking Trail Repair:

    a) This item will be paid in accordance with the unit price listed in the Bid Schedule. This unit price will be the full compensation for all work and materials, including sawcut and removal of existing trail, proper offsite disposal of removed material, compaction of subgrade, and installation of new trail pavement section as indicated on the Drawings or specified in the Contract Documents. This shall include any necessary asphalt tapering at overlay terminations to maintain flush transitions.

    b) Payment shall be made on a unit price basis for all work. Payment will be made based on the two-dimensional area fully completed, as described in the contract documents and otherwise directed by the Engineer. No payment will be made for areas that were not pre-approved.

4. Drive and Parking Overlay:

    a) This item will be paid in accordance with the unit price listed in the Bid Schedule. This unit price will be the full compensation for all work and materials, including cleaning, tack coat application, and asphalt overlay as indicated on the Drawings or specified in the Contract Documents. This shall include any necessary asphalt tapering at overlay terminations to maintain flush transitions.

    b) Payment shall be made on a unit price basis for all work. Payment will be made based on the two-dimensional area fully completed, as described

in the contract documents and otherwise directed by the Engineer. No payment will be made for areas that were not pre-approved.

5. Pavement Striping:

    a) This item will be paid in accordance with the unit price listed in the Bid Schedule. This unit price will be the full compensation for all work and materials, including cleaning and pavement striping, as indicated on the Drawings or specified in the Contract Documents. This shall include any necessary asphalt tapering at overlay terminations to maintain flush transitions.

    b) Payment shall be made on a unit price basis for all work. Payment will be made based on the linear footage of four inch (4") wide painted striping, as described in the contract documents and otherwise directed by the Engineer. Pavement striping is to be installed only where prior striping existed and was appropriately documented or where directed Owner or Engineer. No payment will be made for areas that were not pre-approved.

1.5 ALL OTHER WORK ITEMS

A. All other work items not covered in part 1.4 shall be considered incidental to other work items that have unit or lump sum prices. Therefore no separate payment shall be made for these work items.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION (NOT USED)

END OF SECTION 012000

SECTION 012200 UNIT PRICES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Sections:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

2. Division 1 Section "Quality Requirements" for general testing and inspection requirements.

1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modifications, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to the Bid Schedule for work that requires establishment of unit prices. The Specification Section entitled "Measurement and Payment" describes the methods of measurement and payment for the unit prices in the Bid Form.

1.5 ADJUSTMENT OF QUANTITIES

A. Unit Quantity Adjustment: To adjust unit quantities, prepare a Change Order Proposal based on the difference between the final measurement of work-in-place and the estimated quantity contained in the Bid Schedule, multiplied by the unit price for that item.

1. Submit substantiation of the change of scope of work, if any, claimed in Change Orders related to the unit price work.

2. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 012200

SECTION 012600 CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.3 MINOR CHANGES IN THE WORK

A. Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.

2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a) Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

    b) Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

    c) Include costs of labor and supervision directly attributable to the change.

d) Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

e) Quotation Form: Use forms acceptable to Engineer.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

4. Include costs of labor and supervision directly attributable to the change.

5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Proposal Request Form: Use form acceptable to Engineer.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit Price Adjustment: Refer to Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Engineer will issue a Change Order for signatures of Owner and Contractor.

1.7 WORK CHANGE DIRECTIVE

A. Work Change Directive: Engineer may issue a Work Change Directive. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

    1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.

    1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PRODUCTS (Not Used)

EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections:

1. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.

2. Division 01 Section "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule. A cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the Schedule of Values.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

a) Application for Payment forms with continuation sheets.

b) Submittal schedule.

c) Items required to be indicated as separate activities in Contractor's Construction Schedule.

2. Submit the Schedule of Values to Engineer at earliest possible date but no later than 7 days prior to the date scheduled for submittal of the initial Applications for Payment.

3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

4. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values correlated with each element.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values.

1. Identification: Include the following Project identification on the schedule of values:

    a) Project name and location.

    b) Name of Engineer.

    c) Engineer's project number.

    d) Contractor's name and address.

    e) Date of submittal.

2. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

    a) Related Specification Section or Division.

    b) Description of the Work.

    c) Name of subcontractor.

    d) Name of manufacturer or fabricator.

    e) Name of supplier.

    f) Dollar value as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide multiple line items for principal contract amounts as appropriate which include separate costs for items such as shop drawings, and project closeout items such as, but not limited to demobilization, project restoration and final cleanup, furnishing Operation and

Maintenance manuals, punch list activities, equipment demonstration, operator training and Project Record Documents.

4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

    a) Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

6. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

8. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a) Temporary facilities and other major cost items that are not direct cost of actual work-in-place shall be proportionately applied to other line items in the Schedule of Values.

9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.

    1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Progress payments shall be submitted to Engineer by a specific day of the month to be established at the pre-construction conference. The period covered by each Application for Payment is one month, ending on the specific day of the month that is established at the pre-construction conference.

C. Application for Payment Forms: Use forms acceptable to Engineer.

D. Application Preparation: Complete every entry on form. Execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's Construction Schedule. Use updated schedules if revisions were made.

2. Include amounts for all work completed since the previous Application for Payment by including amounts for all work completed on the project and subtracting those quantities included on previous Applications for Payment. Include only amounts for work completed through the cut-off date established at the pre-construction conference.

3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.

2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

3. Provide summary documentation for stored materials indicating the following:

a) Materials previously stored and included in previous Applications for Payment.

b) Work completed for this Application utilizing previously stored materials.

c) Additional materials stored with this Application.

d) Total materials remaining stored, including materials with this Application.

4. Reimbursement for stored materials shall not exceed 50 percent of the unit price bid for the associated line item or as shown in the Schedule of Values for that portion of the work, unless otherwise agreed upon by the Engineer and Owner.

F. Transmittal: Submit [one] 1 signed and notarized copy of each Application for Payment to Project Coordinator via email. This copy shall include waivers of lien and similar attachments if required.

    1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

    1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

    2. When an application shows completion of an item, submit conditional final or full waivers.

    3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

    4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

    5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

    1. List of subcontractors.

    2. Schedule of Values.

    3. Contractor's construction schedule.

    4. Sales tax statement (as necessary)

    5. Combined Contractor's construction schedule incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.

    6. Products list.

    7. Schedule of unit prices.

    8. Submittal schedule.

    9. List of Contractor's staff assignments.

10. List of Contractor's principal consultants.

11. Copies of building permits.

12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

13. Any other requirements described in the General Conditions of the Contract.

I. Progress Applications for Payment: Administrative actions and submittals that must precede or coincide with submittal of each Progress Application for Payment include the following:

    1. Updated Schedule of Values.

    2. Updated Contractor's construction schedule.

    3. Sales tax statements (as necessary).

    4. Certified payroll statements (as necessary).

    5. Summary of stored materials.

    6. Any other requirements described in the General Conditions of the Contract.

J. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

    1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

    2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

    3. Any other requirements described in the General Conditions of the Contract.

K. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

    1. Evidence of completion of Project closeout requirements.

    2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.

3. Updated final statement, accounting for final changes to the Contract Sum (Final Adjusting Change Order issued by Engineer).
4. Contractor's Affidavit of Release of Liens.
5. Consent of Surety to Final Payment.
6. Evidence that claims have been settled.
7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
8. Final liquidated damages settlement statement.
9. Record Documents.
10. General warranty letter.
11. Sales tax statements (as necessary).
12. Any other requirements described in the General Conditions of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.

2. Administrative and supervisory personnel.

3. Coordination drawings.

4. Requests for Information (RFIs).

5. Project meetings.

B. Related Sections:

1. Division 01 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI (Request for Information): Request from Contractor seeking information and clarification from the Engineer during construction.

1.4 COORDINATION

A. Coordination: The Contractor shall coordinate its construction operations with those of others to ensure efficient and orderly installation of each part of the Work. The Contractor shall be responsible for the coordination of each of their subcontractors' schedules. Contractor and each subcontractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

1.5 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately upon discovery of the need for additional information, interpretation, or clarification of the Contract Documents, Contractor shall prepare and submit an RFI.

1. RFIs shall originate with Contractor. Engineer will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.

2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name, including Owner.
2. Date.
3. Name of Contractor.
4. Name of Engineer.
5. RFI number, numbered sequentially.
6. RFI subject.
7. Specification Section number and title and related paragraphs, as appropriate.
8. Drawing number and detail references, as appropriate.
9. Field dimensions and conditions, as appropriate.

10. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
11. Contractor's signature.
12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form acceptable to Engineer.

D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven (7) working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:
    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for coordination information already indicated in the Contract Documents.
    d. Requests for adjustments in the Contract Time or the Contract Sum.
    e. Requests for interpretation of Engineer's actions on submittals.
    f. Incomplete RFIs or inaccurately prepared RFIs.

2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.

3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.

E. Upon receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven (7) days if Contractor disagrees with response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Contractor shall be prepared to discuss the log and the status of pending RFIs at all Progress or Coordination Meetings.

G. Improper or Frivolous RFI: Improper and/or Frivolous RFI's shall be defined as RFI's that request information that is clearly indicated on or reasonably inferable from Contract Documents.

1. Will be returned unanswered, will be removed from the Contractor's RFI log, and the number assigned will be assigned to subsequent RFI.

2. At the Contractor's request, after notification by Engineer that a RFI is improper or frivolous, the RFI will be processed with processing costs charged to Contractor as follows:

a. The Contractor shall reimburse the Owner for the Engineer's account for time spent in processing improper or frivolous RFI's at the rate of the Engineer's current standard hourly fee schedule for personnel and associated expenses.

1.6 PROJECT MEETINGS

A. General: Engineer will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.

2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Engineer will record significant discussions and agreements achieved and distribute the meeting minutes to everyone concerned, including Owner and Contractor.

B. Preconstruction Conference: Engineer will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.

2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress of the work.

4. Minutes: Engineer will record and distribute meeting minutes.

C. Coordination Meetings: Engineer will conduct Project Coordination meetings as necessary. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of the previous Coordination Meeting. Review other items of significance that could affect progress. Topics for discussion at these meetings will be determined as necessary based on the status of Project.

3. Contractor's Construction Schedule: Review progress since the last Coordination Meeting. Determine whether contract is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

    a. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

    b. Review present and future needs of each entity present, including the following:
        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site utilization.
        8) Temporary facilities and controls.
        9) Work hours.
        10) Hazards and risks.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Change Orders.

4. Reporting: Engineer shall record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013300 SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS

A. This section specifies the methods and requirements for the submissions applicable to Shop drawings, Working drawings, Product data, Samples, Request for substitutions, Test procedures, and Construction and Submittal schedules. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Specification Sections, apply to this Section.

B. All submittals shall be clearly identified by reference to the Specification Section, Paragraph, Drawing number, or Detail as applicable.

C. All submittals shall be submitted by the Contractor and the Contractor shall be solely responsible for the coordination and management of all submittals. No submittals received directly from material/equipment suppliers or subcontractors will be accepted unless otherwise agreed upon by all parties. The Engineer's review comments and markup submittals will be returned to the Contractor who shall promptly coordinate and return the comments and markup submittals to the appropriate parties.

D. The Contractor shall submit to the Engineer a detailed submittal schedule in accordance with the General Conditions.

E. The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment, and method of work shall be a described in the submittal. Submittal documents shall be edited to clearly show only those items to be included in the contract. All extraneous materials shall be crossed out or otherwise obliterated. The Contractor shall be solely responsible for the coordination of submittals so that work will not be delayed. Different categories of submittals shall be scheduled so that one will not be delayed for lack of coordination or approval of another. No extensions of time will be allowed because of failure to properly schedule or manage submittals.

1.2 SUMMARY

A. Related Sections:

1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.

2. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals or those inferred by the work shown on the drawings or detailed in the project documents.

B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

E. Time/Days: Where days are referenced as a measurement of time the unit shall be calendar days.

1.4 SUBMITTALS SCHEDULE

A. Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Format: Arrange the following information in a tabular format:
    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action, informational.
    d. Name of subcontractor, if applicable.
    e. Description of the Work covered.
    f. Scheduled date for Engineer's final release or approval.
    g. Scheduled dates for purchasing.
    h. Scheduled dates for installation.

i. Activity or event number from Construction Schedule.

B. Submit revised submittal schedule as necessary to reflect changes in current status and timing for submittals.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Engineer's Digital Data Files: Electronic copies of the Contract Drawings and project specifications may be provided by Engineer for Contractor's use in preparing submittals only if detailed in other Sections of the Contract Documents. In cases where Engineer provides electronic copies of these documents, Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to the Contract Drawings.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

C. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Based on the complexity of the submittal, allow 7 to 21 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Based on the complexity of the submittal, allow 7 to 21 days for review of each resubmittal.

4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.

E. Each submittal shall be accompanied by the transmittal cover contained in this section. The cover sheet shall be printed in a bright unique color of paper (color selected per project) and affixed to paper copies of each submittal. The information required for each submittal is contained on the cover sheet and shall be furnished for each submittal.

F. Submittal Identification Number: A unique four (4) character number shall be assigned by the Contractor and shall be noted on the transmittal cover sheet accompanying each submittal. Submittal numbers shall have the following format:

1. The first character shall be a SD, W, S, or M, which represents Shop Drawing Data (SD), Working Drawing (W), Sample (S), or Operating/Maintenance Manual (M).
2. The next digits shall be the specification section number.
3. The next digits shall be a three digit number (001 – 999) assigned to sequentially number each submittal.
4. The last character is a letter, A-Z, indicating the submission, or resubmission of the same data, i.e., A – 1st submittal, B- 2nd submittal, etc.
5. A typical submittal number would be:

SD-15800-013-A

where:

SD = shop drawing

15800 = technical specification section 15800

013 = contractor's submittal number 013

A = 1st submittal

G. Deviations: All deviations from the Contract Documents shall be identified on submittals.

H. Paper and Electronic Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

I. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Engineer will discard submittals received from sources other than Contractor.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.

