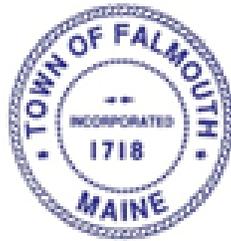


Town of Falmouth, Maine



Route One Median Islands (2016)

Contract Documents

Notice to Contractors

Project: Route One Median Island Improvements

Owner: Town of Falmouth

Information for Bidders: Proposals shall be sealed and clearly marked “*Route One Median Island Improvements*” and delivered to the office of the Falmouth Public Works Department, located at 101 Woods Road, no later than April 21, 2016, at 11:00 AM.

The project consists of approximately 2,500 linear feet of granite curbing, 64 linear feet of removal of granite curb, 15 tree wells to be constructed, removal of concrete road base, concrete encasement of curb, paving work, 16,850 square feet of landscape/hardscape island area, and other related improvements as noted on the plans.

All questions related to this *Request for Proposals* shall be directed to Jay Reynolds, Public Works Director, who can be reached at (207) 781-3919 or at jreynolds@falmouthme.org.

Pre-Bid Meeting: A non-mandatory pre-bid meeting will be held on April 14, 2016, at 11:00 AM, at the Town of Falmouth Public Works Office, 101 Woods Road.

Bid Bond: A certified check or bank draft payable to the Town of Falmouth or a satisfactory Bid Bond executed by the Bidder and a Surety company in the amount equal to five percent (5%) of the bid shall be submitted with each Bid.

Project Completion: The project must be completed within 60 calendar days from signing of the date in the Notice to Proceed.

Submissions: Late or faxed submissions will not be accepted. The Owner reserves the right to reject any or all bids, negotiate with the successful bidder for a reduced scope of work, and to waive any irregularities in the bidding process. The successful bidder will be required to furnish the necessary Performance and Payment Bonds and Insurance Certificates. Bonds shall be in the amount of 100 percent of the contract price.

Plan Availability: The contract documents may be obtained and/or viewed at the Public Works Office, 101 Woods Road, Falmouth, ME 04105.

Contract Documents may be obtained only at the Town of Falmouth Public Works Office on or after April 4, 2016.

INSTRUCTIONS TO BIDDERS

1. Defined Terms

The term “Successful Bidder” means the lowest, qualified, responsible Bidder to whom the Owner makes an award. The term “Bid Documents” included the Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents, including Addenda.

2. Copies of the Bidding Documents

- A. Complete sets of the Bidding Documents may be obtained at the Town of Falmouth, Public Works Department, 101 Woods Road, Falmouth, ME 04105.
- B. The Bidding Documents shall be used in preparing bids. The Owner shall not assume any responsibility for errors or misinterpretations resulting from use of incomplete sets of bidding Documents.

3. Qualifications of Bidders

Each Bidder must be prepared to submit within five days of the Owner’s request, written evidence, such as financial data, previous experience, present commitments, and other such data as *may* be requested by the Owner. Each bid must contain evidence of Bidder’s qualification to do business in the State of Maine prior to award of contract.

4. Examination of Contract Documents and Site

- A. It is the responsibility of the Bidder, before submitting a Bid, to:
 - 1. Examine the Contract Documents thoroughly;
 - 2. Visit the site and become familiar with local conditions that may affect cost, progress, performance, or furnishing of work;
 - 3. Consider Federal, State, and Local laws, ordinances, rules, and regulations that may affect cost, progress, performance, or furnishing of the work;
 - 4. Notify the Town Engineer of all conflicts, errors, or discrepancies in the Contract Documents.

5. Examination of Contract Documents and Site

No interpretation of the meaning of the plans, specifications, or other Contract Documents will be made to any bidder orally. Every request for such interpretation should be in writing or via email (jreynolds@falmouthme.org), addressed to Town of Falmouth, Public Works Department, 101 Woods Road, Falmouth, ME 04105, and to be given consideration, must be received at least four (4) days prior to the date fixed for the opening of bids. Any such interpretations and supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be sent via fax or email to all prospective Bidders, at the respective addresses furnished for such purposes, no later than one (2) days prior to the date fixed for the opening of Bids. Failure of any Bidder or receive any such addendum or interpretation shall not relieve any Bidder from

any obligation under their Bid as submitted. All addenda so issued shall become part of the Contract Documents.

6. Bid Security

- A. Each Bid must be accompanied by Bid Security made payable to Owner in an amount of five (5) percent of the Bidder's Bid price and in the form of a certified or bank check or Bid Bond issued by a surety.
- B. The Bid security of the successful bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the successful Bidder fails to execute the Agreement and furnish the required contract security within ten (10) days after the Notice of Award, the Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited.

7. Bid Form

- A. The Bid Form is attached hereto; additional copies may be obtained from the Owner.
- B. All blanks on the Bid Form must be completed in ink or by typewriter.
- C. Bids by corporations must be executed in the corporate name of the President or a Vice-President (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the Secretary or an Assistant Secretary. The corporate address and state of incorporation shall be shown below the signature.
- D. Bids by partnerships must be executed in the partnership name and signed *by* a general partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- E. The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which shall be filled in or on the Bid Form).
- F. The address and telephone number for communications regarding the Bid must be shown.

8. Submission of Bids

Bids shall be submitted at the time and place indicated in the Invitation to Bid and shall be included in a sealed envelope, marked with the Project Title, name and address of the Bidder, and accompanied by the Bid Security and other required documents. Bids shall only be accepted from firms who purchased plans from the Owner.

9. Modification or Withdrawal of Bids

Bids may be modified or withdrawn by an appropriate document duly executed and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

10. Opening of Bids

Bids will be opened and read aloud publicly. An abstract of the amounts of the Base Bid and Alternates (if any) will be made available to Bidders after the opening of Bids.

11. Bids to Remain Subject to Acceptance

All Bids shall remain subject to acceptance for thirty (30) days after the day of the Bid Opening, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

12. Award of Contract

- A. Owner reserves the right to accept or reject any an all Bids. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolve in favor of the correct sum.
- B. If the Contract is to be awarded, it will be awarded to the lowest bidder whose evaluation by the Owner indicates to Owner that the award will be in the best interest of the Project.
- C. If the Contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening.

13. Contract Security

The successful Bidder shall furnish a Performance Bond and a Payment Bond, each in the amount of 100% of the contract price with a corporate surety approved by the Owner.

14. Insurances

Contractors shall obtain such construction insurance as is customary and appropriate. Minimum insurances for which certificates will be required are defined in the general conditions of the contract.

15. Signing of Agreement/Notice to Proceed

When the Owner gives the Notice of Award to the successful Bidder, it will be accompanied by three unsigned copies of the Agreement and all other Contract Documents. Within ten (10) days thereafter, Contractor shall sign and deliver three copies of the Agreement to the Owner with all other Contract Documents attached. The Notice to Proceed shall be issued within ten (10) days after execution of the Agreement by Owner.

16. Traffic Regulation

All roadways shall be opened to a minimum of one-way traffic at all times during construction and shall abide by MDOT traffic regulation standards. The Contractor is responsible for providing flaggers and traffic control as needed to maintain a safe working environment.

17. Coordination with Others

Contractor shall work with and coordinate with public utilities as necessary, including power, telephone, cable TV, and water/sewer services.

18. Wage Rates

State wage rates do not apply to this project.

19. Safety and Health Regulations

This project is subject to all Safety & Health Regulations as promulgated by the U.S. Department of Labor.

20. Responsibility For Damage Claims

The Contractor and his surety shall indemnify and hold harmless the Owner, his officers and employees, from all suits, actions, or claims of any character brought because of any injuries or damage received or sustained by any person or property on account of the operations of said Contractor. The Contractor shall promptly pay all bills for labor, materials, and equipment contracted for or used by him on account of the work herein contemplated. If the monies retained under this Contract are insufficient to pay all such claims presented to Owner, the Owner may pay the same and the Contractor shall repay the Owner all sums so paid.

21. Sanitary Regulations

Sanitary convenience for use of all persons employed on the work, shall be provided and maintained at suitable locations in accordance with state and local ordinances.

22. Testing & Inspections

Contractor shall give Engineer timely notice of readiness of the Work for all required testing, inspections, or approvals and shall cooperate with testing and inspection personnel. Contractor shall employ and pay for the services of an independent testing laboratory to perform all testing and inspections required by the Contract Documents.

BIDDERS PROPOSAL

Proposal of _____ (herein called "Bidder"), organized and existing under the laws of the State of Maine and doing business as _____.

To the Town of Falmouth (hereinafter called the "Owner").

In compliance with your Advertisement for Bid, Bidder hereby proposes to perform all work for the construction of the "Route One Median Island Improvements" in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

By submission of this Bid, each Bidder certifies, and in the case of a joint Bid each party thereto certifies as to its own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid with any other Bidder or competitor.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in the 'agreement' and to fully complete the project by **June 30, 2016**. Bidder further agrees to pay as liquidated damages, the sum of \$100 for each consecutive calendar day thereafter as provided in the General Conditions

Bidder acknowledges receipt of the following addendum (if any):

Bidder agrees to perform all work described in the Contract Documents for the following unit or lump sum prices:

**Bid Schedule
Route One Median Islands (2016)**

Base Bid

Bid Item #	Description	Approx. Quantity	Units	Unit Price (Words)	Unit Price (Numerals)	Total Amount
1	Mobilization	1	Lump Sum			
2	Traffic Control	1	Lump Sum			
3	Type 5 Sloped Granite Curb (straight)	2,330	Linear Feet			
4	Type 5 to Type 1 Granite Transition Curb	12	Each			
5	Type 1 Granite 10'R Radius Tipdown Curb	12	Each			
6	Remove Existing Curb	64	Linear Feet			
7	Pavement Restoration (19.5 mm) Binder Mix	40	Ton			

Bid Item #	Description	Approx. Quantity	Units	Unit Price (Words)	Unit Price (Numerals)	Total Amount
8	Concrete Backfill (5000 psi)	57	Cubic Yard			
9	Base Gravel Type A MDOT 703 spec.	40	Cubic Yard			
10	Remove Existing Concrete Road Base	100	Square Yard			

Total Base Bid

<p>Total Amount Written in Numbers</p> <hr style="width: 60%; margin: 10px auto;"/> <p>Total Amount Written in Words</p> <hr style="width: 60%; margin: 10px auto;"/>

**Bid Schedule
Route One Median Islands (2016)**

Bid-Alternatives

Bid Alternative #	Description	Approx. Quantity	Units	Unit Price (Words)	Unit Price (Numerals)	Total Amount
1	Loam and Seed Median Islands	1	Lump Sum			
2	Install Cobble Pavers in Median Island	1	Lump Sum			
3	Install Grass Pavers with Sand, Loam and Seed, in Median Islands	1	Lump Sum			
4	Install Cobblestone edging and Loam/Seed in Median Islands	1	Lump Sum			

NOTICE OF AWARD

Description of Work: Route One Median Island Improvements, Town of Falmouth, Falmouth, Maine

This project is hereby awarded to:

The Owner has considered the Proposal submitted by your firm for the above project in response to its Notice and Instructions to Bidders dated April 2016.

It is in the best interest of the Owner to accept your proposal in the amount of:

You are hereby notified that your proposal has been accepted.

You are required by the Notice and Instructions to Bidders to execute the contract within 10 days from the date of the delivery of this Notice of Award to you.

Dated this _____ day of _____, 2016

Town of Falmouth, Owner

by: _____

Title

Acceptance of Notice

Receipt of the Notice of Award is hereby acknowledged:

This ____ day of _____, 2016

by: _____

Title

AGREEMENT

I. PARTIES

This contract (hereinafter referred to as "Agreement") is made and entered into on this _____ day of _____, 2016, by and between the Inhabitants of the Town of Falmouth with a mailing address of 271 Falmouth Road, Falmouth, Maine 04105 (hereinafter referred to as "Town"); and _____, with a mailing address of _____ (hereinafter referred to as "Contractor"). In consideration of the mutual promises contained herein, Contractor agrees to perform the following services for the Town.

II. SCOPE OF WORK

In consideration of the compensation set forth herein, the Contractor shall perform the services as outlined in the contract documents dated January 2016.

III. COMMENCEMENT AND COMPLETION

The Contractor will commence work on or before May 10, 2016 and will complete work on or before June 30, 2016.

IV. PAYMENT TERMS

The Contractor shall submit an invoice on or about the first of each month reflecting services performed at the Contractor's normal professional billing rates, attached hereto as Exhibit C. The Contractor understands that the payment for completion of the services outlined in Section II shall not exceed _____ Dollars (\$ _____), and the Contractor agrees to perform the services on that basis. Invoices shall list separately all out of pocket expenses being billed.

V. TERMINATION

Either party may terminate this Agreement for cause after giving the other party written notice and a reasonable opportunity to cure. The Town may terminate without cause by giving the Contractor fourteen (14) days notice, and compensating the Contractor equitably to the termination date.

VI. DISPUTE RESOLUTION

Any controversy or claim arising out of or related to this Agreement, which cannot be resolved between the parties shall be submitted to the Maine Superior Court (Cumberland County). This agreement shall be governed by Maine law.

VII. QUALIFICATIONS

The Contractor represents it holds, and will continue to hold during the term hereof any and all qualifications, licenses and certifications required to perform its services in Maine. The contractor shall perform all services in accordance with professional standards.

VIII. SUBCONTRACTORS

The Contractor shall be fully responsible to the Town for the acts and omissions of any subcontractors and of persons both directly or indirectly employed by it, and shall hold subcontractors to the same terms and conditions as Contractor is held under this Agreement. No subcontractors shall be retained on this Agreement without the specific prior written approval of the Town.

IX. INSURANCE

The Contractor shall purchase and maintain Workers' Compensation Insurance, General Public Liability and Property Damage Insurance including vehicle coverage and professional liability insurance, all with limits and terms satisfactory to the Town. The Town shall be named as an additional insured on the liability policy.

X. INDEMNIFICATION

The Contractor will indemnify and hold harmless the Town, its officers, agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the Agreement by the Contractor, its officials, employees, agents and subcontractors.

XI. ENTIRE AGREEMENT

This Agreement and its attachments represent and contain the entire agreement between the parties. Prior discussions or verbal representations by the parties that are not contained in this Agreement and its attachments are not a part of this Agreement. Where there is any conflict between the provisions of this Agreement and the provisions of any attachment, the provisions of this Agreement shall control.

Date: _____

By: _____

Title: _____

Date: _____

INHABITANTS OF THE
TOWN OF FALMOUTH, MAINE

By: _____
Nathan A. Poore, Town Manager

PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond:

None

See Page _____

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Company:

Signature: _____

Signature: _____

Name and Title:

Name and Title:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.
3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:
 - 3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and
 - 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and Surety have received notice as provided in Subparagraph 3.1; and
 - 3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract in accordance with the terms of the contract with the Owner.
4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or
 - 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or
 - 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or
 - 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 - 4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or
 - 4.2 Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as providing in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.
6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:
 - 6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and
 - 6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.
8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions

conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. DEFINITIONS

- 12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
- 12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.
- 12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATION TO THIS BOND ARE AS FOLLOWS:

(FOR INFORMATION ONLY - Name, Address, and Telephone)

AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect,
Engineer or other party):

PAYMENT BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address): SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond: None See Page _____

CONTRACTOR AS PRINCIPAL

SURETY

Company:

Company:

Signature: _____

Signature: _____

Name and Title:

Name and Title:

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment

furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:
 - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
 - 2.2 Defends, indemnities and holds harmless the Owner from claims, demands, liens, or suit by any person or entity whose claim, demand, lien, or suit is for the payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.
4. The Surety shall have no obligation to Claimants under this Bond until:
 - 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
 - 4.2 Claimants who do not have a direct contract with the Contractor:
 - 4.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
 - 4.2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of finishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
 - 4.3 Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.
5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.
6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

- 6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
- 6.2 Pay or arrange for payment of any undisputed amounts.
7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
- II. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.
13. When this Bond has been furnished to comply with a statutory. or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.
- 15 DEFINITIONS

- 15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials, or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
- 15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(FOR INFORMATION ONLY - Name, Address, and Telephone)

AGENT OR BROKER:

OWNER'S REPRESENTATIVE

(Architect, Engineer or other party):

Notice to Proceed

Project:

To:

Date: _____, 2016

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 2016, on or before _____, 2016, and you are to complete the WORK within ____ consecutive calendar days thereafter.

The date of completion of all WORK is therefore set at _____, 2016.

Owner

by: _____

Title

Acceptance of Notice

Receipt of the above Notice to Proceed is hereby acknowledged.

This ____ day of _____, 2016.

Contractor

by: _____

Title

SECTION 01026

Measurement and Payment

Marston and Oriole Streets Drainage System Replacement

PART 1 - GENERAL

1.01 SCOPE

Payment for various items shown on the Bid Schedule, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, materials, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of work all in accordance with the requirements of the Contract Documents, and including all costs of compliance with regulations of public agencies having jurisdiction. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs, therefore, shall be included in the prices named in the Bid Schedules for the various appurtenant items of work.

1.02 INCIDENTAL WORK

Incidental work items for which separate payment will not be made includes, but is not limited to, the following items. Consult the Section 1.03 for specific Bid Items for this project as some elements of work may have separate pay items.

1. Pre-Construction photographs.
2. Project record documents.
3. Traffic control plan and traffic regulation.
4. Signs
5. Clean-up and restoration of property.
6. Restoration of fences and other structures
7. Cooperation and coordination with other Contractors and utility companies including related inspection costs and other costs.
8. Utility crossings and relocations, unless otherwise paid for.
9. Temporary utility services to buildings, as required to maintain service during construction.
10. Minor Items--such as relocation of sign posts, guard rails, rock wall, mail boxes, curbs, traffic loop detectors, pavement markings, etc., damaged as a result of construction activities.
11. Trench boxes, steel and/or wood sheeting as required, including that left in place.
12. Maintenance of all existing sewer flows and repair of existing sewer pipes.
13. Dewatering as necessary.
14. Dust control unless otherwise specified.
15. Erosion control unless otherwise specified.
16. Quality assurance testing unless an allowance is provided as a bid item.
17. Final cleaning of new pipes and structures.
18. Clearing, grubbing and stripping unless otherwise specified.
19. Loam, seeding, grading, liming, fertilization, mulching, and watering.
20. Routine flagman services.
21. Construction schedules, bonds, insurance, shop drawings, warranties, guarantees, certifications and other submittals required by the Contract Documents.
22. Repair and replacement of culverts, underdrains, rock lined drainage trenches and other utilities damaged by construction activities and corresponding proper disposal of removed materials unless otherwise paid for.

23. Temporary construction necessary for construction sequencing and other facilities not permanently incorporated into the work.
24. Weather protection.
25. Permits not otherwise paid for or provided by the Owner.
26. Visits to the project site or elsewhere by personnel or agents of the Contractor, including manufacturer's representatives, as may be required.
27. Mobilization and demobilization, unless otherwise provided for as a Bid Item..
28. Contract administration and insurance.
29. Test pits to establish in place field soils density, groundwater conditions, or requirements for dewatering.
30. Pipe markings.
31. **Sand, Stone, borrow, tack coat, and/or other items not specifically identified as a pay item: shall be incidental to the pay items/project.**

1.03 METHOD OF MEASUREMENT AND PAYMENT

1. Mobilization-

Mobilization costs are the costs of initiating the contract, general contract administration costs, insurance's and bonds, exclusive of the cost of material. Mobilization costs shall not exceed five (5) percent of the total amount of the Bid.

Payment for mobilization shall be at the lump sum price in the Bid Schedule under Base Bid Item #1 and shall be payable in two payments: 1) when the Contractor is operational at the project site; 2) at 50% work complete. For the purposes of this item, "operational" shall be construed to mean substantial commencement of work at the site.

2. ***Rock Excavation- This Section Deleted***
3. ***Storm Sewer Piping Systems - This Section Deleted***
4. ***Precast Structures- This Section Deleted***
5. ***Box Cut Shoulders- This Section Deleted***
6. ***Tree Removal- This Section Deleted***
7. ***Driveway Preparation- This Section Deleted***
8. ***Sidewalk Construction- This Section Deleted***
9. ***Rip-Rap Culvert Outlets- This Section Deleted***
10. ***Loaming/Seeding- This Section Deleted***
11. ***Construction Signs and Maintenance, Flagging -***

Construction signs and sign maintenance and flagging shall be measured for payment as a lump sum.

Payment for signing and maintenance shall be at the contract lump sum price in the Bid Schedule under Base Bid Item #2 (Traffic Control). The lump sum price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily complete and maintain signs as shown on the Contract Drawings, detailed in the Contract Documents, or as directed by the Engineer. Satisfactory performance shall be placement of signs in accordance with the typical signing plan or as directed by the Engineer, maintenance of fixed and portable signs, as well as all other operations as may be necessary to complete the work.

Payment for flaggers shall be also be included in the contract lump sum price in the Bid Schedule under Base Bid Item #2 (Traffic Control). The unit price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily provide flaggers for the duration of the project where necessary or as directed by the Engineer. Flagging services shall be necessary when median island work is occurring and/or when the roadway is closed to one lane.