2. Note date and content of revision and clearly indicate extent of revision.

3. Resubmit submittals until they are marked with approval notation from Engineer.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals that are marked with approval notation from Engineer.

PART 2 - PRODUCTS

2.1 <u>SUBMITTAL PROCEDURES</u>

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submittals: Submit one electronic copy in a PDF format of each submittal, unless otherwise indicated. Engineer will return one electronic copy via Dropbox.

2. All submittals shall include a copy of the specification section, with addendum updates included, and all referenced and applicable sections, and each paragraph shall be check-marked to indicate that the submitted material is in compliance with the specification or marked to indicate requested deviations from the specified requirements. If deviations are noted and/or requested each deviation shall be underlined and denoted by a number in the margin to the right with a detailed description of the deviation on a separate sheet.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. Mark each copy of each submittal to show which products and options are applicable.

2. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.

c. Standard color charts.
d. Statement of compliance or variations with specified referenced standards.
e. Testing by recognized testing agency.
f. Application of testing agency labels and seals.
g. Notation of coordination requirements.
h. Availability and delivery time information.

3. For equipment, include the following in addition to the above, as applicable:
   a. Wiring diagrams showing factory-installed wiring.
   b. Printed performance curves.
   c. Operational range diagrams.
   d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

4. Submit Product Data before or concurrent with Samples.

5. Submit Product Data in the following format:

   a. Submit one (1) electronic copy in a PDF format of each submittal, unless otherwise indicated. Engineer will return one (1) electronic copy via Dropbox.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance and variation with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 24 by 36 inches.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Identification: Attach label on unexposed side of Samples that includes the following:
    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of applicable Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit 2 full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return one (1) submittal with options selected.

E. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

F. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.

2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.

4. Submit subcontract list in the following format:

a. Submit two (2) paper copies and one electronic copy in a PDF format, unless otherwise indicated.

H. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

I. Equipment Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that the manufacturer has reviewed the Contract drawings and specifications, including all addendums, and that the equipment and related accessories included in the shop drawing submittal are suitable for installation in the applications proposed for the project. Include evidence of manufacturing experience where required.

J. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

C. Submittal Transmittal: Contractor shall include with each submittal a transmittal form as contained at the end of this section. Include all information required by the form including Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

A. Engineer will not review submittals that do not bear required cover sheet and ***Contractor's approval and signature*** and will return them without action.

B. Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. The transmittal form included in this section contains a copy of

the review stamp to be completed by the Engineer. The Engineer will complete the stamp for each submittal and will mark stamp appropriately to indicate action.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

F. Submittals will be returned to the Contractor under one of the following codes.

Code 1 – FURNISH AS SUBMITTED, No Exceptions – The review indicates that the material, equipment or work method complies with the project documents. In this event the contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.

Code 2 – FURNISH AS SUBMITTED, Make corrections noted – The review indicates that there are limited corrections required for the material, equipment or work method. In this event the contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal in accordance with the noted corrections.

Code 3 – NOT APPROVED (See Notes), Revise and resubmit – The review indicates that the submittal is insufficient or contains incorrect data, copies or other information. Except at his own risk, the Contractor shall not undertake work covered by this submittal until such time as it is revised and meets the requirements of code 1 or 2.

Code 4 – NOT APPROVED, Rejected – The review indicates that the submittal does not comply with the project documents and is unacceptable for incorporation into the project. Except at his own risk, the Contractor shall not undertake work covered by this submittal until such time as it is revised and meets the requirements of code 1 or 2.

Code 5 – Receipt Acknowledged – The review indicates that the material is for information purposes only and the Engineer has taken no action as none is required.

3.3 EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS

A. The Engineer's review of submittal information provided by the Contractor based upon his review of the drawings, specifications, other project documents and proposed methods of work or information regarding materials or equipment shall not relieve the Contractor of his responsibility for errors therein and shall not be regarded as an assumption of risks or liability by the Owner or the Engineer, or by any officer or

employee thereof, and the Contractor shall have no claim under the contract on the account of the failure, or partial failure, of the method of work, material, or equipment so reviewed. A mark of "No Exceptions" or "Make Corrections Noted" shall mean that the Owner has no objection to the Contractor, upon his own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

3.4 COSTS FOR REVIEW OF RESUBMITTALS

A. The Contractor shall be responsible for the completeness of each submittal and identifying deviations from the project requirements. Any submittal that may require more than two (2) reviews by the Engineer shall be assessed a review charge for time spent in processing shop drawings at the rate of the Engineer's current standard hourly fee schedule for personnel assigned to the shop drawing review and associated expenses. This charge, covering the cost of engineering and administration, shall be assessed against progress payments.

3.5 SUBMITTAL LOG

A. Prepare, maintain, and submit a tabular log of submittals organized by the submittal number. Contractor shall be prepared to discuss the log and the status of pending submittals at all Progress or Coordination Meetings.

3.6 CONTRACTOR'S APPROVAL COVER SHEET

A. To be printed on a bright unique color of paper selected for this project and used to designate a Shop Drawing or Informational Submittal and permanently attached or made a part of each submittal.

CONTRACTOR'S SUBMITTAL TRANSMITTAL

Submittal # _____

Engineer:	**ProE Engineering Services, LLC**	Owner:	**Roane County, Tennessee**
Address:	112 Newport Drive Oak Ridge, TN 37830	Address:	200 E. Race St. Suite 3 Kingston, TN 37763

Date:	Engineer's Project No: 20-17-02
Project: Paving – Roane County Park	Spec. Reference:
Contractor:	Drawing Reference:

TO: ProE Engineering Services, LLC

ATTN: Jake Greear
FROM:

CONTRACTOR'S SUBMITTAL NO:
(Check One):

☐ An Original Submittal

☐ A 2nd Submittal of *(original Submittal No.)*
☐ A _____ Submittal of *(original Submittal No.)*

☐ Product Data for Information Only
☐ An O&M Submittal for Information Only

Item #	Subject of Submittal / Equipment Supplier	Equipment Designations(s) / Specification Section(s):

Complete Either (a) or (b) below:

☐ (a) We have verified that the material, equipment or other information contained in this submittal meets all the requirements specified or shown (no exceptions).

☐ (b) We have verified that the material, equipment or other information contained in this submittal meets all the requirements specified or shown, except for the following deviations (list deviations):

Notes/Comments:

By this submittal, I hereby represent that I have determined and verified all field measurements and dimensions, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable shop drawings, equipment, trades and all Contract requirements.

_____ _____

Signature of Contractor's Authorized Representative *Date*

3.6 ENGINEER'S APPROVAL COVER SHEET

To be attached to each submittal.

SHOP DRAWING REVIEW

ENGINEER'S REVIEW	RESPONSE REQUIRED OF CONTRACTOR
☐ Furnish As Submitted, No Exceptions ☐ Furnish As Submitted, Make Corrections Noted ☐ Not Approved (See Notes), Revise and Resubmit ☐ Not Approved, Rejected, See Notes	☐ Confirm ☐ Resubmit
☐ Receipt Acknowledged (Not subject to Engineer's Review or Approval)	

The Engineer's review of this shop drawing is for general conformance with the design concept, contract documents, specifications and drawings. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications, nor departures there from, and does not relieve the Contractor from errors and omissions in the submittal or from the Contractor's responsibility of addressing any deviations from the contract documents, specifications and drawings. The Contractor remains solely responsible for details and accuracy, for confirming and correlating and verifying all quantities and dimensions at the jobsite, for selecting fabrication processes, for the means, methods, techniques, and sequence of construction, coordinating work with other trades, and performing all work in a safe manner. Engineer's approval shall not relieve Contractor of its obligation to perform construction in accordance with the Contract Documents. Any approval by Engineer shall not constitute an approved change or substitution unless Contractor has previously advised Engineer in writing of such proposed change or substitution and obtained Engineers written approval of such change or substitution.

ProE Engineering Services, LLC

By: _____

Date: _____

END OF SECTION 013300

SECTION 014000 QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality assurance and control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and control services required by Engineer, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:

1. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Product Testing: Tests and inspections that are performed by a Nationally Recognized Testing Laboratory (NRTL), an National Voluntary Laboratory Accreditation Program (NVLAP), or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

D. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

H. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainty and requirements that are different, but apparently equal, to Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.5 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

F. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Payment for these services will be made either directly by the Owner or from testing and inspecting allowances, as authorized by the Contract documents, if such allowances are include in the Contractor’s construction contract.

3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are the Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least 96 hours in advance of time when Work that requires testing or inspecting will be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, Contractor shall provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.

3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.

5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Contractor.

E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.

2. Incidental labor and facilities necessary to facilitate tests and inspections.

3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.

4. Facilities for storage and field curing of test samples.

5. Preliminary design mix proposed for use for material mixes that require control by testing agency.

6. Security and protection for samples and for testing and inspecting equipment at Project site.

F. Coordination: Coordinate sequence of activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that

are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution Requirements."

B. Protect construction exposed by or for quality control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality control services.

END OF SECTION 014000

SECTION 017000 EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. Installation of the Work.
   4. Cutting and patching.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.
   8. Correction of the Work.

B. Related Sections:

   1. Division 01 Section "Submittal Procedures".

   2. Division 01 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.

   3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 SUBMITTALS

A. Qualification Data: For professional land surveyor.

B. Certificates: Submit certificate signed by professional land surveyor certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit two copies signed by professional land surveyor.

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of all structures, underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and/or Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines,

services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately upon discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Engineer according to requirements in Division 01 Section "Project Management and Coordination." Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

B. General: Engage a professional land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines as needed to locate each element of Project.

2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.

3. Inform installers of lines and levels to which they must comply.

4. Check the location, level and plumb, of every major element as the Work progresses.

5. Notify Engineer when deviations from required lines and levels exceed allowable tolerances.

6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

3.4 FIELD ENGINEERING

A. Identification: Contractor shall identify existing or establish benchmarks, control points, and property corners as necessary.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Engineer before proceeding.

2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: Upon completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.

3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking, attachment plates, anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Engineer.

2. Allow for structure movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 degrees F.

3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Utilize containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.

2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Construction Waste Management".

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 ~~STARTING AND ADJUSTING~~

A. ~~Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements".~~

B. ~~Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.~~

C. ~~Adjust equipment for proper operation. Adjust operating components for proper operation without binding.~~

D. ~~Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.~~

E. ~~Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."~~

3.8 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017000

SECTION 01705 MOBILIZATION

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section consists of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the project site; for the establishment of all offices, building, and other facilities necessary for work on the project; and for all other work and operations that must be performed or costs incurred prior to beginning work on the various items on the project site. Included in this item will be the erection of all construction signs and signals, traffic warning devices, project sign, and other preparatory signs.

PART 2: NOT USED

PART 3: NOT USED

PART 4: MEASUREMENT AND PAYMENT

4.01 PAYMENT

A. Partial payments for the item of Mobilization will be made with the first and second partial pay estimates paid on the contract, and will be made at the rate of fifty percent (50%) of the lump sum price for Mobilization on each of these partial pay estimates. The amount for Mobilization in the approved schedule of values shall not exceed five percent (5%) of the total project bid.

END OF SECTION

SECTION 017700 CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final completion procedures.
   3. Warranties.
   4. Final cleaning.

B. Related Sections:

   1. Division 1 Section "Execution Requirements" for progress cleaning of Project site.

   2. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

   3. Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.

   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.

   2. Advise Owner of pending insurance changeover requirements.

   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

   4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Prepare and submit Project Record Documents, operation and maintenance manuals, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.

9. Submit test/adjust/balance records.

10. Terminate and remove temporary facilities from Project site, along with construction tools, and similar elements.

11. Advise Owner of changeover in heat and other utilities.

12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

13. Complete final cleaning requirements, including touchup painting.

14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. Upon receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for final completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."

2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.

D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.

e. As necessary, remove snow and ice to provide safe access to the work area.

f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

h. Sweep floors broom clean.

i. Vacuum any carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.

j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

k. Remove labels that are not permanent.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

o. Clean any and all plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

p. Replace any and all disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

r. Leave Project clean and ready for operation.

B. Construction Waste Disposal: Comply with waste disposal requirements in the General Conditions of this contract.

END OF SECTION 017700

(Standard Form Attached)

CONTRACTOR'S FINAL AFFIDAVIT AND WAIVER OF LIEN

PROJECT: _____ OWNER: _____

_____ _____

_____ _____

CONTRACTOR: _____

_____

_____

CONTRACT AMOUNT:_____

STATE OF: _____ CONTRACT DATE: _____

COUNTY OF: _____ DATE: _____

This is to certify that all claims for labor, material, services and any other just claims arising out of the performance of this Contract have been satisfied, except for payment to subcontractors to be made out of retainage presently being held by the Owner, and that no claims or liens exist against this Contractor in connection with this contract; that to the best of our knowledge no claims or liens exist, and if any such claims or liens appear after payment of the retained amount due on the Contract, this Contractor shall save the Owner harmless on account thereof. After payment of the retained amount the undersigned does hereby waive, release and relinquish any and all claims or rights of lien presently held or hereafter accruing upon the above project.

CONTRACTOR: _____

BY: _____

TITLE: _____

Sworn to and subscribed before me this _____ day of 20 ____

_____

(Notary Public)

My Commission expires: _____

SECTION 017839 PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.

2. Miscellaneous record submittals.

B. Related Sections:

1. Division 01 Section "Closeout Procedures" for general closeout procedures.

2. Divisions 2 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up record prints and one digital copy as described below.

B. Miscellaneous Record Submittals: Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy and one digital copy of each submittal as described below.

1.4 PRODUCTS

1.5 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

    b. Accurately record information in an understandable drawing technique.

    c. Record data as soon as possible after obtaining it.

    d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.

    b. Revisions to details shown on Drawings.

    c. Depths of foundations below grade.

    d. Locations and depths of underground utilities.

    e. Revisions to routing of piping and conduits.

    f. Revisions to electrical circuitry.

    g. Actual equipment locations.

    h. Changes made by Change Order or Work Change Directive.

    i. Changes made following Engineer's written orders.

    j. Details not on the original Contract Drawings.

    k. Field records for variable and concealed conditions.

    l. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Change Order or Work Change Directive numbers, alternate numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Engineer. When authorized, prepare a digital copy of those Contract Drawings.