12. Dust Control -

Dust control shall be incidental to the project. The price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily reduce and control dust emissions as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered procurement of necessary dust control materials and usage of them at the project site as requested by the Engineer or the Owner.

13. Bituminous Curb- This Section Deleted

14. Bituminous Paving-

Bituminous paving shall be measured for payment by the ton delivered to the project site. Tonnage will be as calculated from slips provided by the bituminous concrete manufacturing facility delivered to the site. Pavement rejected for quality reasons or not used due to over production will be deducted from the tonnage slips.

Payment for bituminous paving shall be at the contract unit price in the Bid Schedule under Base Bid Item #8 respectively. The unit price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily complete the paving as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered fine grading of the gravel surface, including shim where necessary, hauling, placing, grading, and compacting the bituminous concrete, and all other operations as may be necessary to perform the work..

15. Roadway Reclamation – This section Deleted/Not applicable.

16. Pavement Milling/Butt Joints: Butt Joints shall be incidental to the project. The unit price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily complete the butt joints as shown on the Contract Drawings.

17. Pavement Marking- This Section Deleted

18. Removal of Existing Curb-

Curb Removal shall be measured for payment by the linear foot of sloped granite curb removed from the project site and delivered to the Owner's designated facility at 101 Woods Road. Linear footage will be field measured.

Payment for Curb Removal shall be at the contract unit price in the Bid Schedule under Base Bid Item #6 respectively. The unit price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily complete the curb removal as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered removal and delivery of the curb, hauling, placing, grading, and compacting the curb locations with base gravels, and all other operations as may be necessary to perform the work.

19. Removal of Existing CB/MH- This Section Deleted

20. Geotextile- This Section Deleted

21. Detectable Warning Device- This Section Deleted

22. Common Excavation -

Any Common Excavation shall be considered incidental to all pertinent pay items, and shall be for all labor, materials, tools, and equipment required to satisfactorily complete the excavation as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered excavation of soil to the dimensions indicated and removal of the soil from the site, as well as all other operations as may be necessary to complete the work.

23. Aggregate Subbase/Base/Shim-

Aggregate base materials shall be measured by the Cubic Yard of material placed.

Payment for Aggregate Base Gravel shall be at the contract unit price in the Bid Schedule under Base Bid Item #9.

Portland Cement Concrete Backfill material for encasement/backing of curb shall be measured by the Cubic Yard of material placed.

Payment for Portland Cement Concrete Backfill shall be at the contract unit price in the Bid Schedule under Base Bid Item #8.

All other aggregate materials shall be considered incidental to all pertinent pay items, and shall be for all labor, materials, tools, and equipment required to satisfactorily complete the placement of gravel, flowable fill, or other aggregates as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered providing and delivery of the gravel, placement, rough grading, compaction, and fine grading, as well as all other operations as may be necessary to complete the work.

24. Segmental Retaining Wall- This Section Deleted

25. New Mailboxes- This Section Deleted

26. Adjust Existing Frames to Grade- This Section Deleted

27. Test Pit- This Section Deleted

28. Concrete Road Base Removal-

Removal of the existing concrete road base shall be measured for payment by the square yard removed from the project site. Square yardage will be as calculated from field measurements of the areas identified/completed for concrete removal.

Payment for concrete road base removal shall be at the contract unit price in the Bid Schedule under Base Bid Item #10. The unit price shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily complete the concrete removal as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered removal of the concrete base, including rebar cutting and removal where necessary, hauling, disposal, and all other operations as may be necessary to perform the work.

29. Granite Curbing, New

Type 5 Sloped Granite Curbing shall be measured for payment by the linear foot.

Payment for Type 5 Sloped Granite Curbing shall be at the contract unit price in the Bid Schedule under Base Bid Item #3.

Type 5 to Type 1 Granite Transition Curbing shall be measured for payment by per-each section of curb installed.

Payment for Type 5 to Type 1 Granite Transition Curbing shall be at the contract unit price in the Bid Schedule under Base Bid Item #4.

Type 1 Granite Radial Tipdown Curbing shall be measured for payment by per-each section of curb installed.

Payment for Type 1 Granite Radial Tipdown Curbing shall be at the contract unit price in the Bid Schedule under Base Bid Item #5.

The unit prices for each type of granite curbing shall be full compensation for all labor, materials, tools, and equipment required to satisfactorily complete the curbing as shown on the Contract Drawings and detailed in the Contract Documents. Satisfactory performance shall be considered saw cutting existing pavement and removal, excavation, base placement, curbing placement and support, backfill, expansion joint fabric, and all other operations as may be necessary to perform the work.

Section 01300

Submittals

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed Products list.
- D. Shop drawings.
- E. Product data.
- F. Samples.
- G. Manufacturers' instructions.
- H. Manufacturers' certificates.
- I. Construction photographs.

1.02 RELATED SECTIONS

- A. Section 01400 - Quality Control: Manufacturers' field services and reports.
- B. Section 01700 - Contract Closeout: Contract warranty and manufacturers' certificates.

1.03 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Engineer accepted form.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Engineer review stamps.

- H. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedule in duplicate within 15 days after date of Owner-Contractor Agreement.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation identifying first work day of each week.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

1.05 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number for each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.06 SHOP DRAWINGS

- A. Submit in the form of one reproducible transparency and one opaque reproduction.
- B. After review, reproduce, and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01700 Contract Closeout.

1.07 PRODUCT DATA

- A. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Engineer.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700 Contract Closeout.

1.08 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Engineer's selection.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification Sections; one of which will be retained by Architect/Engineer.
- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.09 MANUFACTURERS' INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.10 MANUFACTURERS' CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturers' certificate to Engineer for review, in quantities specified for Product Data.
- B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

Section 01400

Quality Control

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Testing laboratory services.
- D. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

- A. Section 01090 - Reference Standards.
- B. Section 01300 - Submittals: Submission of Manufacturers' Instructions and Certificates.
- C. Section 01600 - Material and Equipment: Requirements for material and product quality.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

- A. Conform to reference standard by date of issue current on date of Contract Documents.

1.05 FIELD SAMPLES

- A. Install field samples at the site as required by individual specifications Sections for review.
- B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Engineer.

1.06 TESTING LABORATORY SERVICES

A. Owner shall employ the services of a qualified firm to perform quality control testing in the field or laboratory on concrete, moisture density relationships (Proctors) and relative density tests on embankment, fill and backfill materials, in-place field density tests on embankments and fills, and other materials and equipment, during and after their incorporation in the work. Field sampling and testing shall be performed by the testing firm with minimum interference with construction operations. Engineer shall determine the time and location of field sampling and testing as necessary to determine that materials and equipment conform with the Contract Documents.

B. Contractor shall furnish all sample materials and cooperate in the sampling and field testing activities. Contractor will furnish personnel, equipment, and facilities to perform sampling and field-testing activities and to deliver samples and test specimens to the testing laboratory.

C. If tests indicate work does not meet specified requirements, remove work, replace, and retest at no cost to Owner.

D. Contractor will be given an allowance to pay for the services of the testing firm. Should the final cost as determined from the testing firm invoices received, vary upward or downward from the stated allowance, an adjustment will be made accordingly.

E. Contractor shall be responsible for all sample gathering and testing laboratory services in connection with concrete and asphalt mix designs, field cores, pipe and appurtenances testing, manhole testing, and topsoil analysis testing.

1.07 MANUFACTURERS' FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Engineer 30 days in advance of required observations. Observer subject to approval of Engineer.

B. When specified in individual specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

Section 01500

Construction Facilities and Temporary Controls

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, telephone service, and sanitary facilities.
- B. Temporary Controls: Barriers, protection of the Work.
- C. Construction Facilities: Access roads, parking, progress cleaning.

1.02 RELATED SECTIONS

- A. Section 01560 - Temporary Controls.
- B. Section 01700 - Contract Close-out: Final cleaning.

1.03 TEMPORARY ELECTRICITY

- A. Provide and pay for power service required from Utility source.

1.04 TEMPORARY LIGHTING

- A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 watt/sq. ft.

1.05 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures.
- B. At end of construction, return facilities to same or better condition than originally found.

1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
- B. Provide protection for plant life designated to remain. Replace damaged plant life.
- C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.07 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual specification Sections.
- B. Provide temporary and removable protection for installed Products. Control activity in immediate work area to minimize damage.

- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.08 SECURITY

- A. Provide security and facilities to protect work from unauthorized entry, vandalism, or theft.

1.09 ACCESS ROADS

- A. Construct and maintain temporary roads accessing public thoroughfares to serve construction area.
- B. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.

1.10 PARKING

- A. Provide temporary parking areas to accommodate construction personnel.
- B. When site space is not adequate, provide additional off-site parking.

1.11 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- C. Remove waste materials, debris, and rubbish from site weekly and dispose off-site.

Section 01505

Mobilization

PART 1 - GENERAL

1.01 GENERAL

A. Mobilization shall include the obtaining of all permits, insurance, and bonds; moving onto the site of all plant and equipment; furnishing and erecting plants, temporary buildings, and other construction facilities; all as required for the proper performance and completion of the Work. Mobilization shall include but not be limited to the following principal items and shall not exceed five (5) percent of the lump sum bid prices:

1. Moving on to the site of all Contractor's plant and equipment required for first month operations.
2. Installing temporary construction power, wiring, and lighting facilities as required.
3. Developing construction water supply as deemed necessary by the contractor or the project.
4. Providing field office trailers (if desired by Contractor for their own use ~~or requested by Engineer for Engineer's use~~), ~~complete with all specified furnishings and utility services including telephones, telephone appurtenances, and copying machine.~~
5. Providing all on-site communication facilities, including telephones, for contractors use.
6. Providing on-site sanitary facilities and potable water facilities as needed
7. Arranging for an erection of Contractor's work and storage yard.
8. Submittal of all required insurance certificates and bonds.
9. Obtaining all required permits.
10. Posting all OSHA required notices and establishment of safety programs.
11. Having the Contractor's superintendent at the job site full time.
12. Submittal of Preliminary Construction Schedule.
13. Submittal of Schedule of Values.

1.02 PAYMENT FOR MOBILIZATION

A. The Contractor's attention is directed to the condition that no payment for mobilization, or any part thereof will be approved for payment under the contract until all mobilization items listed above have been completed as specified.

Section 01560

Temporary Controls

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water Control.
- B. Dust Control.
- C. Erosion and Sediment Control.
- D. Pollution Control.

1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work.
- B. Section 01039 - Coordination and Meetings Project coordination.

1.03 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.04 DUST CONTROL

- A. Execute Work by methods to minimize raising dust from construction operations.
- B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

1.05 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation. Adhere to the manual Stormwater Management for Maine: Best Management Practices as published by the Maine Department of Environmental Protection.
- B. Minimize amount of bare soil exposed at one time.
- C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
- D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.06 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

Section 01570

Traffic Control and Signage

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Regulate traffic when working within right-of way.
- B. Perform work in a manner to provide safe passage for the public at all times with a minimum of obstruction to traffic.
- C. The local police department, fire department, MDOT, and the Engineer will determine if safe passage is being maintained. Perform additional work required by them to maintain safe passage.
- D. Provide all signs, barricades, flags, traffic guards, and warning devices.
- E. Provide access for residents and abutting land owners along the project to driveways and other normal outlets from their property.

PART 2 - PRODUCTS

2.01 SIGNS, BARRICADES, AND WARNING DEVICES

- A. General: Comply with requirements in "Manual on Uniform Traffic Control Devices" published by Dept. of Transportation, Federal Highway Administration and requirements of Maine Dept. of Transportation, latest edition.

PART 3 - EXECUTION

3.01 MAINTENANCE OF TRAFFIC

- A. General: Roadways may open to local traffic only with approval of the Owner and 24 hours notice to local police and fire departments. Detour signs are required.
- B. School buses shall be accommodated during the morning and afternoon pick-up times so that they are not detained. Emergency vehicles have the right-of-way at any time and shall be accommodated.

3.02 DETOURS:

- A. At the discretion of the Owner and with 24 hour notice to the Police and Fire Departments. Alternative Route signs are recommended, though not required.

3.03 SCHEDULING OF WORK:

- A. Schedule all work to minimize disruptions and to allow access to all buildings.
- B. Revise the plan of work if, in the opinion of the Engineer, Owner, or other regulatory agency, it will create traffic hazard or an unreasonably long delay.

3.04 SIGNS, BARRICADES, AND WARNING DEVICES

- A. General: The contractor shall erect appropriate signs to warn traffic of construction zone and/or detours. Placement of necessary signs shall be at the discretion of the Engineer/Owner and shall be done so without added cost to the Owner.
- B. Provide adequate warning signs, barricades, signal lights, and take other necessary precautions for the safety of the public.
- C. Provide and illuminate suitable warning signs to show where construction, barricades, or detours exist.
- D. Signal lights: Illuminate at all barricades and obstructions from sunset to sunrise.
- E. Maintain necessary signs, and signs required by the Maine D.O.T., barricades, lights, and other safety precautions during authorized suspension of the work, week-ends, holidays, or other times when construction work is not in progress.

3.05 EXISTING SIGNS

- A. Temporarily Reset and maintain street directory and regulatory signs which must be moved during construction. Relocate signs so that no traffic hazards are created. This work is incidental to the contract.
- B. Permanently reset signs at designated locations prior to completion of work. This work is incidental to the contract.
- C. Temporarily Reset and maintain mailboxes which must be moved during construction. Relocate boxes so that no traffic hazards are created. This work is incidental to the contract.
- D. Permanently reset boxes at locations specified by the Engineer and in accordance with U.S. Postal Service requirements prior to completion of work. This work is incidental to the contract.

Section 01600

Material and Equipment

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1.02 RELATED SECTIONS

- A. Section 01400 - Quality Control: Product quality monitoring.

1.03 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

1.04 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturers' instructions.
- B. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturers' instructions, with seals and labels intact and legible. Store sensitive Products in weather tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground.
- C. Provide off-site storage and protection when site does not permit onsite storage or protection.
- D. Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.
- E. Store loose granular materials on solid flat surfaces in a well-drained area. Avoid mixing with foreign matter.

F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are undamaged and are maintained under specified conditions.

1.06 PRODUCT OPTIONS

A. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

1.07 SUBSTITUTIONS

A. Engineer will consider requests for Substitutions only within 15 days after date established in Notice to Proceed.

B. Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

D. A request constitutes a representation that the Contractor:

1. Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

2. Will provide the same warranty for the Substitution as for the specified Product.

3. Will coordinate installation and make changes to other Work which *may* be required for the Work to be complete with no additional cost to Owner.

4. Waives claims for additional costs or time extension which may subsequently become apparent.

E. Substitutions **will** not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:

1. Submit three copies of request for Substitution for consideration. Limit each request to one proposed Substitution.

2. Submit shop drawings, Product data, and certified test results attesting to the proposed Product equivalence.

3. The Engineer will notify Contractor, in writing, of decision to accept or reject request.

Section 01700

Contract Close-out

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Close-out Procedures.
- B. Final Cleaning.
- C. Adjusting.
- D. Project Record Documents.
- E. operation and Maintenance Data.
- F. Warranties.
- G. Spare Parts and Maintenance Materials.

1.02 RELATED SECTIONS

- A. Section 01500 - Construction Facilities and Temporary Controls: Progress cleaning.

1.03 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.04 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.05 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.06 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of the following record documents; record actual revisions to the Work:

1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other Modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.

B. Store Record Documents separate from documents used for construction.

C. Record information concurrent with construction progress.

D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:

1. Manufacturers' name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and Modifications.

E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finish main floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract Drawings.
- F. Delete Engineer title block seal from all documents.

G. Submit documents to Engineer with claim for final Application for Payment.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit two sets prior to final inspection, bound in 8-1/2 x 11 inch text pages, three D side ring binders with durable plastic covers.

B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.

C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, type on 24 pound white paper.

E. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.

F. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

1. Significant design criteria.
2. List of equipment.
3. Parts list for each component.
4. Operating instructions.
5. Maintenance instructions for equipment and systems.
6. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.

G. Part 3: Project documents and certificates, including the following:

1. Shop drawings and product data.
2. Air and water balance reports.
3. Certificates.
4. Photocopies of warranties and bonds.

H. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection, with Engineer comments. Revise content of documents as required prior to final submittal.

I. Submit final volumes revised, within ten days after final inspection.

1.08 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.09 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

1.10 EDA CLOSE-OUT REQUIREMENTS

- A. Provide signed "Final Acceptance Report" as enclosed in the Contract Documents or as provided.

Section 02110

Site Clearing

SECTION - DELETED

Section 02150
Shoring and Bracing

PART I - GENERAL

1.01 DESCRIPTION OF WORK

A. Work included:

1. Shoring and bracing necessary to protect existing buildings, utilities, and other improvements and excavation against caving; and to meet OSHA safety requirements of shoring and bracing. Shoring and bracing to provide cofferdams.

2. Removal of bracing, as required.

B. Shoring and bracing, systems include, but are not limited to, the following:

Steel sheet piling
Movable box

C. Steel sheet piling: Provide steel sheet piling, to be removed following completion of Work, where shown on the drawings or where directed by the Engineer. Payment will be incidental to installation of piping, manholes and pump stations. Piling is to remain in place when directed by the Engineer. Payment for piling to remain in place will be made by change order.

Steel sheet piling may be left in place at the Contractor's option if approved by the Engineer. No additional payment will be made for this piling.

No payment will be made for steel sheet piling used for the Contractor's convenience.

D. Movable box: Provide where a shoring system is required but sheet piling is not called for. Cost of movable box system is incidental to other work items.

E. Earthwork: Section 02200

1.02 QUALITY ASSURANCE

A. Design: Assign design of shoring and bracing to a registered Professional Engineer.

B. Regulations: Comply with local codes and OSHA requirements.

1.03 SUBMITTALS:

A. Design Documents: Submit design calculations and drawings for shoring and bracing system and other data prepared and sealed by a registered Professional Engineer, prior to commencing work on any built in place shoring and bracing system.

1.04 JOB CONDITIONS

A. Before starting work, check and verify governing dimensions and elevations. Survey the condition of adjoining properties with Engineer. Take photographs, recording any prior settlement or cracking of structures, pavements and other improvements. Prepare a list of such damages, verified by dated photographs, and signed by Contractor, Engineer and others conducting the investigation.

B. Survey adjacent structure and improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations sufficiently distant so as not to be affected by excavation operations.

C. During excavation, re-survey benchmarks weekly. Maintain accurate log of surveyed elevations for comparison with original elevations. Notify Engineer if changes in elevations occur or if cracks, sags or other damage is evident.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. General: Provide suitable shoring and bracing materials which will support loads imposed. Materials need not be new, but should be in serviceable condition.

B. Steel sheet piling and shapes (comers, etc.): Continuous interlocking type; section modules and type of section as required by design.

C. Bracing members: Wood timbers or A36 steel members.

D. Bolts: ASTM A307.

PART 3 - EXECUTION

3.01 GENERAL

A. Provide system to resist earth and hydrostatic pressures, including surcharges from surface loads.

B. Locate shoring and bracing to clear permanent construction and to permit forming and finishing of concrete.

C. Maintain shoring and bracing while excavation is open.

D. Removal of systems: Remove systems in stages to prevent disturbance of soils and damage to structures and improvements. Fill voids as soon as sheeting is withdrawn.

3.02 STEEL SHEET PILING AND BRACING

A. Drive sheet piling prior to excavation where possible. Fill and compact voids outside sheeting to hold sides of excavation in place.

- B. Brace as required to prevent distortion of piling and other bracing members. If necessary to move a brace, install new bracing prior to removal of original brace.
- C. Cut off sheet piling to be left in place at least two feet below finish grade.

Section 02202
Rock Excavation

Section – Deleted

Section 02211
Rough Grading

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Remove topsoil and stockpile for later reuse. Remove excess from site.
- B. Excavate subsoil and stockpile for later reuse.
- C. Grade and rough contour site.

1.02 RELATED WORK

- A. Section 02202 - Rock Removal.
- B. Section 02218 - Landscape Grading.
- C. Section 02222 - Excavation.
- D. Section 02223 - Backfilling.

1.03 PROJECT RECORD DOCUMENTS

- A. Submit documents under provisions of Section 01700.
- B. Accurately record location of utilities remaining, rerouted utilities, new utilities by horizontal dimensions, elevations or inverts, and slope gradients.

1.04 PROTECTION

- A. Protect trees, shrubs, lawns, and other features remaining as portion of final landscaping.
- B. Protect bench marks, existing structures, fences, roads, sidewalk, and paving, and curbs.
- C. Protect above or below grade utilities which are to remain.
- D. Repair damage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Topsoil: Excavated material, graded free of roots, rocks larger than one inch, subsoil, debris, and large weeds.
- B. Subsoil: Excavated material, graded free of lumps larger than 6 inches, rocks larger than 3 inches, and debris.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Identify known below grade utilities. Stake and flag locations.
- C. Identify and flag above grade utilities.
- D. Maintain and protect existing utilities remaining which pass through work area.
- E. Notify utility company to remove and relocate utilities.
- F. Upon discovery of unknown utility or concealed conditions, discontinue affected work; notify Engineer.