C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Provide information in the following formats:

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

2. Record Digital Data Files on a disk: Organize digital data information into separate PDF electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.

3. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Contractor.

1.6 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit three (3) paper copies and two (2) digital copies of all miscellaneous records.

1. Include a miscellaneous record submittals directory organized by specification section number and title, electronically linked to each item of miscellaneous record submittals.

PART 2 - EXECUTION

2.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

END OF SECTION 017839

SECTION 02050 DEMOLITION

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work of this Section consists of removal and disposal of structures, old pavements, abandoned pipelines, and other obstructions as designated, including salvaging of materials and backfilling of resulting trenches, holes, and pits. Also included is all work that relates to explosives, including receiving, handling, transporting, storing, distributing, priming, loading, firing, and disposal.

B. Raze, remove, and dispose of structures, and other obstructions indicated. Carefully remove designated salvageable material, and transport and store in approved locations. Fill cavities left by structure removal to the level of the surrounding ground and thoroughly compact, as directed. Directions for execution of the work will be supplemented by the Engineer as necessary.

PART 2: NOT USED

PART 3: EXECUTION

3.01 DEMOLITION

A. Bituminous Paved Areas: Scarify and completely remove. Resultant material may be utilized in bottom portion of areas to receive fill. No pieces shall be left exposed in the fill slopes. If material is used in any portion of the new construction, layers shall be a maximum of eight inches (8") and separated by a minimum six inch (6") layer of earth. Water and compaction requirements are specified under other Sections. No compaction is required for materials used for obliteration work outside the limits of new construction.

B. Removal of Concrete Surfaces and Structures: Break concrete designated for removal into pieces and use for rip-rap. The volume, minimum of such pieces shall be 0.5 cubic foot; seventy-five percent (75%) of pieces shall be between 1.5 and 2.0 cubic feet. Stockpile at designated locations.

C. Pipe Removal: Remove pipe, exercising care to avoid breaking or damaging. Store pipe to be re-laid as directed.

3.02 EXPLOSIVES

A. General: The Contractor shall notify the Engineer or his representative prior to using any explosives. The Contractor shall be solely liable for any and all damage caused directly or indirectly by the use of explosives.

B. Legal Requirements: Comply with all applicable Federal, State, and Local laws and regulations pertaining to the use, storage, and handling of explosives. It is the intent of these Specifications to comply with such laws and regulations. In the event of inconsistencies between these Specifications and the laws and regulations, the laws and regulations take precedence, subject to final determination by the Engineer.

C. Protection: The Contractor shall exercise the utmost care not to endanger life and property. Make proper use of blasting mats and other protective devices, adopting whatever additional precautions are deemed necessary to prevent damage to trees, shrubs, other landscape features, buildings, utilities, monuments, and other structures. Make every effort to prevent damage to the natural and the constructed surroundings. Should damage occur, make restoration as required by the Engineer.

D. Personnel: One competent, experienced person shall be specifically designated in charge of explosives. The designated person must present certification to the Engineer that he has successfully completed a course in the handling and use of explosives, given by an accredited institution such as the U.S. Bureau of Mines, DuPont, or other explosive manufacturing company. He shall exercise careful supervision of all work related to the use, storage, and handling of explosives. Permit only a minimum number of competent, experienced men, consistent with efficient operation, to handle explosives. Exclude anyone demonstrating carelessness, incompetence, or inexperience from further handling of explosives.

E. Requirements: The Contractor shall give special attention to the following specific rules:

    1. Locate magazines in accordance with the American Table of Distances for Storage of Explosives and only at sites approved by the Engineer.

    2. Magazines shall be bulletproof, fireproof, burglarproof, weather resistant and constructed with adequate screened ventilation and dry wood floors. Countersink all nails exposed to the interior of magazines.

    3. Do not store detonators with other explosives but in separate magazines.

    4. Magazines shall not be provided with artificial heat or lights.

    5. Securely lock magazines.

    6. Mark magazines and roads in area with appropriate caution and danger signs.

    7. Clear blast area of unnecessary personnel and equipment before delivery of any explosives to the site.

    8. Keep no more than a one (1)-day supply of explosives at or near the work site. Keep explosives in approved portable magazines in locations approved by the Engineer.

9. Use only wooden tamping bars for charging explosives into drill holes.

10. Do not use electricity from light or power circuits for firing shots, unless the electrical connection to the circuit is made within an enclosed switch box securely locked with switch in open position.

11. Provide a positive warning system to give adequate warning in every direction immediately prior to firing explosives. Guard all access points to the blast area to halt personnel and vehicles a safe distance from the blast. Maintain intercommunication between guards and person firing the blast assuring the blast area is clear prior to firing.

12. Provide special signs or signals at all access points, including a warning to turn off radio transmitters whenever electrical detonators are used.

3.03 DISPOSAL

A. Dispose of debris from demolition operations in an approved and satisfactory manner.

PART 4: MEASUREMENT AND PAYMENT

4.01 PAYMENT

A. Payment for work in this Section should be on a unit price basis and included in "Walking Trail Repair".

END OF SECTION

SECTION 02200 EARTHWORK

PART 1: GENERAL

1.01 SCOPE OF WORK

The work included in this Section consists of the grading of the project area. The work includes:

A. Site clearing and off-site disposal of all debris and unsuitable material.

B. Removal of all topsoil, organically contaminated soil, and existing unsuitable fill.

C. Proof rolling and grading of the property to the prescribed elevations.

D. Stockpiling or wasting on-site of any excess cut material for providing acceptable material as required to obtain the desired grades.

1.02 SITE CONDITIONS

No subsurface test results are available for this project. Test borings and other exploratory operations may be undertaken by the Contractor at his own expense, provided that such operations are acceptable to the Owner.

PART 2: PRODUCTS

2.01 MATERIALS

A. UNSTABLE MATERIAL

1. Organically contaminated soils must be removed from the area of grading operations. At the discretion of the Engineer, topsoil within the area to be stripped shall be stockpiled in a convenient area, selected by the Engineer, for later use in planting area. All topsoil shall be graded by the Engineer as suitable and shall be stockpiled separately as directed by the Engineer in the field.

2. Soft or excessively yielding material shall be removed and replaced with inert controlled fill.

B. FILL MATERIAL

1. Material to be used for fill shall be approved by the Engineer.

2. All roots, organic matter, trash, debris, and other unsuitable materials that may find their way into otherwise acceptable fill material shall be removed during the dumping and spreading operations.

3. Broken rock and boulders larger than six inches (6") in any dimension may not be used as fill without the specific approval of the Engineer.

4. Frozen soil shall not be used for fill.

5. Fill material shall have a maximum laboratory dry weight, ASTM D-698, of at least one hundred (100) pounds per cubic foot, unless specifically exempted from this requirement.

PART 3: EXECUTION

3.01 PREPARATION

A. SURFACE PREPARATION

1. After removal of all existing topsoil, debris, and other undesirable material, the areas that are to receive fill, that have been cut to the desired grade, or that are at the approximate required subgrade elevation without additional earthwork, should be proof rolled to locate any soft or yielding area. Proof rolling shall be done with at least (4) four overlapping passes of a heavy-duty flat wheel vibratory roller, at least twenty (20) tons, or by its approved equivalent.

2. Any soft or excessively yielding material revealed by the proofrolling shall be removed and replaced with inert controlled fill. The Engineer shall be the sole judge of what constitutes soft or excessively yielding material.

3. Drainage from existing watercourses, springs, or other sources should be rerouted out of the earthwork area. The Contractor shall take special care to remove all organically contaminated sediment, saturated soil, and other undesirable material from existing watercourses.

B. BLASTING AND DAMAGES

Where blasting is done, it shall be done by qualified personnel and in accordance with all Federal, State, or Local requirements and procedures. The Contractor shall be responsible for any damage done to adjoining properties or to persons by reason of the blasting or

other earthwork operations. The Contractor shall also be responsible for damage To embankments and cut areas and sewer, water, gas, or other underground lines that may result from blasting or earthwork operations. All such damage shall be repaired and made good by the Contractor in a timely manner.

3.02 INSTALLATION

A. FILLING AND COMPACTION

1. After a stable non-yielding surface has been established, the surface of the area to be filled shall be scarified with a disc or harrow to a depth of four to six inches (4-6″).

2. An initial three-inch (3″) layer of fill material shall then be spread over the scarified surface and the entire area compacted as specified below.

3. No fill shall be placed on any area until that area has been inspected and approved by the Engineer.

4. Fill shall not be placed on a snow-covered or frozen surface.

5. Fill materials shall be spread in uniform horizontal layers not exceeding eight inches (8″) in uncompacted thickness. Alternating layers of cohesive and granular fill soils shall not be permitted. All fill must be placed in horizontal layers.

6. Spreading and compacting of fill material should be started at the lowest portion of the site.

7. Sloping fill planes will not be permitted.

8. Fill material shall be distributed over the full width of the embankment, and in no case will deep ruts be allowed to form.

9. Keyways shall be provided at the toe of each fill slope as shown on the Drawings.

    a. As each layer of fill meets the natural grade of a slope, a bench, approximately seven to eight feet (7-8′) wide, shall be cut into the existing grade with each layer of newly placed fill.

b. If rock is encountered at the face of the natural grade, the original ground shall be cut in vertical steps of four to five feet (4-5') and a horizontal bench cut into the rock at the top of each vertical increment.

c. A horizontal plateau, approximately fifteen to twenty feet (15-20') wide, should be provided in the existing slope at vertical intervals of roughly twenty-five feet (25').

10. Subsurface drains shall be installed at the toe of the slope and wherever springs or excessive seepage are encountered. Drains should be led to the outside face of the embankment and the water picked up and carried away in such a manner as to avoid softening the embankment or its toe, or producing erosion gullies.

11. Before compaction begins, the fill shall be brought to a water content that will permit proper compaction. This may require aerating the material if it is too wet, or the addition of water if it is too dry. If additional water is required, it should be uniformly distributed through the use of approved water wagons, and shall be thoroughly incorporated into the material by means of discs or other suitable mixing equipment. Care shall be taken to avoid trapping water within the fill.

12. The standard Proctor method of moisture-density relationship test, ASTM D 698 or AASHTO T-99, shall be used to determine the maximum laboratory dry density and the optimum moisture content of the material that is to be used for fill.

13. Each layer of fill material shall be compacted until its density is not less than ninety-five percent (95%) of the maximum laboratory dry density for the same material. The moisture content of compacted cohesive materials shall not vary by more than two (2) percentage points from the optimum moisture content for the same material, providing excessive yielding is not produced within this range of moisture contents. Where, in the opinion of the Engineer, proposed fill material is too wet to permit drying in a reasonable length of time, the Engineer may reject the material, and it must be removed from the work area.

14. The above compaction requirements are to be satisfied for all soil and weathered or soft rock fills. Weathered or soft rocks are those that can be broken down and disintegrated under normal compaction procedures and equipment.

15. At the close of each day's work, or where work is to be interrupted for a period of time, the surface of the site shall be shaped to drain freely and sealed. If after a prolonged rainfall, the surface of the area to be filled or cut is too wet to work properly, the unsuitable material shall be removed to expose workable soil. The

wet material removed may be dried and reused. Construction traffic shall be controlled so as to prevent rutting of graded areas and to avoid overrolling of any section.

16. All cut areas shall be rolled and compacted to produce a compaction equal to that of the filled area. If soft or yielding material is encountered in cuts or fills as a result of trapping water, overrolling, or improper control of construction traffic, and said material cannot be satisfactorily stabilized by moisture control, compaction, or other means approved by the Engineer, the unstable material shall be excavated to the depth required by the Engineer. The excavation shall then be filled with suitable compacted material in accordance with the requirements outlined above.

B. GRADING

1. Elevations shown on the Plans are finished ground, unless otherwise noted. Grading shall be maintained in such a manner as to provide free surface drainage of the site at all times without any ponding of water.

2. Provide ditches and swales to the cross-sections and grades shown on the Drawings. Cut ditch subgrades four inches (4″) below the grades shown and provide four inches (4″) of topsoil where the Plans call for seeding or sodding of the ditch. Keep ditches and swales free of accumulations of debris or washed in material until final acceptance of work by the Engineer.

3. Shape all surfaces to within not more than 0.10 feet above or below the required subgrade elevations and make free from irregular surface changes.

C. MAINTENANCE

1. The Contractor shall be responsible during construction and until final acceptance for the maintenance of all embankments made under the Contract.

2. During construction and until final acceptance, the Contractor shall construct temporary or permanent earth berms along the outer edges of the top surface of the embankment, construct temporary ditches, shape the embankment surface to provide for the drainage of surface runoff along and throughout the length of the embankments, and use any other methods necessary to maintain the work covered by this Section so that the work will not contribute to excessive soil erosion. The Contractor shall construct brush dikes or install temporary or permanent slope drains or other drainage features to assist in controlling erosion.

3. The Contractor shall replace, at no cost to the Owner, any portion of embankment that has become displaced or damaged due to carelessness or neglect on the part of the Contractor. Where the work has been properly constructed, completely drained, and properly maintained, and damage occurs due to natural causes, the Contractor will be paid at the Contract unit price for the excavated material required to make necessary repairs to such damage.

4. All embankments shall be brought to the grade and cross-section shown on the Plans or established by the Engineer prior to final inspection and acceptance by the Engineer.

3.03 FIELD QUALITY CONTROL

QUALITY CONTROL AND TESTING

A. The services of qualified soils-testing personnel may be engaged by the Owner for the making of tests to determine the moisture-density relationships, relative densities, plastic and liquid limits, and suitability of materials for compaction and for inspection and control of the site preparation, selection, placing, and compaction of the fill. Such tests will be provided and paid for by the Owner, except those tests that reveal nonconformance with the Specifications and all succeeding tests for the same area, until conformance with the Specifications is established, shall be at the expense of the Contractor. The Owner will be responsible for paying for only the successful tests. A copy of the testing personnel's daily field report including results of in-place density and moisture content tests should be forwarded to the Owner and the Engineer at the end of each working day.