3.02 TOPSOIL EXCAVATION

- A. Excavate topsoil from areas to be further excavated, re-landscaped, or regraded and stockpile in area designated on site. Remove excess topsoil not being reused from site.
- B. Do not excavate wet topsoil.
- C. Stockpile topsoil to depth not exceeding 8 feet. Cover to protect from erosion or install erosion control fencing, immediately from stockpile area.

3.03 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be re-landscaped or regraded marked areas and stockpile in area designated on site. Remove excess subsoil not being reused from site.
- B. Do not excavate wet subsoil.

Section 02218

Landscape Grading

SECTION – DELETED

Section 02222

Excavation

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Excavation for building foundations.
- B. Excavation for slabs-on-grade, paving, and landscaping.
- C. Excavation for site structures.

1.02 RELATED SECTIONS

- A. Section 01400 - Quality Control.
- B. Section 02202 - Rock removal.
- C. Section 02150 - Shoring and Bracing
- D. Section 02211 - Rough Grading
- E. Section 02223 - Backfilling.

1.03 FIELD MEASUREMENTS

- A. Verify that survey benchmark and intended elevations for the Work are as indicated.

1.04 JOB CONDITIONS

- A. Erect sheeting, shoring, and bracing as necessary for protection of persons, improvements, and excavations in accordance with OSHA safety requirements and Section 02150 of these specifications.
- B. Provide de-watering and drainage as required to accomplish work of this section.
- C. Protect new construction, existing structures, existing utilities, plants, trees, etc. at all times. Report any damages immediately to Engineer and proper authorities.
- D. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that OWNER will not be responsible for interpretations or conclusions drawn therefrom by the CONTRACTOR. Data is made available for the convenience of the CONTRACTOR.

Additional test borings and other exploratory operations may be made by the CONTRACTOR at no cost to the OWNER.

PART 2 - EXECUTION

2.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.

2.02 EXCAVATION

- A. Underpin adjacent structures which may be damaged by excavation work, including utilities and pipe chases.
- B. Excavate subsoil required to accommodate building foundations, slabs on-grade, paving, and site structures to within a tolerance of 0.1'.
- C. Machine slope banks to angle of repose or less, until shored.
- D. Excavation cut not to interfere with normal 45 degree bearing splay of foundation.
- E. Excavate all materials regardless of nature to elevations and dimensions indicated plus sufficient space for forming, shoring, draining, inspecting, etc. Excavate using open cut method unless otherwise indicated or permitted.
- F. Grade top perimeter of excavation to prevent surface water from draining into excavation.
- G. Hand trim excavation. Remove loose matter. Take care not to disturb the bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to require lines and grades to leave a solid base to receive other Work.
- H. Allow Engineer to inspect bottom of excavation for suitability of base material.
- I. Remove unsuitable base material to a depth of at least 12 inches below any pipe or structure or to a depth directed by the Engineer and replace with compacted screened gravel or crushed stone or provide proper base as otherwise directed by Engineer. Place no footing, wall, structure, pipe, etc. on unsuitable material.
- J. Place no structure, pipe, etc. partially on earth and partially on rock. Remove rock and replace with compacted screened gravel or crushed stone.
- K. Protect excavation bottoms from frost and weathering. Place no structure, pipe, etc. on frozen or weathered ground.
- L. Remove lumped subsoil, boulders, and rock up to 2 cu yd. measured by volume. Larger material will be removed under provisions of Section 02202.
- M. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.
- N. Notify Engineer of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

- 0. Correct unauthorized excavation at no extra cost to Owner.
- P. Stockpile excavated material in area designated on site and remove excess material not being reused, from site. Remove excavated material from site.
- Q. Do not perform rock excavation or excavation of unsuitable materials until material to be excavated has been cross-sectioned and classified by Engineer.
- R. Excavation in paved areas. Cut pavement prior to excavation to provide a clean, uniform edge. Minimize disturbance of remaining paved surfaces. Cut and remove the minimum amount of pavement required to complete the Work. Utilize shoring and/or bracing where sides of excavation will not stand without undermining pavement.
- S. Unauthorized Excavation. Removal of materials beyond indicated in the Contract Documents is prohibited without consent of Engineer. Unauthorized excavation, as well as remedial Work directed by Engineer including refilling, is at Contractor's expense. Refilling unauthorized excavation shall be done with crushed stone or compacted screened gravel.

2.03 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01400.
- B. Provide for visual inspection of bearing surfaces.

2.04 PROTECTION

- A. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation, from freezing.

Section 02223

Backfilling

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Building perimeter and site structure backfilling to subgrade.
- B. Site filling and backfilling.
- C. Fill under slabs-on-grade and paving.
- D. Consolidation and compaction.
- E. Fill for over excavation.

1.02 RELATED SECTION

- A. Section 01400 - Quality Control.
- B. Section 02218 - Landscape Grading to finish grade elevation.
- C. Section 02222 - Excavation.
- D. Section 02225 - Trenching.
- E. Section 03300 - Cast-in-Place Concrete.

1.03 REFERENCES

- A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ANSI/ASTM D698 - Test Method for Moisture Density Relations of Soils and Soil Aggregate Mixtures, Using 5 lb. Hammer and 12 inch Drop.
- C. ANSI/ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.
- D. ASTM D2922 - Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. ASTM D2487-69 - Classification of Soils for Engineering Purposes.

PART 2 - PRODUCTS

2.01 SUITABLE FILL AND BACKFILL MATERIAL REQUIREMENT

- A. General: Fill, backfill, and embankment materials shall be suitable selected or processed clean, fine earth, rock or sand, free from grass, roots, brush, or other vegetation.

B. Fill and backfill to be placed within 6 inches of any structure or pipe shall be free of rocks or unbroken masses of earth materials having a maximum dimension no larger than 3 inches for structures and 1 inch for tape coated pipe or PVC pipe.

C. Suitable Materials: Soils not classified as unsuitable as defined in paragraph entitled, "Unsuitable Material" herein, are defined as suitable material and may be used in fills, backfilling, and embankment construction subject to approval by Engineer.

D. Suitable materials may be obtained from on-site excavations, may be processed on-site materials, or may be imported. If imported materials are required to meet the requirements of the section or to meet the quantity requirements of the project, the Contractor shall provide the imported materials at no additional expense to the Owner, unless a unit price item is included for imported materials in the bidding schedule.

E. The following types of suitable materials are designated and defined as follows:

1. COMMON BORROW

Common borrow shall consist of earth suitable for fill or embankment construction. It shall meet the following criteria:

Sieve Size	Weight Passing
3"	100
No. 40	0-25
No. 200	0-5

2. GRAVEL BORROW (Bank Run Gravel)

Gravel borrow shall consist of granular material with uniform gradation and shall meet the following criteria:

Sieve Size	Weight Passing
6"	100
1/4"	25-70
No.40	0-30
No. 200	0-5

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3. SCREENED GRAVEL

Screened gravel shall consist of clean hard durable particles free from clay lumps, vegetated matter, and other deleterious substances and meeting the following criteria:

Sieve Size	Weight Passing
2"	100
1/2"	30-55
No.40	0-20
No. 200	0-5

4. CRUSHED STONE

Crushed stone shall be durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or smattered natural rock and reasonably free from thin, flat, elongated, or other objectionable pieces. The crushed stone shall be reasonably free from sand, clay, loam, chemical decay, or deleterious materials and not more than one percent of material passing a No. 200 sieve will be allowed to adhere to the crushed stone. The crushed stone shall be uniformly blended according to the grading requirements listed in the following tables:

1 1/2" Crushed Stone:

Sieve Size	Weight Passing
2"	100
1 1/2"	95-100
1"	35-70
3/4"	0-25

3/4" inch crushed stone:

Sieve Size	Weight Passing
1"	100
3/4"	95-100
1/2"	35-70
3/8"	0-25

5. SAND

Sand shall be well graded coarse sand without excessive fines and free from loam, clay, and organic matter. Beach sand shall not be used. The grading requirements are as follows:

Sieve Size	Weight Passing
3/8"	100
No. 4	95-100
No. 16	50-85
No. 50	10-30
No. 100	2-10

6. AGGREGATE BASE

Aggregate Base shall be screened or crushed gravel consisting of hard durable particles which are free from vegetable matter, lumps or balls of clay, and other deleterious substances. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements of the following table and in accordance with MDOT Type A material:

Crushed Base (MDOT Type A)

Sieve Size	Weight Passing
1/2"	45-70
1/4"	30-55

No. 4	0-20
No. 200	0-5

Screened Base (MDOT Type B)

Sieve Size	Weight Passing
1/2"	35-70
1/4"	25-60
No. 4	0-25
No. 200	0-5

Screened gravel base shall not contain particles of rock which will not pass the 4 inch square mesh sieve. Crushed gravel base shall not contain particles of rock which will not pass the 2 inch square mesh sieve.

Gradation tests shall conform to AASHTO method T-27 except that the material may be separated on the 1 inch sieve.

7. AGGREGATE SUBBASE

MDOT Type D Aggregate Subbase shall be sand or gravel consisting of hard durable particles which are free from vegetable matter, lumps, or balls of clay, and other deleterious substances. The gradation of the portion which **will** pass a 3 inch sieve shall meet the grading requirements of the following table:

Sieve Size	Weight Passing
3"	100
1/4"	25-70
No. 40	0-30
No. 200	0-7

Granular subbase and gravel subbase shall not contain particles of rock which will not pass the 6 inch square mesh sieve.

Gradation tests shall conform to AASHTO Method T-27 except that the material may be separated on the 4 inch sieve.

8. REFILL MATERIAL

Refill Material for replacement of unsuitable material or rock excavation below grade shall be clean screened gravel or crushed stone of 3/4 inch maximum size, free from silt, loam, and clay.

9. GRANULAR FILL

Granular Fill shall consist of mineral soil substantially free from clay, organic materials, loam, wood, trash, or other objectionable materials which may be compressible or which cannot be properly compacted. It shall not contain similar materials larger than 10 inches in largest dimension. It shall have physical properties such that it can be readily spread and compacted. It shall not contain any snow, ice, or frozen soil.

10. BEDDING MATERIAL

Where any of the above material is to be used for bedding materials, it shall further meet the following additional criteria:

Bedding material shall be so graded that 100% will pass a one (1) inch screen and not more than 10% will pass a 200-mesh sieve. Gradation test results of the bedding material shall be submitted to the Engineer for approval. In the event abnormally unstable or wet conditions are encountered, bedding material shall be crushed stone, if directed by the Engineer.