B. The Contractor shall cooperate with the testing personnel so as to permit proper inspection and control of the work without unnecessary delays.

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

Clearing and grubbing shall consist of the removal and satisfactory disposal of all trees, brush, stumps, logs, grass, weeds, roots, decayed vegetable matter, posts, fences, stubs, rubbish, and all other objectionable matter resting on or protruding through the original ground surface and occurring within the construction limits or right-of-way of any excavation, borrow area, or embankment.

PART 2: NOT USED

PART 3: EXECUTION

3.01 GENERAL

A. Clearing and grubbing operations shall be completed sufficiently in advance of grading operations as may be necessary to prevent any of the debris from the clearing and grubbing operations from interfering with the excavation or embankment operations. All work under this Section shall be performed in a manner that will cause minimum soil erosion. The Contractor shall perform such erosion control work, temporary or permanent, as may be directed by the Engineer in order to satisfactorily minimize erosion resulting from clearing and grubbing operations.

B. CLEARING

1. The work of clearing shall be performed within the limits established by the Plans, Specifications, or the Engineer.

2. Clearing shall consist of the felling and cutting up or the trimming of trees and the satisfactory disposal of the trees and other vegetation, together with the downed timber, snags, brush, and rubbish occurring within the areas to be cleared. Trees and other vegetation, except such individual trees, groups of trees, and vegetation, as may be indicated on the Plans to be left standing, and all stumps, roots, and brush in the areas to be cleared shall be cut off six inches (6") above the original ground surface.

3. Individual trees and groups of trees designated to be left standing within cleared areas shall be trimmed of all branches to such heights and in such manner as may be necessary to prevent interference with construction operations. All limbs and branches required to be trimmed shall be neatly cut close to the trunk of the tree or to main branches, and the cuts thus made shall be painted with an approved tree wound paint. Individual trees, groups of trees, and other vegetation to be left standing shall be thoroughly protected from damage incident to construction operations by the erection of barriers or by such other means as the circumstances require.

4. The Engineer will designate all areas of growth or individual trees that are to be preserved due to their desirability for landscape or erosion control purposes. When the trees to be preserved are located within the construction limits, they will be shown on the Plans or designated by the Engineer.

5. Clearing operations shall be conducted so as to prevent damage by falling trees to trees left standing, to existing structures and installations, and to those under construction, and so as to provide for the safety of employees and others. When such damages occur, all damaged areas shall be repaired, removed, or otherwise resolved utilizing generally accepted practices at the Contractor's expense.

C. GRUBBING

1. Grubbing shall consist of the removal and disposal of all stumps, roots, and matted roots from all cleared areas, except as herein specified.

2. In embankment areas, when the depth of embankment exceeds three feet, six inches (3'-6") in height, sound stumps shall be cut off not more than six inches (6") above the existing ground level and not grubbed. Unsound or decayed stumps shall be removed to a depth of approximately two feet (2') below the natural ground surface.

3. All depressions excavated below the natural ground surface for or by the removal of stumps and roots shall be refilled with suitable material and compacted to make the surface conform to the surrounding ground surface.

4. Disposal of Cleared and Grubbed Material

Saw logs, pulp wood, cord wood, or other merchantable timber removed incidental to clearing and grubbing shall remain the property of the Owner. All combustible matter shall be deposited at locations approved by the Engineer. Combustible matter may be burned or may be disposed of as stated above. Debris shall not be burned unless written permission or permit is issued by the Fire Marshal having jurisdiction in the area, if applicable. The Contractor shall adhere to all limitations and conditions set forth in the permit. Burning shall be done at such time and such manner as to prevent fire from spreading and to prevent any damage to adjacent cover and shall further be subject to all requirements of State or Federal Governments pertaining to the burning. Disposal by burning shall be kept under constant attendance until all fires have burned out or have been extinguished.

PART 4: MEASUREMENT AND PAYMENT

4.01 PAYMENT

Payment for Clearing and Grubbing work specified in this section shall be made as a Lump Sum under "Site Work."

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

The work of this Section consists of furnishing, loading, hauling, and placing of borrow material in the construction of embankments or the work of other Sections as shown and specified.

PART 2: PRODUCTS

2.01 MATERIALS

A. GENERAL

1. Borrow material shall be selected to meet the requirements and conditions of the particular fill for which its use is intended.

2. Sand-clay soils shall be capable of being readily shaped and compacted to the required densities, and shall be free of roots, trash, and other deleterious material.

3. Unless specifically provided, no borrow shall be obtained within the limits of the project site without written approval.

4. Borrow shall consist of material obtained from sources provided by the Contractor and shall meet the requirements of the classifications in accordance with USCS listed below:

    a. Acceptable Classifications: GW, GP, GM, SW, SP, SC, SM, ML, and CL.

    b. Unacceptable Classifications: PT, OH, OL, CH, and MH.

B. COHESIONLESS MATERIALS

Cohesionless materials include poorly- and well-graded gravels (GP and GW) and poorly and well-graded sands (SP and SW). Cohesionless soils are generally regarded as free-draining.

C. COHESIVE MATERIALS

Clayey gravels (GC), clayey sands (SC), lean clays (CL), fat clays (CH), silts (ML and MH), and organic (GM) and silty sands (SM) will be considered cohesionless only when the fines have a plastic index of 0. Otherwise they will be considered cohesive.

PART 3: EXECUTION

3.01 INSTALLATION

The Contractor shall place only borrow material that has been specifically identified as acceptable for this Section, unless otherwise directed by the Engineer.

PART 4: MEASUREMENT AND PAYMENT

4.01 COMPENSATION

No direct payment will be made for the work covered by this Section. Payment at the Contract prices for the various items in the Contract will be full compensation for all work covered by this Section, including, but not limited to, furnishing any borrow areas; any right of access to borrow areas; and dressing and shaping of fill areas.

END OF SECTION

SECTION 02213 WASTE MATERIAL DISPOSAL

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section consists of the disposal of waste and debris in accordance with the requirements of these Specifications. Waste will be considered to be all excavated, grubbed, or removed materials that are not utilized in the construction of the project.

PART 2: NOT USED

PART 3: EXECUTION

3.01 GENERAL REQUIREMENTS

A. Waste shall be disposed of in areas that are outside of the project area and provided by the Contractor, unless otherwise required by the Plans or Special Provisions or unless disposal within the project area is permitted by the Engineer.

B. The Contractor shall maintain the earth surfaces of all waste areas, both during the work and until the completion of all seeding and mulching or other erosion control measures specified, in a manner that will effectively control erosion and siltation.

C. The following requirements shall also be applicable to all waste or disposal areas other than active public waste or disposal areas:

1. Rock Waste: Rock waste shall be shaped to contours that are comparable to and blend in with the adjacent topography where practical and shall be covered with a minimum six-inch (6") thick layer of earth material either from the project waste or from borrow.

2. Earth Waste: Earth waste shall be shaped to contours that are comparable to and blend in with the adjacent topography where practicable, but in no case will slopes steeper than 2:1 be permitted.

3. Construction Debris, Grubbed Debris, Broken Pavement and Masonry: Construction debris, grubbed debris, and all broken pavement and masonry shall be covered with a minimum six-inch (6") thick layer of earth waste material from the project or borrow. The completed waste area shall be shaped as required above for disposal of earth waste.

4. Seeding and Mulching: Seeding and mulching shall be performed over all earth or earth-covered waste areas. The work of seeding and mulching shall be performed in accordance with Section 02931.

5. Where the Engineer has granted permission to dispose of waste and debris within the project, the Engineer will have the authority to establish whatever additional requirements may be necessary to ensure the satisfactory appearance of the completed project.

6. Disposal of waste or debris in active public waste or disposal areas will not be permitted without prior approval by the Engineer. Such disposal will not be permitted when, in the opinion of the Engineer, it will result in excessive siltation or pollution.

PART 4: MEASUREMENT AND PAYMENT

4.01 PAYMENT

A. No direct payment will be made for the work covered by this Section. Payment at the Contract prices for the various items in the Contract will be full compensation for all work covered by this section, including, but not limited to, furnishing any waste areas; any right of access to waste areas; disposing of waste and debris; dressing and shaping of waste areas; furnishing and spreading earth material over debris, rock, broken pavement, and masonry; clearing and grubbing of waste areas; and hauling waste and debris to waste areas.

END OF SECTION

SECTION 02230 MINERAL AGGREGATE BASE

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section consists of the construction of a stone base or stone backfill composed of an approved mineral aggregate base material hauled to the site, placed, compacted, and shaped to conform to the lines, grades, depths, and typical sections shown on the Plans or established by the Engineer.

PART 2: PRODUCTS

2.01 MATERIALS

A. Mineral aggregate base materials shall consist of crushed stone, uncrushed gravel, or other similar material having hard, strong, durable particles free of adherent coatings.

B. The Contractor shall furnish mineral aggregate base material produced in accordance with the requirements indicated herein for Class A aggregate unless otherwise specified in the special provisions.

C. All aggregates shall be from approved sources. Sources will not be approved unless the material has satisfactory soundness and satisfactory resistance to abrasion. Satisfactory soundness will be considered to be a weighted average loss of not greater than fifteen percent (15%) when subjected to five (5) alternations of the sodium sulfate soundness test in accordance with AASHTO T104. Satisfactory resistance to abrasion will be considered to be a percentage of wear of not greater than fifty percent (50%) when tested in accordance with AASHTO T96.

D. Aggregates shall be handled in such a manner as to minimize segregation.

E. Sites for aggregate stockpiles shall be grubbed and cleaned prior to storing aggregates, and the ground surface shall be firm, smooth, and well-drained. A cover of at least three inches (3") of aggregate shall be maintained over the ground surface in order to avoid the inclusion of soil or foreign material. Stockpiles shall be built in such a manner as to minimize segregation. When it is necessary to operate trucks or other equipment on a stockpile in the process of building the stockpile, it shall be done in a manner approved by the Engineer.

F. Stockpiles of different types or sizes of aggregates shall be spaced far enough apart, or else separated by suitable walls or partitions, to prevent the mixing of the aggregates.

G. Any method of stockpiling aggregates that allows the stockpile to become contaminated with foreign matter or causes excessive degradation of the aggregate will not be

permitted. Excessive degradation will be determined by sieve tests of samples taken from any portion of the stockpile over which equipment has been operated, and failure of such samples to meet all grading requirements for the aggregate will be considered cause for discontinuance of such stockpiling procedure.

H. Gradation: All standard sizes of aggregates shall meet the gradation requirements of Tennessee Department of Transportation, Standard Specifications Section 903.05 for Class A aggregate, Grading D.

PART 3: EXECUTION

3.01 CONSTRUCTION OF STONE BASE

A. The aggregate material shall be spread on the subgrade to a uniform loose depth and without segregation.

B. Where the required compacted thickness of base is eight inches (8") or less, the base material may be spread and compacted in one (1) layer, providing compaction requirements are achieved. Where the required compacted thickness of base is more than eight inches (8"), the base material shall be spread and compacted in two (2) or more approximately equal layers. The minimum compacted thickness of any one (1) layer shall be approximately four inches (4").

C. Each layer of material shall have been sampled, tested, compacted, and approved prior to placing succeeding layers of base material or pavement. Such tests will be provided and paid for by the Owner, except those tests that reveal non-conformance with the Specifications and all succeeding tests for the same area shall be at the expense of the Contractor until conformance with the Specifications is established. The Owner will be responsible for paying for only the successful tests. The minimum compaction for each layer shall be one hundred percent (100%) standard proctor.

D. No base material shall be placed on frozen subgrade or base. Hauling equipment shall not be operated on subgrade or a previously completed layer of base material soft enough to rut or weave beneath the equipment.

E. The maximum speed of trucks hauling or traveling over any part of the subgrade or base shall be five (5) miles per hour.

F. The Contractor shall utilize methods of handling, hauling, and placing that will minimize segregation and contamination. If segregation occurs, the Engineer may require that changes be made in the Contractor's methods to minimize segregation, and may also require mixing on the road in order to correct any segregated material. No additional compensation will be allowed for the work of road mixing as may be required under this provision. Aggregate that is contaminated with foreign materials to the extent that the base course will not adequately serve its intended use shall be removed and replaced by

the Contractor at no additional cost to the Owner. The above requirements will be applicable regardless of the type of aggregate placed and regardless of prior acceptance.

3.02 CONSTRUCTION OF STONE BACKFILL

A. The backfill stone shall be spread to uniform depth without segregation.

B. Where the required compacted thickness of base is eight inches (8") or less, the base material may be spread and compacted in one (1) layer, providing compaction requirements are achieved. Where the required compacted thickness of base is more than eight inches (8"), the base material shall be spread and compacted in six inch (6") lifts.

3.03 QUALITY CONTROL

A. Tolerances:

1. After final shaping and compacting the base, the Engineer will check the surface of the base for conformance to grade and typical section and will determine the base thickness.

2. The thickness of the base shall be within a tolerance of plus or minus one-half inch (±1/2") of the base thickness required by the Plans.

B. Maintenance: Where the base material is placed in a trench section, the Contractor shall provide adequate drainage through the shoulders to protect the subgrade and base until such time as shoulders are completed. The Contractor shall maintain the surface of the base by watering, machining, and rolling or dragging when necessary to prevent damage to the base by weather or traffic.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Base Stone: The quantity of Mineral Aggregate Base to be paid for will be the actual amount of mineral aggregate base, which has been incorporated into the completed and accepted work. Measurement will be based on the units provided for in the bid schedule.

B. Backfill Stone: The quantity of Backfill Stone to be paid for will be the actual amount of backfill stone, which has been incorporated into the completed and accepted work. Measurement will be based on the units provided for in the bid schedule.

4.02 PAYMENT

A. Base Stone: The quantity of Mineral Aggregate Base installed and accepted will be paid for as part of the unit price provided for in the Bid Schedule for "Walking Trail Repair". In

all cases, regardless of the unit of measure, the Contractor shall furnish copies of certified weight tickets for all material placed on the project.

B. Backfill Stone: The quantity of Backfill Stone installed and accepted will be paid for will at the unit price provided for in the bid schedule as measured in subsection 4.01 B above. Backfill stone listed as a part of additional unit price or lump sum bid items in the Bid Schedule will not be paid for at unit prices. In all cases, regardless of the unit of measure, the Contractor shall furnish copies of certified weight tickets for all material placed on the project.

END OF SECTION

SECTION 02241 SUBGRADE

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section consists of the preparation, shaping, and compaction of that portion of the roadbed upon which base or pavement, including base and paving for shoulders, is to be placed.

PART 2: NOT USED

PART 3: EXECUTION

3.01 CONSTRUCTION

A. The subgrade shall be shaped to the lines, grades, and typical sections shown on the Plans.

B. All unsuitable material, boulders, and all vegetative matter shall be removed and replaced with suitable material. Suitable material, when not available from the subgrade work, shall be taken from roadway excavation or borrow pits.

C. Material excavated in preparing the subgrade shall be stored or stockpiled in such a manner as to not interfere with proper drainage or any of the subsequent operations of placing base or pavement.

D. The subgrade shall be compacted at a moisture content that is approximately that required to produce the maximum density. The Contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.

3.02 QUALITY CONTROL

A. A tolerance of plus or minus one-half inch (±1/2″) from the established grade will be permitted after the subgrade has been graded to a uniform surface.

B. Ditches and drains shall be provided and maintained when required to satisfactorily drain the subgrade. Where previously approved subgrade is damaged by natural causes, by hauling equipment, or by other traffic, the Contractor shall restore the subgrade to the required lines, grades, and typical sections and to the required density at no cost to the Owner.

PART 4: MEASUREMENT / PAYMENT

4.01 PAYMENT

A. No separate payment will be made for work performed under this Section. Compensation therefore will be considered as included in the unit prices shown in the bid for the various items to which Subgrade Construction is an incidental element.

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

The work covered by this Section consists of the construction of plain rip rap in accordance with the requirements of the Plans and these Specifications and at the locations designated by the Engineer.

PART 2: PRODUCTS

2.01 DEFINITIONS

A. PLAIN RIP RAP

Plain rip rap shall consist of quarry run stone, or field stone or granite stone, etc., and shall be classified by size into Class 1 or Class 2. The class and thickness to be used will be called for on the Plans.

B. CLASS 1 RIP RAP

1. Stone shall vary in weight from five to two hundred (5-200) pounds.

2. At least thirty percent (30%) of the total weight of the rip rap shall be in individual pieces weighing a minimum of sixty (60) pounds each.

3. Not more than ten percent (10%) of the total weight of the rip rap may be in individual pieces weighing less than fifteen (15) pounds each.

C. CLASS 2 RIP RAP

1. Stone shall vary in weight from twenty-five to two hundred fifty (25- 250) pounds.

2. At least sixty percent (60%) of the total weight shall be in individual pieces weighing a minimum of one hundred (100) pounds each and not more than one hundred (100) pounds each.

3. Not more than five percent (5%) of the total weight may be individual pieces weighing less than fifty (50) pounds each.

PART 3: EXECUTION

3.01 PLACEMENT OF RIP RAP

A. Unless otherwise indicated or directed by the Engineer, the stone shall be placed upon a slope that shall be no steeper than the angle of repose.

B. The stone shall be graded so that the smaller stones are uniformly distributed throughout the mass.

C. The area and thickness shall be as shown on the Plans or as designated by the Engineer.

D. The Contractor may place the stone by mechanical methods, augmented by hand placing where necessary, provided that when the rip rap is completed it forms a properly graded, dense, neat layer of stone.

PART 4: MEASUREMENT AND PAYMENT

4.01 PAYMENT

Payment shall be for stone delivered, placed, and properly tied to the existing facilities as shown on the Plans. Payment shall be based on the field measurement per square yard at twenty-four-inch (24") minimum thickness.

END OF SECTION

SECTION 02510 BITUMINOUS PAVING

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work covered by this Section shall consist of the construction, production, delivery, and placement of bituminous plant mix base and surface courses properly laid on a prepared mineral aggregate base, in accordance with these Specifications and in conformity with the lines, grades, thickness, and typical sections shown on the Plans.

1.02 SUBMITTALS

A. When required by the Engineer, the Contractor shall furnish a job mix formula for the type of mixture specified for approval by the Engineer. Requirements shall conform to the Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction (TDOT Standard Specifications).

1.03 QUALITY ASSURANCE

A. When required by the Engineer, the automatic weighing and recording system shall be checked by weighing a truckload of mix with an approved set of platform scales. The Engineer will designate other means of checking the automatic weighing and recording system if such checking becomes necessary.

B. The Contractor will not be permitted to use mixture delivered to the site that is not accompanied by a load ticket signed by the weighman or an automatic printout ticket in accordance with the above requirements.

C. The original of all tickets, including any voided tickets or tickets for rejected mixture, shall become the property of the Engineer.

D. Bituminous Plant Mix Pavements (General): Pavement materials, hauling, equipment, production, placement, and weather limitations shall comply with Section 407 of the TDOT Standard Specifications, unless otherwise stated.

PART 2: PRODUCTS

2.01 MATERIALS

A. Composition of Mixtures – General:

1. The bituminous plant mix shall be composed of a mixture of aggregate, asphalt cement, and mineral filler when required.

2. The aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of a job mix formula prepared by the Engineer. Materials that will not produce a job mix within the full allowable tolerances required by these Specifications will be rejected.

3. The job mix formula with the allowable tolerances shall be within the design limits specified for the particular type of bituminous mixture.

4. The job mix formula for each mixture will establish a single percentage of aggregate passing each required sieve size, a single percentage of asphalt cement to be added to the aggregate, and a single temperature at which the mixture is to be discharged from the plant.

5. The job mix formula for each mixture shall be in effect until modified in writing by the Engineer.

6. All mixtures furnished for the work shall conform to the job mix formula within the tolerance ranges specified for the particular mix involved as specified herein.

7. Should a change in sources of aggregate materials be made, a new job mix formula will be required before the new mixture is produced.

8. When unsatisfactory results or other conditions make it necessary, the Engineer may establish a new job mix formula.

B. Bituminous Plant Mix Base (Hot Mix) Type B or C:

1. This work shall consist of a foundation composed of a hot mixture of aggregate and asphalt prepared in a hot bituminous mixing plant. It shall be constructed in one (1) or more layers on a prepared mineral aggregate base, in accordance with Section 307 of the TDOT Standard Specifications.

2. Material shall be placed in reasonably close conformity with the lines, grades, thicknesses, and typical cross-sections shown in the Plans or as directed by the Engineer.

C. Asphaltic Concrete Surface (Hot Mix) – Grading E:

1. This work shall consist of an asphaltic concrete pavement composed of a mixture of coarse aggregate, fine aggregate, mineral filler if required, and asphalt cement.

2. The surface course shall be constructed on a prepared sub-base or mineral aggregate base as required in reasonably close conformity with the lines, grades, typical cross-sections, and rate of application shown on the Plans or as directed by the Engineer.

3. All work shall be performed in accordance with Section 411 of the TDOT Standard Specifications.

D. Bituminous Tack Coat:

1. Work shall consist of furnishing and applying bituminous material to a previously prepared base or surface to provide a bond for a superimposed course, in accordance with the requirements of Section 403 of the TDOT Standard Specifications.

2. Bituminous Materials – Materials shall conform to the following specifications:

a) Asphalt, Grade RC-70 or RC 250,

b) Emulsified Asphalt, SS-1, SS-1H, CSS-1, CSS-1H, or

c) Asphalt, Grade CRS-1 or CRS -2.

PART 3: EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

A. Weather Limitations: Bituminous plant mix may be placed on properly constructed and accepted subgrade or previously applied layers provided the following are met:

1. The subgrade and the surface upon which the bituminous plant mix is placed shall be free of excessive moisture.

2. The bituminous plant mix shall be placed in accordance with the temperature limitations of the following table and only when weather conditions otherwise permit the pavement to be properly placed, compacted, and finished.

Compacted Layer of Material Being Placed	Minimum Placement Temperature – Air or Surface (Whichever is Less)
Greater than 1-1/2″	40° F
1-1/2″ or Less	45° F

3. Unless otherwise permitted in writing, no bituminous plant mix with a compacted thickness of one and one-half inches (1-1/2″) or less shall be placed between November 30 and April 1; and further, no bituminous plant mix with a compacted thickness greater than one and one-half inches (1-1/2″) shall be placed between December 15 and March 16.

4. Where permission is granted to place mix during the above prohibited periods, the temperature requirements in the table above shall be increased ten degrees (10° F).

B. Conditioning of Existing Surface:

1. Existing pavement surfaces shall be free of deleterious material including dirt, grass, or other material, that would interfere with the bonding of the successive pavement layer.

2. Mineral aggregate base shall conform to the line and grade requirements of the Plans.

3. Contact surface of existing pavement, curbing, gutters, manholes, and other structures shall be painted with a thin, uniform coating of bituminous material (tack) prior to placement of the mixture against them.

4. The Contractor shall properly adjust all manholes, valve boxes, and catch basin frames to the finished grades of the pavement. Unless otherwise specified, such adjustments shall be made without compensation.

C. Spreading and Finishing: Spreading and finishing shall comply with the requirements of Section 407.14 of the TDOT Standard Specifications.

D. Density Requirements:

1. Bituminous Plant Mix Base, Gradings B and C, will be compacted to an average of ninety-two percent (92%) of theoretical density. No individual density test shall be less than ninety percent (90%) of theoretical density.

2. Asphaltic Concrete Surface Course, Grading E, will be compacted to an average of ninety-two percent (92%) of theoretical density. No individual density test shall be less than ninety percent (90%) of theoretical density.

3. The size of the lot and number of tests included in the average shall be determined by the Engineer.

4. Any base or surface course that tests below the minimum density shall be corrected until the density of the area is equal to or above the minimum before it can be used to determine the average density of the lot. No successive layer, where applicable, shall be placed until the area has been corrected.

E. Joints: Placing of the bituminous paving shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the Engineer. Transverse joints shall be formed by cutting back on the previous run to expose the full depth of the course. A brush coat of bituminous material shall be used on contact surfaces of transverse joints just before additional mixture is placed against the previously rolled material.

F. Surface Requirements: The surface shall be tested with a ten-foot (10') straightedge applied parallel to the centerline of the pavement the deviation of the surface from the testing edge of the straightedge shall not exceed 1/4" for surface course pavements.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

A. Bituminous Plant Mix Base, Type B or C: The quantity of base course to be paid for will be the actual amount of base course that has been incorporated into the completed and accepted work.

B. Asphaltic Concrete Surface Course, Grading: The quantity of surface course to be paid for will be the actual amount of surface course that has been incorporated into the completed and accepted work.

4.02 PAYMENT

A. Payment for asphalt shall be included in the unit prices line items shown in Bid Schedule for the work specified in this section.

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

A. This Section covers providing and installing the storm drainage and underdrainage collection systems, including pipe culverts, French drains, and appurtenant structures.

B. Storm drainage systems shall be constructed as shown on the Contract Drawings and as specified herein.

1.02 DELIVERY, STORAGE, AND HANDLING

A. All pipe and storm drainage material shall be unloaded and handled with reasonable care.

B. Pipe shall not be rolled or dragged over gravel or rock during handling.

C. When any joint or section of pipe is damaged during unloading or handling, the undamaged portions of the joint or section may be used where partial lengths are needed, or if damaged sufficiently, the Engineer will reject the joint or section as being unfit for installation, and the Contractor shall remove such rejected pipe from the project.

1.03 QUALITY ASSURANCE

Pipe and drainage materials shall meet the following reference requirements:

A. ASTM C76.....Reinforced Concrete Pipe;

B. ASTM C55.....Concrete Brick; and

C. AASHTO M-36.....Corrugated Metal Pipe.

1.04 SUBMITTALS

A. The Contractor shall submit for approval of the Engineer six (6) copies of shop drawings that describe in detail the materials to be utilized.

B. Prior to submittal, all shop drawings shall be reviewed by the Contractor, and shall be stamped and signed as to compliance with the referenced Specification. Any variance to the specification shall be noted.

C. The following shop drawings shall be submitted:

1. Drainage pipe;

2. Underdrain pipe;
3. Underdrain or pipe bedding;
4. Drainage structure castings; and
5. Precast drainage structures.

1.05 WARRANTY

All pipe and materials shall be warranted for a period of one (1) year following installation and acceptance by the Owner.

PART 2: PRODUCTS

2.01 REINFORCED CONCRETE PIPE

A. Reinforced concrete pipe shall conform to ASTM C-76, latest revision.

B. Pipe shall be Class III with Wall B, unless otherwise noted.

C. All pipe shall have interior surfaces free from roughness, projection, indentations, offset, or irregularities of any kind.

D. Joint material for reinforced concrete pipe shall be either "O"-ring type joints utilizing a rubber "O"-ring, or bell and spigot type utilizing a mastic joint material such as Ram-Neck or approved equal.

2.02 CORRUGATED METAL PIPE

A. Corrugated metal pipe shall conform to AASHTO M-36, latest revision. \

B. Bituminous coating, where required by the Drawings, shall consist of asphalt cement having a minimum thickness of 0.04" measured at the crest of the corrugations.

C. Paved inverts in corrugated metal pipe, where required by the Drawings, shall consist of asphalt cement applied on the inside of the pipe for one quarter (1/4) of its circumference (bottom of pipe when installed). The pavement shall have a minimum thickness of 0.50" tapering to 0.1" at the sides.