11. UNDERDRAIN BACKFILL MATERIAL

Granular material for underdrain Type B shall be free from organic matter and shall conform to the following gradation:

Sieve Size	Weight Passing
1"	95-100
1/2"	75-100
No. 4	50-100
No. 20	15-80
No. 50	0-15
No. 200	0-5

Granular material for underdrain Type C shall be free from organic matter and shall conform to the following gradation:

Sieve Size	Weight Passing
1"	100
3/4"	90-100
3/8"	0-75
No. 4	0-25
No. 10	0-5

2.02 UNSUITABLE MATERIAL

A. Unsuitable soils for fill and backfill material shall include soils which, when classified under the standard method for "Classification of Soils for Engineering Purposes", ASTM D2487, fall in the classifications of Pt, OH, CH, MH, or OL.

B. In addition, any soil containing organic matter, having a plastic limit of less than 8 percent when tested in accordance with the requirements of ASTM D4313 and containing more than 25 percent of material, by weight, passing the No. 200 sieve when analyzed according to the requirements of ANSI/ASTM D1140, or any soil which cannot be compacted sufficiently to achieve the percentage of maximum density specified for the intended use, shall be classed as unsuitable material.

PART 3 - EXCAVATION

3.01 EXAMINATION

A. Verify fill materials to be reused are acceptable.

3.02 PREPARATION

- A. Scarify and re-compact subgrade to density required for subsequent backfill materials.
- B. Cut out soft areas of subgrade not capable of insitu compaction as directed by Engineer. Backfill with an approved granular material and compact to a density equal to or greater than requirements for subsequent backfill material.
- C. Prior to placement of aggregate base course material at paved areas, compact subsoil to 95 percent of its maximum dry density in accordance with ANSI/ASTM D698.

3.03 BACKFILLING

- A. Use suitable materials from excavations which conform to the requirements herein or are approved by the Engineer for backfill up to rough grade lines except where these specifications have more stringent or special requirements for certain parts of the contract work. Supply extra fill if there is not enough fill to complete the project.

Use no material from any excavation as backfill unless approved by the Engineer.

- B. Material within two feet of finished grade in any areas to be paved or within five feet horizontally of any structure shall contain no stone having any dimension exceeding six inches. Excess and unsuitable excavated materials shall be removed from the site and satisfactorily disposed of. In the event sufficient suitable excavated material is not available for backfill, supply a granular backfill.
- C. Place materials in layers of thickness specified herein but in no case greater than 12 inches before compaction. Wet backfill when necessary, uniformly to obtain required density. Compact each layer with vibratory or sheepsfoot compactors (as appropriate) before placing next layer.
- D. In cross-country runs, trenches shall be backfilled and mounded six inches above surrounding grade in addition to the normal compaction procedure.
- E. In street work, backfill above the pipe bedding to a depth of 18 inches below finish grade will be placed in maximum 12 inch layers and then compacted. Backfill in the remaining 18 inches will be placed in 6 inch layers of base or subbase as specified and then compacted.
- F. In backfilling around structures, place material in 8 inch layers and then compact. Allow no heavy machinery within 5 feet of structure during placement. Place no material until structure can withstand the load. Bring backfill up evenly on all dies of the structure.
- G. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.
- H. Maintain moisture content within 2 percent, plus or minus, of optimum moisture content of backfill materials to attain required compaction density.

3.04 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01400.
- B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698 and with Section 01400.

C. Compaction testing will be performed in accordance with ANSI/ASTM D698 and with Section 01400.

D. If tests indicate Work does not meet specified requirements, remove Work, replace and retest all at no cost to Owner.

E. Frequency of Tests: Compaction Tests:

Trench - 1 test every 300 feet, varying lifts

Manholes, Structures - 2 tests, varying lifts.

Roads - 1 test every 100 feet, varying lifts

F. Proof roll compacted fill surfaces under paving.

G. Minimum densities following compaction shall be as follows:

Fill and Backfill Location	Standard Proctor Density (%)
Top Two Feet Under Pavement	95
Under Pavements Below Top Two Feet	90
Trenches Through Unpaved Areas	90
Embankments	90
Pipe Bedding and Trenching	95
Under Structural Foundations and Slabs	95
Beside Structure Walls, Tank Walls, Retaining Walls	90

H. Compaction shall be accomplished by appropriate methods, i.e., vibratory compaction of granular materials, sheeps-foot compaction of cohesive materials, etc. In no case shall trench compaction be deemed adequate with the use of a non compactive device such as a bulldozer. The Engineer may withhold 5 percent of the monthly requisition if in his opinion proper compaction was not met. Improper compacted materials shall be removed, replaced, or recompacted at no additional cost to the Owner.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 01500.

B. Where completed compacted areas are disturbed by subsequent construction activities or adverse weather, scarify the surface, re-shape, and compact to required density prior to further construction.

3.06 REMOVAL OF EXCESS MATERIALS

A. Remove excess material, except surplus loam, and dispose of it off Owner's property unless otherwise directed by Engineer and required by Owner.

Grade material to the satisfaction of the Owner of the property on which the material is deposited. Keep roads free of debris by sweeping or other suitable methodology. Use suitable watertight vehicles for hauling wet materials over roads and streets. Clean up materials dropped from or spread by vehicles promptly or when directed by Engineer or Owner's representative.

Section 02225

Trenching

PART 1 - GENERAL

1.01 SECTION INCLUDES

1.02 RELATED SECTIONS

A. Furnish all labor, materials, equipment and incidentals necessary to perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material and restoration of trench surfaces and easements.

B. Excavation shall extend to the width and depth shown on the Drawings or as specified and shall provide suitable room for installing pipe, structures and appurtenances.

C. Furnish and place all sheeting, bracing and supports and shall remove from the excavation all materials which the Contracting Officer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, deposit gravel for pipe bedding, or gravel refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of open trench shall be related closely to the rate of pipe laying. All excavation shall be made in open trenches.

D. All excavation, trenching and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.

E. Wherever the requirement for 92 percent compaction is referred to herein it shall mean "at least 92 percent of maximum density as determined by ASTM D1557, Method C".

F. Prior to the start of work submit the proposed method of backfilling and compaction to the Engineer for review.

A. Section 01400- Quality Control.

B. Section 02202 - Rock removal.

C. Section 02211 - Rough Grading.

D. Section 02222 - Excavation: General building excavation

E. Section 02223 - Backfilling: General backfilling.

F. Section 03300 - Cast-in-Place Concrete: Concrete materials.

1.03 REFERENCES

A. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5 lb. Hammer and 12 inch Drop.

C. ANSI/ASTM D1556 -Test Method for Density of Soil in Place by the Sand-Cone Method.

1.04 FIELD MEASUREMENTS

A. Verify that survey benchmark and intended elevations for the Work are as shown on Drawings.

PART 2 - PRODUCTS

2.01 FILL BEDDING MATERIALS

A. Materials as specified in Section 02223.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify bedding and backfill materials to be reused, are acceptable and obtain Engineers approval.]
- B. Trench excavation shall include material of every description and whatever substance encountered, except rock and boulders. Pavement shall be cut with a saw, wheel or pneumatic chisel along straight lines prior to excavation. **DO NOT USE REMOVED PAVEMENT AS FILL.** The use of a wheel cutter attachment for a bucket loader in cold weather is not allowed.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.
- B. Protect above and below grade utilities which are to remain.
- C. Strip and stockpile topsoil from grassed areas crossed by trenches. At the Contractor's option, topsoil may be otherwise disposed of and replaced, when required, with approved topsoil of equal quality. Surplus materials should be disposed of off site at Contractors expense.
- D. Cut out soft areas of subgrade not capable of insitu compaction as directed by Engineer. Backfill with refill material per Section 02223 and compact to density equal to or greater than requirements for subsequent backfill material.

3.03 EXCAVATION

- A. Excavate subsoil required for utilities being installed.
- B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.
- C. Excavation shall not interfere with normal 45 degree bearing splay of foundations.
- D. Hand trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

- E. Remove lumped subsoil, boulders, and rock up to 2 cu yd., measured by volume. Larger material will be removed under Section 02202.
- F. Correct unauthorized excavation at no cost to Owner.
- G. Correct areas over-excavated by error in accordance with Section 02222 at no additional cost to Owner.
- H. Stockpile excavated material in area designated on site and remove excess material not being used, from site. Remove excavated material from site.
- I. While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected as provided in the General Conditions and General Requirements.
- J. Trenches shall be excavated to the depth indicated on the Drawings and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Engineer. Trench width shall be practical minimum.
- K. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of subgrade soils. The trench may be excavated by machinery to, or just below the designated subgrade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Subgrade soils which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by screened gravel fill as required by the Engineer at the Contractor's expense.
- L. Clay and organic silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use a smooth-edge bucket to excavate the last one foot of depth
- M. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with a 6-in layer of coarse sand, or a mixture graded from coarse sand to the fine peastone, as approved by the Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be approved by the Engineer prior to placement. Screened gravel shall then be placed in 6-in. layers thoroughly compacted up to the normal grade of the pipe.
- N. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N, Supac equivalent, or equal.
- O. Where pipe is to be laid in screened gravel bedding, the trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.

3.4 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank or obstructing free access to fire hydrants and gate valves. Inconvenience to traffic and abutters shall be avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.

- B. It is expressly understood that no excavated material shall be removed from the site of work or disposed of, except as directed by the Engineer. When removal of surplus materials has been approved by the Engineer, dispose of such surplus material in approved designated areas. Disposal of surplus materials will be at the Contractor's expense.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at another location. When required, it shall be re-handled and used as backfill in the trench at no additional cost to the Owner.

3.5 EXCAVATION BELOW GRADE AND REFILL

- A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.
- B. If the Contractor excavates below grade through error or for the Contractor's own convenience, or through failure to properly dewater the trench, or disturbs the subgrade before dewatering is sufficiently complete, he may be directed by the Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be performed at his own expense.
- C. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the subgrade material shall be removed to the extent directed and the excavation refilled with a 6-in layer of a mixture of coarse sand to fine peastone, as approved by the Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe.

The composition and gradation of gravel shall be approved by the Engineer prior to placement. Screened gravel shall then be placed in 6-in. layers thoroughly compacted up to the normal grade of the pipe.

- D. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N, Supac equivalent, or equal.