D. Corrugated metal pipe shall have 2-2/3" x 1/2" corrugations and shall be of the following minimum gauges:

Pipe Diameter (Inches)	Corrugated Metal Pipe Gauge
18 and smaller	16
21-30	14
38-48	12
56 and larger	10

C. Corrugated metal pipe shall have rerolled ends to accommodate corrugated coupling bands. Coupling bands shall conform to TDOT requirements. Dimple bands shall not be used.

2.03 CASTINGS

A. Castings shall be sound and free from warp, holes, and other defects that impair their strength or appearance.

B. Exposed surfaces shall have a smooth finish and sharp, well-defined lines, and arises.

C. Machined joints, where required, shall be milled to a close fit. Provide all necessary lugs and brackets so that work can be assembled in a neat, substantial manner.

2.04 AGGREGATE FOR UNDERDRAINS

Aggregate for underdrains shall be washed stone, standard size #67, per Tennessee Department of Transportation specifications.

PART 3: EXECUTION

3.01 PREPARATION OF PIPE FOUNDATION

A. LINES AND GRADES

1. The pipe foundation shall be prepared to be uniformly firm and shall be true to the lines and grades as shown on the Plans.

2. Any deviation or field adjustments will require the approval of the Engineer.

3. When an Inspector is present on the site and is so requested by the Contractor, he shall check the position of grades and lines; but the Contractor shall be responsible for the finished drain line being laid to exact and proper line and grade.

B. PIPE FOUNDATION

1. Whenever the nature of the ground will permit, the excavation at the bottom of the trench shall have the shape and dimensions of the outside lower third of the circumference of the pipe.

2. Care shall be taken to secure a firm bearing support uniformly throughout the length of the pipe. A space shall be excavated under and around each bell to sufficient depth to relieve it of any load and to allow ample space for filling and finishing the joint.

3. The pipe, when thus bedded firmly, shall be on the exact grade. In case the bed shaped in the bottom of the trench is too low, the pipe shall be completely removed from position, and earth of suitable quality shall be placed and thoroughly tamped to prepare a new foundation for the pipe.

4. In no case shall the pipe be brought to grade by blocking up under the barrel or bell of same, but a new and uniform support must be provided for the full length of the pipe.

5. Where rock or boulders are encountered in the bottom of the trench, the same shall be removed to such depth that no part of the pipe, when laid to grade, will be closer to the rock or boulders than six inches (6”).

6. A suitably tamped and shaped foundation of suitable earth shall be placed to bring the bottom of the trench to proper subgrade over rock or boulders.

7. Where the foundation material is found to be of poor supporting value, the Engineer may make minor adjustments in the location of the pipe to provide a more suitable foundation.

8. Where this is not practical, the foundation shall be conditioned by removing the existing foundation material by undercutting to the depth as directed by the Engineer, within the limits established on the Plans, and backfilling with either a suitable local material secured from unclassified excavation or borrow excavation at the nearest accessible location along the project, or foundation conditioning material consisting of crushed stone or gravel, or a combination of sand and crushed stone or gravel approved by the Engineer as being suitable for the purpose intended. The selection of the type of backfill material to be used for foundation conditioning will be made by the Engineer.

C. WATER IN TRENCHES

1. The Contractor shall remove all water that may be encountered or that may accumulate in the trenches by pumping or bailing; and no pipes shall be laid until the water has been removed from the trench.

2. The Contractor will not be permitted to drain water through the storm drain within a period of twenty-four (24) hours after the pipe has been laid, and the open end of the pipe in the trench shall be kept closed with a tight-fitting plug to prevent washing of dirt or debris into the line.

3. Water so removed from the trench must be disposed of in such manner as not to cause injury to work completed or in progress.

D. SPECIAL FOUNDATIONS

Whenever the bottom of the trench shall be of such nature as to provide unsatisfactory foundation for the pipe, the Engineer will require the pipe to be laid on timber or concrete cradle foundations. Such foundations whether of single plank, plank cradle, plank cradle supported on piles, or poured concrete cradle, shall be placed by the Contractor; and the Contractor will be compensated for the materials so used.

3.02 LAYING PIPE

A. GENERAL

All piping is to be installed in strict accordance with the Manufacturer's recommendations. Installation manuals from various material Suppliers shall be furnished the Engineer for his review and approval prior to installation of any material. The Engineer may augment any manufacturer's installation recommendations, if in his opinion it will best serve the interest of the Owner.

B. LAYING PIPE

1. No pipe shall be laid except in the presence of the Engineer or his inspector, or without special permission from the Engineer. Proper tools, implements, and facilities satisfactory to the Engineer shall be provided and used for the safe and convenient prosecution of pipe laying.

2. All pipe, fittings, valves, and other materials used in the laying of pipe will be lowered into the trench piece by piece by means of suitable equipment in such a manner to prevent damage to the

pipe materials, to the protective coating on the pipe materials, and to provide a safe working condition to all personnel in the trench.

3. Each piece of pipe being lowered into the trench shall be carefully given a final inspection to see that it is clean, sound, and free of defects.

4. It shall be laid on the prepared foundation to produce a straight line on a uniform grade, each pipe being laid as to form a close abutted joint with a preceding pipe, so as to form a smooth and straight inside flow line.

5. Each pipe will be tested for its exact position after it is in its final position.

6. The pipes shall be fitted together in order to ensure sufficient space for joint gaskets, and other jointing material.

7. Pipe shall be removed at any time if broken, injured or displaced in the process of laying same, or of backfilling the trench.

8. When cutting short lengths of pipe, a pipe cutter, as approved by the Engineer, will be used, and care will be taken to make the cut at right angles to the center line of the pipe, or on the exact skew as shown on the Plans. In the case of push-on pipe, the cut ends shall be tapered with a portable grinder or course file to match the manufactured taper.

9. When coupling bands for annular or helical corrugated metal pipe are used, the pipe sections shall be joined and fully bolted so that the circumferencial and longitudinal strength will be sufficient to preserve the alignment, to prevent separation of the sections, and to prevent infiltration of backfill material.

3.03 BACKFILLING

A. The backfill around the pipe shall be placed in layers not to exceed six inches (6") loose and compacted to ninety-five percent (95%) Standard Proctor test for all areas directly beneath subgrade (one hundred percent (100%) for the top two feet (2') of subgrade beneath pavements).

B. From the bottom of the trench to the centerline of the pipe the backfill material shall be compacted by approved hand tamps. From the centerline of the pipe to the top of the trench other mechanical tamps, as approved by the Engineer, may be used. All backfill material shall have been approved by the Engineer.

C. Select backfill material shall be used when called for on the Plans. Select backfill shall be transported to the site by the Contractor from outside the

project limits to be used as backfill material. Material excavated in conjunction with the construction of the project is not considered select backfill for payment purposes. The Engineer shall approve the borrow source and all select backfill material. Select backfill shall be high quality clay soil and shall be free of foreign debris such as roots and rock. Stone shall not be acceptable in place of select backfill.

D. Care shall be taken during backfill and compaction operations to maintain alignment and prevent damage to the joints. Pipe that becomes misaligned, shows excessive settlement, or has been otherwise damaged by the Contractor's operations shall be removed and replaced by the Contractor at no cost to the Owner.

E. The backfill shall be kept free from stones, frozen lumps, chunks of highly plastic clay, or other objectionable materials.

F. All pipe backfill areas shall be graded and maintained in such a condition that erosion or saturation will not damage the pipe bed or backfill.

G. Heavy equipment shall not be operated over any pipe until it has been properly backfilled and has a minimum cover as required by the Plans.

H. Where any part of the required cover is above the proposed finish grade, the Contractor shall place, maintain, and finally remove such material at no cost to the Owner.

3.04 TESTING

A. Upon completion, installed lines shall show a full circle of light when lamped between catch basins. This test shall be performed by the Engineer.

B. Other tests may be required by the Engineer, such as exfiltration. In this event the results shall meet the minimum standards that the Manufacturer states are obtainable.

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

The work covered by this Section consists of the construction of reinforced concrete or brick masonry inlets, catch basins, junction boxes, and other minor drainage structures, excluding headwalls, together with all necessary metal grates, covers, frames, and other hardware, in accordance with the requirements shown on the Plans and the provisions of these Specifications.

1.02 QUALITY ASSURANCE

All precast concrete structures and other fabricated materials shall be provided by Manufacturers with at least five (5) years of experience in the manufacture of similar materials.

1.03 SUBMITTALS

SHOP DRAWINGS

The Contractor shall submit at least six (6) copies of shop drawings to the Engineer, including dimensional drawings, materials of construction, catalogue cut sheets, and other pertinent information.

1.04 DELIVERY, STORAGE, AND HANDLING

All materials shall be delivered, stored and handled in strict accordance with the Manufacturer's recommendations, and in a manner that preserves the structural integrity of the materials.

1.05 WARRANTY

All materials and equipment shall be warranted to be free from defects in workmanship and materials for one (1) year after final acceptance.

PART 2: PRODUCTS

2.01 MATERIALS

A. CONCRETE AND MASONRY

1. All concrete shall be Class B, 4,000 psi, unless otherwise indicated on the Plans.

2. Where necessary to fit field conditions, the dimensions of the structure and footings shall be varied as directed by the Engineer.

B. FITTINGS AND CONNECTIONS

1. Where fittings enter the masonry, they shall be placed as the work is built up, thoroughly bonded, and accurately spaced and aligned.

2. Pipe connections shall be cut off flush with the inside wall of the drainage structure and grouted as necessary to make smooth and uniform surfaces on the inside of the structure.

3. Metal frames for grates and covers shall be set in full mortar beds or secured by methods approved by the Engineer.

C. BACKFILL

After the structure has been completed and all forms, falsework, sheeting, and bracing have been removed, the excavation shall be backfilled with approved material compacted to a density of ninety-five percent 95% Standard Proctor. Backfilling shall not be done until the concrete or brick masonry has cured for at least seven (7) curing days, unless otherwise permitted by the Engineer.

D. PIPE COLLARS AND PIPE PLUGS

Pipe collars and pipe plugs shall be constructed in accordance with the details shown on the Plans or as directed by the Engineer.

PART 3: EXECUTION

3.01 INSTALLATION

A. Drainage structures shall be built to the lines, grades, and dimensions as shown on the Plans. The Contractor shall adjust the final grades in the

field as necessary to provide positive drainage to the structures or to match final pavement or grade elevation.

B. Excavations for drainage structures shall be made with care so as not to disturb the surrounding areas more than necessary. All excavations shall be maintained water free until completion of the drainage structure, including backfilling. The Contractor shall provide adequate pumping capacity as required.

C. Where the foundation material is found to be of poor supporting value, the existing foundation material shall be removed by undercutting to the depth directed by the Engineer and backfilled with suitable material secured from locations along the project or from a borrow pit. The backfill placed in the undercut area shall be compacted to a degree satisfactory to the Engineer.

D. For cast-in-place structures, the Contractor shall use care in placing rebar and concrete. Unless otherwise approved, the bottom slabs shall be poured separate from the walls. A minimum of seven (7) curing days shall be provided between completion of pouring the bottom and the walls.

E. When drainage structures are constructed with concrete brick, only new, sound brick shall be used. Mortar mix shall be mixed on site using an approved mortar mix consisting of Portland cement (Type S) and clean sand. Following construction of the drainage boxes, both the interior and exterior shall be plastered with a minimum one-half inch (1/2″)-thick coat of Portland cement and sand mixture.

3.02 QUALITY CONTROL AND FIELD TESTING

The Contractor shall demonstrate to the Owner and Engineer that all drainage structures operate as intended and designed. All drainage structures shall be field tested by the Contractor in the presence of the Engineer prior to final acceptance.

END OF SECTION

SECTION 02905 RESTORATION OF SURFACES

PART 1: GENERAL

1.01 SCOPE OF WORK

A. This Section covers the furnishing of all labor, equipment, and materials necessary for the proper restoration of existing surfaces disturbed or damaged as a result of construction operations that are not specifically scheduled or specified for topsoil and seeding, paving, landscaping, or other surfacing.

B. In general, the types of replacement included in this section are seeding along pipelines, concrete sidewalks, driveways, roadways, ditches, lawns and landscaped areas, and curb and gutter.

C. Any damage to existing structures shall be repaired using materials and workmanship equal to or better than those of original construction.

PART 2: NOT USED

PART 3: EXECUTION

3.01 RESTORATION OF SURFACES

A. Seeding Along Pipelines:

1. All ground surfaces along pipelines that are not classified as lawns, landscaped areas, or pavement areas, but would be classified as open fields, shall be raked smooth and seeded in accordance with the Section 02931, Seeding, Fertilizing, and Mulching. Large rocks, clumps of earth, and excessive spoil material shall be removed from the area prior to seeding.

2. Shoulders of all roads shall be restored as specific for lawns and landscaped areas.

3. Wooded areas not classified as lawns shall be restored to as near their original condition as possible.

B. Lawns and Landscaped Areas:

1. Lawns and landscaped areas shall be regraded and replaced as follows:

a) Grading shall be to the grade existing before construction of the work under this Contract.

b) Lawn replacement shall be in accordance with Section 02931, Seeding, Fertilizing, and Mulching. Topsoiled areas shall be replaced with topsoil of equal quality and quantity.

2. Landscaped areas shall be replaced with shrubs, hedges, ornamental trees, flowers, or other items to original condition.

C. Concrete Sidewalks:

1. Concrete walks removed in connection with, or damaged as a result of, construction operations under the Contract shall be replaced with new construction. Such walks shall be constructed of Class A concrete on a thoroughly compacted subgrade or mineral aggregate base as shown. Concrete sidewalks shall be no less than four inches (4") thick; if sidewalk to be replaced is greater than four inches (4") thick, the replacement shall be the thickness of the original walk.

2. Walks shall be float finished, edged with an edging tool, and grooved at intermediate intervals not in excess of the width of the walk, uniform throughout the length of the walk in any one direction.

D. Driveways:

1. Unpaved driveways shall be surfaced with not less than three inches (3") of mineral aggregate base, topped with three inches (3") of stone, gravel, or other materials equal to that found in the original driveway. Driveways shall be left in a condition better than their original condition.

2. Unless otherwise specified, concrete drives shall be replaced with Class A concrete and shall have equal thickness and reinforcing steel to that of the original drive. Prior to placing the concrete, a six-inch (6") layer of compacted mineral aggregate base shall be placed in the drive area.

3. Bituminous or asphaltic concrete drives shall be restored with a six inch (6") layer of compacted mineral aggregate base and a two inch (2") layer of compacted asphaltic concrete surface (hot mix), grading E.

E. Roadway Replacement:

1. Bituminous or asphaltic pavements shall include all areas paved with blacktop; built-up pavements of oil and stone or tar and stone; and similar pavements constructed with a bituminous or asphalt and stone materials.

2. Immediately upon completion of installation of underground piping and structures, the trench shall be backfilled, and the roadway shall be repaired. Unless otherwise noted, in the excavated area, the repair shall consist of a six-

inch (6″) aggregate base course, four-inch (4″) HB Binder Course, and a two-inch (2″) surface course as defined in Section 02575, Bituminous Pavement Repairs. If, in the opinion of the Engineer, the area adjacent to the excavation has not been damaged to the extent that the base course need to be replaced, restoration may consist of a surface course of sufficient thickness to meet the existing pavement.

3. Portland cement concrete roadways shall be replaced with Class A concrete and shall have equal thickness and reinforcing steel as the original roadway. A mineral aggregate base layer of six inches (6″) compacted thickness shall be placed prior to the placing of concrete.

4. Differential settlement of restored pavements shall be corrected immediately.

5. The Contractor shall repair and restripe any traffic markings that were damaged, removed, or covered during construction. All work shall be done in accordance with TDOT requirements and specifications.

6. All existing manhole and valve covers shall be raised as required by the Contractor prior to paving. The cost of this work shall be included in the unit bid prices for other related work, and no additional payment shall be made, unless otherwise noted.

F. Ditches: Ditches shall be regraded to the original grade and line. The surface of all ditches shall be returned to the same condition as found before commencing work and provide positive drainage.

G. Curb and Gutter: Curb and gutter removed with, or damaged as a result of construction operations, or injured or disturbed by the Contractor, his agents, or employees, shall be replaced with new construction to a condition similar and equal to that existing before damage was incurred. Class A concrete shall be used in curb and gutter replacement.

H. Damage to Structures: Any damage to existing structures shall be repaired of materials and workmanship equal to those of original construction. Extensively damaged structures, where the structural stability has been affected or that cannot be repaired in a suitable fashion shall be replaced entirely. Replacement shall not commence until approval of the plan of replacement has been given by the Engineer. Replacement costs shall be the responsibility of the Contractor.

PART 4: MEASUREMENT AND PAYMENT

4.01 PAYMENT

A. The work specified in this section shall be considered incidental to the other work in the project and no payment shall be made.

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

The work of this Section consists of furnishing and placing topsoil for turf areas to be seeded, fertilized, and mulched. No topsoil shall be furnished, nor will be paid for, under this Section until all job stockpiles have been exhausted.

1.02 SUBMITTALS

Submit six (6) copies of soil analysis certificates covering grain size and additive recommendations from the State University Agricultural Extension Service or other certified testing laboratory.

1.03 DELIVERY

Do not deliver topsoil in frozen or muddy condition.

PART 2: PRODUCTS

2.01 MATERIALS

Natural, friable, loamy soil, typical of local topsoil that produces heavy vegetative growth; free from subsoil, weeds, sods, stiff clay, stones larger than one inch (1"), toxic substances, litter, or other foreign material harmful to plant growth; having a pH between 6.0 and 7.0.

GRADING ANALYSIS

Sieve	Minimum Percent Passing
2-inch	100
# 4	90
# 10	80

Topsoil shall contain sand, silt, and clay as required by AASHTO M146.

	Minimum Percent	Maximum Percent
Sand	20	75
Silt	10	60
Clay	5	30

PART 3: EXECUTION

3.01 PREPARATION

Do not perform tilling operations when ground is frozen or excessively wet.

3.02 INSTALLATION

A. Use equipment and methods to prevent damage to existing structures, utilities, lawns, and plantings.

B. Prior to placing topsoil, shape the subgrade to graded lines and cross- sections to provide for two inches (2″) of compacted topsoil. Clear the subgrade of materials larger than two inches (2″). Excavate to depth of twelve inches (12″) all areas that have become saturated with oil, gasoline, or bituminous products; backfill with approved material.

C. After alignment of subgrade, loosen, and till to a depth of six inches (6″) by discing, harrowing, rototilling, or other approved methods.

D. After approval, place and spread topsoil to secure required depth after compaction; rake and remove materials larger than two inches (2″). Compact with approved roller equipment. Finish smoothing even and true to lines and grades indicated.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will be number of cubic yards, measured in vehicle at point of delivery.

4.02 PAYMENT

Quantities so measured will be paid for at the Contract unit price.

END OF SECTION

SECTION 02931 SEEDING, FERTILIZING, AND MULCHING

PART 1: GENERAL

1.01 SCOPE OF WORK

A. This Section covers the furnishing of all labor, equipment, and materials necessary for the establishment of vegetation of all areas of the site disturbed by construction operations and all earth surfaces of embankments, including rough and fine grading, topsoil if required, fertilizer, lime, seeding, and mulching.

B. The Contractor shall adapt his operations to variations in weather or soil conditions as necessary for the successful establishment and growth of the grasses or legumes.

PART 2: PRODUCTS

2.01 MATERIALS

A. FERTILIZER

1. The quality of fertilizer and all operations in connection with the furnishing of this material shall comply with regulations adopted by the Tennessee Department of Agriculture.

2. Fertilizer shall be 10-10-10 grade. Upon written approval of the Engineer, a different grade of fertilizer may be used, provided the rate of application is adjusted to provide the same amounts of plant food.

3. During handling and storing, the fertilizer shall be cared for in such a manner that it will be protected against hardening, caking, or loss of plant food values. Any hardened or caked fertilizer shall be pulverized to its original condition before being used.

B. LIME

1. The quality of lime and all operations in connection with the furnishing of this material shall comply with the requirements of the Tennessee Department of Agriculture.

2. During the handling and storing, the lime shall be cared for in such a manner that it will be protected against hardening and caking. Any hardened or caked lime shall be pulverized to its original condition before being used.

3. Lime shall be agriculture-grade ground dolomitic limestone. It shall contain not less than eighty-five percent (85%) of the calcium and magnesium carbonates and shall be of such fineness that at least ninety percent (90%) will pass a #10 sieve and at least fifty percent (50%) will pass a #100 sieve.

C. SEED

1. The quality of seed and all operations in connection with the furnishing of this material shall comply with the regulations adopted by the Tennessee Department of Agriculture.

2. Seed shall have been approved by the Tennessee Department of Agriculture or any agency approved by the Engineer before being sown, and no seed will be accepted with a date of test more than nine (9) months prior to the date of sowing. Such testing however, will not relieve the Contractor from responsibility for furnishing and sowing seed that meets these Specifications at the time of sowing.

3. When a low percentage of germination causes the quality of the seed to fall below the minimum pure live seed specified, the Contractor may elect, subject to the approval of the Engineer, to increase the rate of seeding sufficiently to obtain the minimum pure live seed contents specified, provided that such an increase in seeding does not cause the quantity of noxious weed seed per square yard to exceed the quantity that would be allowable at the regular rate of seed.

4. Seed shall be entirely free from bulblets or seed of Johnson grass, nutgrass, sandbur, wild onion, wild garlic, and Bermuda grass. The Specifications for restricted noxious weed seed refers to the number per pound, singly or collectively, of blessed thistle, wild radish, Canada thistle, corncockle, field bindweed, quackgrass, dodders, dock, horsenettle, bracted plantain, buckhorn, or wild mustard; but in no case shall the number of blessed thistle or wild radish exceed twenty-seven (27) seeds of each per pound. No tolerance on weed seed will be allowed.

5. During handling and storing, the seed shall be cared for in such a manner that it will be protected from damage by heat, moisture, rodents, or other causes.

D. MULCH

Straw mulch shall be threshed straw of oats, rye, or wheat free from matured seed of obnoxious weeds or other species that would grow and be detrimental to the specified grass.

E. TACKIFIER

1. Emulsified asphalt or organic tackifier such as Reclamare R2400 shall be sprayed uniformly on mulch as it is ejected from blower or immediately thereafter.

2. Tackifier shall be applied evenly over area, creating uniform appearance.

3. Rates of application will vary with conditions.

4. Asphalt shall not be used in freezing weather.

PART 3: EXECUTION

3.01 PREPARATION

A. PROTECTION OF EXISTING TREES AND VEGETATION

1. Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking, or skinning of roots; skinning and bruising of bark; smothering of trees by stockpiling construction materials or excavated materials within drip line; excess foot or vehicular traffic; or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing.

2. Provide protection for roots over one and a half inch (1-1/2") diameter cut during construction operations. Coat cut faces with an emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out and cover with earth as soon as possible.

3. The Contractor shall not remove or damage trees and shrubs that are outside the clearing limits established by the Owner or those within the clearing limits designated to remain.

4. Repair trees scheduled to remain and damaged by construction operations in a manner acceptable to the Engineer. Repair damaged trees promptly to prevent progressive deterioration caused by damage.

5. Replace trees scheduled to remain and damaged beyond repair by construction operations, as determined by the Engineer, with trees of similar size and species. Repair and replacement of trees scheduled to remain and damaged by construction operations or lack of adequate protection during construction operations shall be at the Contractor's expense.

B. GRADING

1. Rough grading shall be done as soon as all excavation required in the area has been backfilled. The necessary earthwork shall be accomplished to bring the existing ground to the desired finish elevations as shown on the Contract Drawings or otherwise directed.

2. Fine grading shall consist of shaping the final contours for drainage and removing all large rock, clumps of earth, roots, and waste construction materials. It shall also include thorough loosening of the soil to a depth of six inches (6") by plowing, discing, harrowing, or other approved methods until the area is acceptable as suitable for subsequent landscaping operations. The work of landscaping shall be performed on a section by section basis immediately upon completion of earthwork.

3. Upon failure or neglect on the part of the Contractor to coordinate his grading with seeding and mulching operations and diligently pursue the control of erosion and siltation, the Engineer may suspend the Contractor's grading operations until such time as the work is coordinated in a manner acceptable to the Engineer.

C. SEEDBED PREPARATION

1. The Contractor shall cut and satisfactorily dispose of weeds or other unacceptable growth on the areas to be seeded. Uneven and rough areas outside of the graded section, such as crop rows, farm contours, ditches and ditch spoil banks, fence line and hedgerow soil accumulations, and other minor irregularities that cannot be obliterated by normal seedbed preparation operations, shall be shaped and smoothed as directed by the Engineer to provide for more effective seeding and for ease of subsequent mowing operations.

2. The soil shall then be scarified or otherwise loosened to a depth of not less than six inches (6") except as otherwise provided below or otherwise directed by the Engineer. Clods shall be broken and the top two to three inches (2-3") of soil shall be worked into an acceptable seedbed by the use of soil pulverizers, drags, or harrows, or by other methods approved by the Engineer.

3. On 2:1 slopes, a seedbed preparation will be required that is the same

depth as that required on flatter areas, although the degree of smoothness may be reduced from that required on the flatter areas if so permitted by the Engineer.

4. On cut slopes that are steeper than 2:1, both the depth of preparation and the degree of smoothness of the seedbed may be reduced as permitted by the Engineer, but in all cases the slope surface shall be scarified, grooved, trenched, or punctured so as to provide pockets, ridges, or trenches in which the seeding materials can lodge.

5. On cut slopes that are either 2:1 or steeper, the Engineer may permit the preparation of a partial or complete seedbed during the grading of the slope. If at the time of seeding and mulching operations such preparation is still in a condition acceptable to the Engineer, additional seedbed preparation may be reduced or eliminated.

6. The preparation of seedbeds shall not be done when the soil is frozen, extremely wet, or when the Engineer determines that it is in an otherwise unfavorable working condition.

D. APPLICATION RATES

Seed shall be applied by means of a hydro-seeder or other approved method. The rates of application of seed, fertilizer, and limestone shall be as stated below.

1. Lime and Fertilizer

Lime and Fertilizer application rates shall be based on soil test recommendations. Soils with a pH of 6 or higher do not need to be limed. In the absence of a soil test, the following rates of application of limestone and fertilizer shall be:

a. 1-1.5 tons/acre of ground agricultural limestone on coarse textured soils and 2-3 tons/acre of ground agricultural limestone on fine textured soils; and
b. 700-1,000 pounds 10-10-10 (N-P_2O_5-K_2O) fertilizer per acre, and the remaining quantity applied when vegetation is three inches (3") in height or forty-five (45) days after seeding, whichever comes first.

2. Mulch

Mulch shall be applied at the following rates per acre:

a. 3,000-4,000 pounds straw mulch,
b. 1,500-2,000 pounds wood cellulose fiber;

c. 35-40 cubic yards of shredded or hammermilled hardwood bark; or

d. 1,200-1,400 pounds of fiberglass roving.

3. Seed

The kinds of seed and the rates of application shall be as prescribed in the Tennessee Erosion and Sediment Control Handbook 4th Ed. August 2012 based on Region and site conditions

Temporary Seeding Recommendations for Late Winter Early Spring

Species		**Rate (lb/acre)**
Rye		120
Seeding Dates		
East TN	Above 2500 feet:	Feb 15-May 15
	Below 2500 feet	Feb 1-May 1
Middle TN		Jan 1-May 1
West TN		Dec 1-Apr 15

Soil Amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring toll. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Re-fertilize if growth is not fully adequate. Reseed, re-fertilized and mulch immediately following erosion or other damage.