3.6 BACKFILLING

- A. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter be prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, shall be placed up to 1-ft over the pipe
- B. An impervious dam or bulkhead cutoff of clay or other impervious material shall be constructed in the trench as directed, to interrupt the unnatural flow of groundwater after construction is completed. The dam shall be effectively keyed into the trench bottom and sidewalls. Provide at least one clay or other impervious material dam in the pipe bedding between each manhole where directed or every 300 feet, whichever is less.
- C. Where the pipes are laid cross country, the remainder of the trench shall be filled with common fill material in layers not to exceed 3-ft and mounded 6-in above the existing grade or as directed. Where a loam or gravel surface exists prior to cross country excavations, it shall be removed, conserved and replaced to the full original depth as part of the work under the pipe items. In some areas it may be necessary to remove excess material during the clean-up process, so that the ground may be restored to its original level and condition.
- D. Where the pipes are laid in streets, the remainder of the trench up to a depth of 1.5-ft below the bottom of the specified permanent paving shall be backfilled with common fill material in layers

not to exceed 1-ft and thoroughly compacted. The sub-base layer for paving shall be of aggregate sub-base and aggregate base coarse thoroughly compacted in 6-in layers.

- E. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted until selected material or screened gravel has been placed and compacted to a level 2-ft over the crown of the pipe.
- F. Backfill shall be brought up evenly on all sides. Each layer of backfill material shall be thoroughly compacted by rolling, tamping, or vibrating with mechanical compacting equipment or hand tamping, to 92 percent compaction. If rolling is employed, it shall be by use of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench.
- G. Water jetting may be used unless the refill contains too great a proportion of clay or loam to permit satisfactory drying. Water jetting shall consist of using a suitable length of pipe at least 1-1/4-in in diameter fitted with quick acting valve and sufficient hose to connect to hydrant or pump having adequate pressure and capacity. The full depth of backfill shall be thoroughly inundated by thrusting the pipe into the fill at frequent intervals with the valve open until all slumping ceases. Water for jetting may be obtained from City hydrants wherever possible. Water may be furnished by the City from these hydrants if reasonable care is exercised in its use and when approved by the Water Department. Puddling will not be allowed.
- H. If water restrictions are in force, obtain water elsewhere, or compact the backfill by other approved methods at no additional cost to this Contract
- I. Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 lbs. The material being spread and compacted in layers not over 6-in thick. If necessary, sprinkling shall be employed in conjunction with rolling or ramming.
- J. Bituminous paving shall not be placed in backfilling under any circumstances. Frozen material shall not be used under any circumstances.
- K. All road surfaces shall be broomed and hose-cleaned immediately after backfilling. Dust control measures shall be employed at all times.

3.7 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved streets, in shoulders; sidewalks, or in cross-country areas, thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.
- B. In and adjacent to streets, the top 18-in layer of trench backfill shall consist of compacted aggregate sub-base coarse and aggregate base coarse. Should the Contractor wish to use material excavated from the trench as gravel subbase for pavement replacement, the Contractor, at his/her own expense, have samples of the material tested by an independent testing laboratory at intervals not to exceed 500 feet, in order to establish its compliance with the specifications.
- C. Only material which has been tested and approved by the Engineer shall be allowed to be incorporated into the work. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved road shall be restored to a condition at least equal to that existing before work began.
- D. In sections where the pipeline passes through grassed areas, and at the Contractor's own expense, remove and replace the sod, or loam and seed the surface to the satisfaction of the Engineer.

3.08 TOLERANCES

- A. Top Surface of Backfilling: Under Paved Areas: Plus or minus 2 inch from required elevations.
- B. Top Surface of General Backfilling: Plus or minus one inch from required elevations.

3.09 FIELD QUALITY CONTROL

- A. Field testing will be performed under provisions of Section 01400.
- B. Tests and analysis of fill material will be performed in accordance with ANSI/ASTM D698 and Section 01400.
- C. Compaction testing will be performed in accordance with ANSI/ASTM D698 and Section 01400.
- D. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no cost to Owner.

3.10 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.

SECTION 02260

FILTER FABRIC

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

1. Furnish all materials and install filter fabric of the types, dimensions and in the location(s) shown on the Drawings and specified herein. B. Related Work Specified Elsewhere:

2. Temporary Erosion Control, Riprap and Stone Ditch Protection, and Gabions and Revet Mattresses are specified in the appropriate sections of this Division.

1.2 QUALITY ASSURANCE

A. A competent laboratory must be maintained by the manufacturer of the fabric at the point of manufacture to insure quality control.

B. During all periods of shipment and storage, the fabric shall be wrapped in a heavy duty protective covering to protect the fabric from direct sunlight, ultraviolet rays, temperatures greater than 140°F, mud, dirt, dust and debris.

1.3 SUBMITTALS

A. Manufacturer shall furnish certified test reports with each shipment of material attesting that the fabric meets the requirements of this Specification.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Filter fabric for use in stabilization, drainage, underdrains, erosion control, landscaping and beneath structures shall be formed in widths of not less than six (6) feet and shall meet the requirements of Table 1. Both woven and non-woven geotextiles are acceptable; however no "slit-tape" woven fabrics will be permitted for drainage, underdrain, and erosion control applications.

Table 1

Geotextile Mechanical Property	Test Method	Minimum Permissible Value
Grab Tensile Strength (both directions)	ASTM D4595-86	120 pounds
Grab Elongation	ASTM D4632-86	50 percent

Mullen Burst Strength	ASTM D3786-87	210 psi
Puncture Strength	ASTM D3787	60 pounds
Trapezoid Tear Strength	ASTM D4533-85	50 pounds
Water Flow Rate	ASTM D4491-85	120 gaUmin/sf
Equivalent Opening Size (EOS)	ASTM D4751	80
Coefficient of Permeability	ASTM D4491-85	0.2 cm/sec

The geotextile shall have property values expressed in "typical" values that meet or exceed the values stated above as determined by the most recent test methods specified above.

B. Filter fabric for use in reinforcement and under riprap shall meet the requirements of Table 2. Woven and non-woven geotextiles are acceptable.

Table 2

Geotextile Mechanical Property	Test Method	Minimum Permissible Value
Grab Tensile Strength (both directions)	ASTM 4595-86	195 pounds
Grab Elongation	ASTM D4632-86	20 percent
Mullen Burst Strength	ASTM D3786-87	340 psi
Puncture Strength	ASTM D3787	85 pounds
Trapezoid Tear Strength	ASTM D4533-85	85 pounds
Equivalent Opening Size (EOS)	ASTM D4751	U.S. Std. Sieve number(s) between #20 and #100

The geotextile shall meet or exceed the "typical" values stated above as determined by the most recent test methods specified above.

C. Filter Fabric for use in siltation fencing shall be the following:

1. Environfence 100X (Mirafi)
2. Supac 4NP (Phillip 66)
3. Exxon 180 Siltfence
4. Amoco 1380 Silt Stop
5. Harris Siltfence
6. Or equivalent

PART 3 - EXECUTION

- 3.1 Install filter fabric as shown on the drawings or as directed in appropriate specifications in this division or in accordance with manufacturer's instructions or as directed by the Engineer.

Section 02300

Road and Street Reconstruction

PART I GENERAL

1.01 WORK INCLUDED

A. General procedure for road and street reconstruction.

1.02 RELATED WORK

A. Section 02211 - Rough Grading: Preparation of site for paving.

B. Section 02223 - Backfilling: Compacted fill for paving.

C. Section 02513 - Asphaltic Concrete Paving

1.03 REFERENCES

A. Maine Department of Transportation Standard Specifications - Highways and Bridges, latest edition.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with Maine Department of Transportation Standard Specification - Highways and Bridges.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable standards for excavation and backfilling work on public property.

1.06 TESTS

A. Testing and analysis of backfill and other materials will be performed under provisions of Section 01400.

1.07 SUBMITTALS

A. Reserved.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Work may proceed in various weather conditions. In the opinion of the Engineer, if the weather conditions shall result in a substandard work product, the project time shall be halted until conditions improve. Work undertaken against the Engineers decision to suspend work shall be done so at the contractor's risk. In the event work conducted during this period is substandard and requires replacement, it shall be done so at the contractor's expense.

PART 2 - PRODUCTS

2.01 AGGREGATE SUBBASE AND BASE

- A. MDOT Specification, Section 703. (See Earthwork Section 02223 in these Specifications.)
- B. MDOT Specification, Section 304.02

2.02 COMMON BORROW

- A. MDOT Specification, Sections 702 and 703.
- B. Section 02223 these specifications.

2.03 RECLAIM MATERIAL FOR STABILIZED BASE

- A. MDOT Specification, Section 306.

2.04 STONE DITCH PROTECTION

Rock used for ditch protection shall consist of sound, durable rock which will not disintegrate by exposure to water or weather. Fieldstone, rough quarry stone, blasted ledge rock, or tailings may be used. The rock shall be graded within the following limits or as otherwise noted:

Sieve Size	Weight Passing
12"	90-100
4"	0-15

PART 3 - EXECUTION

3.01 GENERAL REFERENCE

- A. MDOT Specification, Section 203 (execution portions only, not measurement and payment).

02300-2

3.02 EXCAVATION - GENERAL

- A. Reserved.
- B. Prior to beginning excavating, grading, and embankment operations in any area, all necessary clearing in that area shall have been performed in accordance with MDOT Section 201 -- Clearing Right-of-Way.
- C. Unsuitable material shall be disposed of as directed and no material shall be wasted without permission. Excavating operations shall be conducted so that material outside of the limits of slopes will not be disturbed.
- D. The Engineer may designate as unsuitable those soils which cannot be properly compacted in embankments and all such unsuitable material shall be disposed of in approved waste storage areas or waste areas as directed.
- E. Suitable material taken from excavation shall be used in the construction of embankment, subgrade, and for backfilling as indicated on the plans, or as directed, except that if the volume of suitable

excavated material exceeds that required to Construct the embankments to the grades indicated, the excess shall be used to grade the areas of ultimate development or wasted as directed.

F. The Contractor shall give the Engineer sufficient time before beginning excavation to take necessary cross section elevations and measurements. The Contractor shall not excavate beyond the dimensions, slopes and elevations established, and no material shall be removed prior to the staking out and cross sectioning the site. Unless otherwise authorized, borrow material shall not be placed until after all suitable excavation has been placed in the embankment unless the use of granular borrow is called for on the plans or required for use under embankments or in conjunction with the use of excavated material or for the maintenance of traffic. If the Contractor places more borrow than is required and thereby causes a waste of suitable excavation material, the amount of such waste will be measured by the method deemed most appropriate and 115 per cent of the amount deducted from the borrow volume.