Temporary Seeding Recommendations for Summer

Species	**Rate (lb/acre)**
Oats	60
Brown top millet	30

Seeding Dates

East TN	May 15-Aug 15
Middle TN	May 1-Aug 15
West TN	Apr 15-Aug 15

Soil Amendments

Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring toll. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Re-fertilize if growth is not fully adequate. Reseed, re-fertilized and mulch immediately following erosion or other damage.

Temporary Seeding Recommendations for Fall

Species	**Rate (lb/acre)**
Oats	30
Winter Wheat	30

Seeding Dates

East TN	Aug 15-Dec 15
Middle TN	Aug 15–Dec 30
West TN	Aug 15-Dec 30

Soil Amendments

Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting or a mulch anchoring toll. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Re-fertilize if growth is not fully adequate. Reseed, re-fertilized and mulch immediately following erosion or other damage. If necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre crimson clover in late February or early March

PREFERRED SEED MIXES USING NATIVES OR NATURALIZED PLANTS AND PLANTING DATES

Zone		Best	Marginal	Preferred Rate/Mix (lb/ac PLS)
Region II	Low maintenance; Slopes and poor, shallow soils			15 Browntop millet* (nurse crop)
				5 Little Bluestem
				2 switch grass
		Aug 25-Sept 15	Sept 15 - Oct 25	2 tall dropseed
		Feb15 - May 30	Mar 21 - May 30	5 sideoats gramma
				2 black-eyed susan
				2 partridge pea
				1 greyheaded coneflower
	Low maintenance; Moderate slopes; soils > 6 in. Depth			15 Browntop millet* (nurse crop)
				5 purpletop
				5 Little Bluestem
		Aug 25-Sept 15	Sept 15 - Oct 25	5 Virginia wild rye
		Feb15 - May 30	Mar 21 - May 30	2 black-eyed susan
				2 partridge pea
				1 greyheaded coneflower
	High maintenance			15 Browntop millet* (nurse crop)
				2 partridge pea
		Aug 30 - Oct 15	Feb 15 - Apr 15	45 Red fescue*
				45 hard fescue*
				25 chewing fescue*
Region III	>2500 ft elevation steep slopes		Aug 15-Aug 30	15 Browntop millet* (nurse crop)
		Mar 20-Apr 30	Mar 1-Mar20	5 purpletop
			Apr 20-Jun15	10 little bluestem
	<2500 ft elevation; steep slopes			10 Indian grass
		Aug 15-Sept 1	Sept 1-Sept 15	2 black-eyed susan
		Mar 1-Apr1	Apr 1- Jun 10	0.5 monarda (bergamot)
				4 Maryland senna
	>2500 ft elevation; shallow soils		Aug 15-Aug 30	15 Browntop millet* (nurse crop)
		Mar 20-Apr 20	Mar 5-Mar 20	4 purpletop
			Apr 20-Jun15	10 little bluestem
	<2500 ft elevation; shallow soils			10 broomsedge
		Aug 15-Sept 1	Sept 1-Sept 15	2 partridge pea
		Mar 1-Apr1	Apr 1- Jun 10	2 black-eyed susan
				0.5 monarda (bergamot)
	>2500 ft elevation; moderate slopes		Aug 15-Aug 30	15 Browntop millet* (nurse crop)
		Mar 20-Apr 20	Mar 5-Mar 20	4 purpletop
			Apr 20-Jun15	10 little bluestem
	<2500 ft elevation; steep slopes			10 Indian grass
		Aug 15-Sept 1	Sept 1-Sept 15	2 black-eyed susan
		Mar 1-Apr1	Apr 1- Jun 10	0.5 monarda (bergamot)
				4 Maryland senna
	>2500 ft elevation; high maintenance		Aug 15-Aug 30	15 Browntop millet* (nurse crop)
		Mar 20-Apr 20	Mar 5-Mar 20	45 Red fescue*
			Apr 20-Jun15	45 hard fescue*
	<2500 ft elevation; high maintenance	Aug 15-Sept 1	Sept 1-Sept 15	25 chewing fescue*
		Mar 1-Apr1	Apr 1- Jun 10	

Note: above table is referenced from the TN Erosion and Sediment Control Handbook 4th Ed.

ALLOWABLE SEED MIXES AND PLANTING DATES

Zone		Best	Marginal	Preferred Rate/Mix (lb/ac PLS)
Region II	Low maintenance; Slopes and poor, shallow soils			80 Pensacola bahiagrass
		Feb 1-Mar 20	Mar 20-Apr 30	30 Bermudagrass (hulled)
		Sept 1-Sept 30	Sept 30- Oct 31	20 Korean lespedeza**
				15 Kobe lespedeza**
	Low maintenance; Moderate slopes; soils > 6 in. Depth			50 Pensacola bahiagrass
		Apr 1-July 15		15 Bermudagrass (hulled)
				30 Korean lespedeza**
				15 foxtail millet**
	High maintenance	Apr 1-July 15		40 Bermudagrass (hulled)
Region III	>2500 ft elevation steep slopes		Jul 15-Aug 15	
		July 25-Aug 15	Aug 15-Aug30	100 KY 31 fescue**
		Mar20-Apr20	Mar 1-Mar 20	20 Kobe lespedeza**
			Apr 20-May 15	10 Korean lespedeza**
	<2500 ft elevation; steep slopes		Jul 25-Aug 15	5 Redtop
		Aug 15-Sept 1	Sept 1-Sept 15	
		Mar 1-Apr 1	Apr 1-May 10	
	>2500 ft elevation; shallow soils		Jul 15-Aug 15	
		July 25-Aug 15	Aug 15-Aug30	40 KY 31 Fescue**
		Mar20-Apr20	Mar 1-Mar 20	10 Korean lespedeza**
			Apr 20-May 15	10 Redtop
	<2500 ft elevation; shallow soils		Jul 25-Aug 15	10 Crown vetch**
		Aug 15-Sept 1	Sept 1-Sept 15	
		Mar 1-Apr 1	Apr 1-May 10	
	>2500 ft elevation; moderate slopes		Jul 15-Aug 15	
		July 25-Aug 15	Aug 15-Aug30	
		Mar20-Apr20	Mar 1-Mar 20	60 KY 31 Fescue**
			Apr 20-May 15	15 Korean lespedeza**
	<2500 ft elevation; steep slopes		Jul 25-Aug 15	15 Kobe lespedeza**
		Aug 15-Sept 1	Sept 1-Sept 15	
		Mar 1-Apr 1	Apr 1-May 10	
	>2500 ft elevation; high maintenance		Jul 15-Aug 15	
		July 25-Aug 15	Aug 15-Aug30	
		Mar20-Apr20	Mar 1-Mar 20	
			Apr 20-May 15	200 KY 31 Fescue
	<2500 ft elevation; high maintenance		Jul 25-Aug 15	
		Aug 15-Sept 1	Sept 1-Sept 15	
		Mar 1-Apr 1	Apr 1-May 10	

Note: above table is referenced from the TN Erosion and Sediment Control Handbook 4th Ed.

E. APPLICATION

1. Equipment to be used for the application, covering, or compaction of limestone, fertilizer, and seed shall have been approved by the Engineer before being used on the project. Approval may be revoked at any time if equipment is not maintained in satisfactory working condition, or if the equipment operation damages the seed.

2. Limestone, fertilizer, and seed shall be applied within twenty-four (24) hours after completion of seedbed preparation, unless otherwise permitted by the Engineer, but no limestone or fertilizer shall be distributed, and no seed shall be sown when the Engineer determines that weather and soil conditions are unfavorable for such operations.

3. Limestone may be applied as a part of the seedbed preparation, provided it is immediately worked into the soil. If not so applied, limestone and fertilizer shall be distributed uniformly over the prepared seedbed at the specific rate of application and then harrowed, raked, or otherwise thoroughly worked or mixed into the seedbed.

4. Seed shall be distributed uniformly over the seedbed at the required rate of application, and immediately harrowed, dragged, raked, or otherwise worked so as to cover the seed with a layer of soil. The depth of covering shall be as directed by the Engineer. If two kinds of seed are to be used that require different depths of covering, they shall be sown separately.

5. When a combination seed and fertilizer drill is used, fertilizer may be drilled in with the seed after limestone has been applied and worked into the soil. If two kinds of seed are being used that require different depths of covering, the seed requiring the lighter covering may be sown broadcast or with a special attachment to the drill or drilled lightly following the initial drilling operation.

6. When a hydraulic seeder is used for application of seed and fertilizer, the seed shall not remain in water containing fertilizer for more than thirty (30) minutes prior to application, unless otherwise permitted by the Engineer.

7. Immediately after seed has been properly covered the seedbed shall be compacted in the manner and degree approved by the Engineer.

8. When adverse seeding conditions are encountered due to steepness of slope, height of slope, or soil conditions, the Engineer may direct or permit that modifications be made in the above requirements that pertain to incorporating limestone into the seedbed; covering limestone, seed, and fertilizer; and compaction of the seedbed.

9. Such modifications may include, but are not limited to, the following:

   a. The incorporation of limestone into the seedbed may be omitted on:

      i. Cut slopes steeper than 2:1;

      ii. 2:1 cut slopes when a seedbed has been prepared during the excavation of the cut and is still in an acceptable condition; or

      iii. Areas of slopes where the surface of the area is too rocky to permit the incorporation of the limestone.

   b. The rates of application of limestone, fertilizer, and seed on slopes 2:1 or steeper or on rocky surfaces may be reduced or eliminated.

   c. Compaction after seeding may be reduced or eliminated on slopes 2:1 or steeper, on rocky surfaces, or on other areas where soil conditions would make compaction undesirable.

F. MULCHING

1. All seeded areas shall be mulched unless otherwise indicated in the special provisions or directed by the Engineer.

2. Mulch shall be spread uniformly at a rate of two (2) tons per acre in a continuous blanket over the areas specified.

3. Before mulch is applied on cut or fill slopes that are 3:1 or flatter, and ditch slopes, the Contractor shall remove and dispose of all exposed stones in excess of three inches (3") in diameter and all roots or other debris that will prevent proper contact of the mulch with the soil.

4. Mulch shall be applied within twenty-four (24) hours after the completion of the seeding, unless otherwise permitted by the Engineer. Care shall be exercised to prevent displacement of soil or seed or other damage to the seeded area during the mulching operations.

5. Mulch shall be uniformly spread by hand or by approved mechanical spreaders or blowers that will provide an acceptable application. An acceptable application will allow some sunlight to penetrate and air to circulate but also partially shade the ground, reduce erosion, and conserve soil moisture.

6. Mulch shall be held in place by applying a sufficient amount of asphalt or other approved binding material to ensure that the mulch is properly held in place. The rate and method of application of binding material shall meet the approval of the Engineer. Where the binding material is not applied directly with the mulch it shall be applied immediately following the mulch operation.

7. The Contractor shall take sufficient precautions to prevent mulch from entering drainage structures through displacement by wind, water, or other causes and shall promptly remove any blockage to drainage facilities that may occur.

G. MAINTENANCE

1. The Contractor shall keep all seeded areas in good condition, reseeding and mowing if and when necessary as directed by the Engineer, until a good lawn is established over the entire area seeded. Contractor shall maintain these areas in an approved condition until final acceptance of the Contract.

2. Grassed areas will be accepted when a ninety-five percent (95%) cover by permanent grasses is obtained and weeds are not dominant. On slopes, the Contractor shall provide against washouts by an approved method. Any washouts that occur shall be regraded and reseeded until a good sod is established.

3. Areas of damage or failure due to any cause shall be corrected by being repaired or by being completely redone as may be directed by the Engineer. Areas of damage or failure resulting either from negligence on the part of the Contractor in performing subsequent construction operations or from not taking adequate precautions to control erosion and siltation as required throughout the various Sections of the Specifications, shall be repaired by the Contractor as directed by the Engineer at no cost to the Owner.

END OF SECTION

PART 1: GENERAL

1.01 SCOPE OF WORK

This Section covers the furnishing of all labor, equipment, and materials necessary for the stabilization of channels or slopes by use of jute thatching. The jute thatching is used in the place of mulch or sod in locations shown on Drawings and in other areas where ordinary seeding methods are ineffective.

PART 2: PRODUCTS

2.01 MATERIALS

A. Lime, fertilizer, and seed shall be applied as required by Section 02931, Seeding, Fertilizing, and Mulching.

B. Seeding shall be split with half the seed applied before placing the thatching and the remaining half after the thatching is laid.

PART 3: EXECUTION

3.01 INSTALLATION

A. All rocks, clods, and sticks shall be removed from channel or slope and surface shall be smooth in order to provide contact between the soil surface and the thatching.

B. Thatching shall be laid starting at the top of the channel and unrolled downgrade. When laying in channels, one edge of the strip shall coincide with the channel center. A second strip shall be laid parallel to the first, allowing a two-inch (2″) overlap.

C. The top end shall be buried in a trench a minimum of four inches (4″) deep, backfilled and tamped. Reinforce with a row of staples, spaced ten inches (10″) apart, driven through the jute about four inches (4″) downhill from the trench. The center overlap shall be stapled three to four feet (3- 4') apart. Staple the outer edges similarly after the center has been stapled.

D. When one (1) roll of thatching ends and another roll begins, the end of the top strip shall overlap the trench where the upper end of the lower strip is buried a minimum of four inches (4") and shall be stapled securely.

E. Erosion stops shall be formed by burying the ends of both the upper and lower strips in the slit trench and stapling securely with a double row of staples. Spacing of stops shall be one hundred feet (100'-0") maximum.

F. Thatching shall be rolled at right angle after laying, stapling, and seeding are complete. Perfect contact between the thatching and the soil is vital.

G. Staples shall be hairpin-shaped wire staples, 8 gauge, eight to ten inches (8-10") in length. Wooden pegs shall not be used.

3.02 QUALITY CONTROL

Contractor shall inspect completed installation to ensure thatching is in contact with soil at all locations and that staples are secure.

PART 4: MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Measurement will be number of square yards of surface area completed and accepted.

4.02 PAYMENT

Quantities so measured will be paid for at the Contract unit price.

END OF SECTION