G. When different unit prices are bid for Common Excavation and Rock Excavation, the Contractor will be required to strip earth from the ledge to provide an opportunity for the Engineer to take the necessary measurements. When identical prices are bid for Common Excavation and Rock Excavation, the Contractor will not be required to strip the earth from the ledge.

H. When it is necessary to temporarily remove fencing designated to remain, the fencing shall be replaced by the Contractor at his expense in as good a condition as it was originally. The Contractor shall be responsible for the confinement of livestock when a portion of the fence is removed. When new fencing for confinement of livestock is required, it shall be erected before existing fencing is disturbed. Where new fencing cannot be erected in its final location, temporary fencing shall be at the Contractor's expense.

I. Excavating for obliterating old roadways or salvaging material from old roadways shall include all grading operations necessary to incorporate the old roadway into the new roadway and surroundings or placing salvaged material in a stockpile as directed.

J. The degree of finish for grading ditches and slopes, both fill slopes and cut slopes, shall be that obtainable from machine operations. Ditches shall be constructed to within 150 mm [6 inches] above or below the grade called for on the cross sections or as otherwise modified but in no case shall the ditch be finished in a condition that will not allow the flow of water. Ditches shall be graded to the extent that puddles will not form. All provisions for measurement and payment limits shall remain in force and no payment will be made for unauthorized work done beyond authorized pay limits.

K. Unstable slopes subject to sliding and slumping shall be excavated to the lines and grades shown or as directed. Immediately after each location is excavated approved stone or granular slope blanket backfill material shall be placed and shaped to match the adjacent slopes.

L. Ledge slopes shall be scaled (cleaned of all loose material) immediately as the excavation proceeds. The ledge slope shall then be examined by the Contractor to determine if the slope is stable. If the slope is not deemed stable upon this examination, then immediate steps shall be taken by the Contractor to insure the stability of the slope during construction. There will be no additional pay for any temporary protection required for the construction of the project.

3.03 ROADWAY EXCAVATION

A. Roadway excavation shall be maintained in such condition that the excavation surface will be well drained. Temporary drains, drainage ditches and culverts shall be constructed to intercept and divert water which may adversely affect the condition of the excavation and the prosecution of the work.

B. Excavation shall, in general, proceed in a direction upgrade. Subgrades shall be promptly graded and rolled to minimize absorption of water. Adjacent ditches shall be graded to the extent that puddles

will not form. Grubbing areas which cannot be drained shall be promptly filled with approved excavation or borrow to such an elevation that surface drainage will be effective. If, due to unusual circumstances, drainage by gravity cannot be accomplished, the Engineer may require the Contractor to provide adequate means of pumping the area. Pumping may be required on a 24 hour a day continuous basis and no direct compensation for cost of pumping will be made.

C. Muck shall be removed in such a manner to insure its complete removal with no areas remaining or trapped below the embankment. Excavated muck shall be deposited in designated waste storage areas as shown on the plans or as otherwise directed. When muck is encountered that was not contemplated on the plans, it shall be disposed of as indicated above.

D. Excavation adjacent to roots of trees or shrubs which are to remain shall be removed by hand.

E. When excavating results in a subgrade of unsuitable soil, the Engineer may require the Contractor to remove the unsuitable material and backfill the area with approved material. The Contractor shall conduct his operations in such a way that the Engineer can take the necessary measurements before the backfill is placed.

F. Material classified as rock, whether paid for as rock excavation, shall be excavated to the required depth. Care shall be taken that undrained pockets will not be left in the surface of the rock remaining.

G. The space between the rock remaining and the normal subgrade shown on the plans shall be backfilled with the designated aggregate subbase or aggregate base, pulverized rock or other approved material. The Contractor shall conduct his excavating and hauling work in a manner that will cause as little contamination as possible. Fine grading at the normal subgrade line will be required unless aggregate subbase or aggregate base material is used.

H. Ditches in rock cuts shall be constructed with no protrusions of rock above the designated rock cut pay lines. The space between the rock remaining and the finished surface of the ditch shall be backfilled with broken rock.

I. For earth and rock backslopes designated to be constructed on a 1 vertical to 2 horizontal slope or flatter, the slope shall be uniformly finished to within 150 mm [6 inches] above or 150 mm [6 inches] below the lines designated, but in no case shall projections of rock extend over 150 mm [6 inches] above the actual finished surface of the slope as constructed. Rock backslopes designated to be constructed on a 1 vertical to ¼ horizontal slope shall be excavated at least to a vertical plane.

J. Buried structures and obstructions, located within the designated limits of the work, shall be removed as part of the applicable excavation item for type of work being performed. Buried structures and obstructions located below or outside the required excavation, whose removal is ordered, shall be removed and such removal paid for as Common Excavation, Rock Excavation or Unclassified Excavation, whichever is applicable.

3.04 WASTE AREAS

A. It shall be the responsibility of the Contractor to obtain necessary permits and approvals from all pertinent State and Federal agencies and from the local municipality prior to the establishment of waste areas off the project. In addition, written permission of the property owners shall be obtained by the Contractor, including permission to dispose of waste in the area. Copies of all required permits shall be given to the Engineer.

B. Provisions shall be made for temporary and permanent erosion controls at waste areas which shall include, but not necessarily be limited to, grading the surface to drain, covering the surface with loam or other earthy material that will support growth and seeding and mulching.

3.05 PREPARATION OF EMBANKMENT AREAS

A. When the depth of the embankment, measured vertically below subgrade, does not exceed 1.5 m [5 feet] the area on which the embankment is to be placed shall be grubbed as defined in herein. When the embankment is more than 1.5 m [5 feet], as measured above, all vegetation in the embankment area shall be cut as specified in MDOT Specification Section 201 -- Clearing Right-of-Way.

B. When embankment is to be placed and compacted on hillsides or where new embankment is to be compacted against existing embankment, slopes steeper than 1 vertical to 2 horizontal shall be continuously benched by excavating steps into the existing material of sufficient width to permit operations of placing and compacting the additional material. Material removed shall be placed and compacted along with the new embankment material. When such benching is required, it will be as indicated on the plans, called for in the special provisions or as directed.

3.06 EMBANKMENT CONSTRUCTION - GENERAL

A. Layers of material for embankments shall start at the deepest portion of the fill and as placement progresses, layers shall be constructed approximately horizontal. Except for the first layer over swampy ground and cleared areas, roadway embankment of earth shall be placed in layers not exceeding 200 mm (8") loose measure, unless otherwise approved and the compacted as specified before the next layer is placed.

B. When it is impractical to construct layers over the full width of the cross section, partial width layers may be authorized.

C. Effective spreading equipment shall be used on each layer to obtain uniform thickness. Each layer shall be crowned and maintained free of ruts and ridges to provide direct drainage of water from the embankment. As the compaction of each layer progresses, grading and manipulating will be required to assure uniform density. Construction equipment shall be routed uniformly over the entire surface of each layer.

E. Embankments within 15 m [50 feet] of a bridge abutment, structural plate or box culvert type structure shall be compacted by the moisture and density control method as specified herein, except that rock embankments may be constructed over culverts as specified herein.

F. Water shall be added or removed, if necessary, in order to obtain required compaction. Aeration of excavated roadway materials to reduce the moisture content to within specified limits shall be as specified under MDOT Subsection 631.04.

G. When placing layers of specified thickness is not feasible, such as filling in water or over swampy ground, the initial layer of embankment may be constructed in one layer to an elevation where bridging will be accomplished. In embankment areas where no grubbing is required, the material placed in the first layer shall be of sufficient depth to cover all stumps.

H. When the excavation or borrow consists predominantly of fragments of such size that the material cannot be placed in embankments in layers of specified thickness without breaking down the pieces, such material may be placed in layers in thicknesses not exceeding the approximate average size of the larger rocks but in no case shall layers exceed 600 mm [2 feet]. Rocks exceeding this thickness shall be separated and collectively placed in accordance with the requirements for rock embankments. Each layer shall be leveled and smoothed with suitable leveling equipment and by even distribution of rock spells

and finer rock fragments or earth. The Engineer may test any or all layers by moisture and density control as specified in MDOT Subsection 203.12 which are constructed in depths exceeding 200 mm [8 inches]. The layers so constructed shall not be placed above an elevation 600 mm [2 feet] below the finish subgrade. The remainder of the embankment shall be composed of suitable material smoothed and placed in layers not exceeding 200 mm [8 inches], loose thickness, and compacted as specified for earth embankments.

I. Where guardrail is to be installed, rock shall not be placed in the embankment under the location of the guardrail to an elevation 1.2 m [4 feet] below the finished grade of the shoulder. Rocks, broken concrete and other solid materials shall not be placed in any portions of embankments where piling is to be placed or driven or where utility conduits are to be placed.

J. Excess or unsuitable excavated material, including rock and boulders, which cannot be used in embankments shall be placed in the nearest available waste areas. When it is impossible to dispose of all material in the manner described, the remainder shall be disposed of in approved waste areas.

K. When material obtained from roadway excavation is unsatisfactory for use in the formation of embankments due to excessive moisture content, can be rendered satisfactory for such use by combining it with granular material, the unsatisfactory material shall be combined with granular borrow or granular excavation when and as directed by the Engineer.

L. If the embankment is required to be deposited on only one side of abutments, wing walls piers or culvert headwalls, care shall be taken that the area immediately adjacent to the structure is not compacted excessively to the extent that it will cause overturning of or excessive pressure against the structure. When embankment is to be placed on both sides of a concrete wall, structural plate or box type structure, operations shall be so conducted that the embankment is always at approximately the same elevation on both sides of the structure.

M. At the close of each day's work, the embankment surface shall be graded, crowned, smoothed, rolled and sealed against infiltration of water.

N. The portion of the embankment and subbase outside a 1 vertical to 1½ horizontal slope extending from the edge of the finished shoulder to the existing ground, as shown on the Standard Detail entitled "Disposal of Waste Materials", will be required to be compacted only to the extent that stability of the slope is assured. As construction of the embankment progresses, material placed in the portion of the embankment outside the 1 vertical to 1 ½ horizontal slope shall not be placed above the elevation of the surface of the main embankment unless provisions are made to allow drainage of surface water from the embankment. The surface of the slopes shall be finished to present a uniform neat appearance.

O. The portion of the embankment inside the aforementioned 1 vertical to 1 ½ horizontal slope lines shall be compacted in accordance with the designated embankment compaction requirements specified for the project.

3.07 CONSTRUCTION OF EARTH EMBANKMENT - LAYER METHOD

A. The layer method will be required unless otherwise specified. Unless otherwise approved the material shall be deposited and spread upon compacted material in full width layers not more than 200 mm [8 inches] in depth, loose measure. Clay or loam soils shall be compacted by use of sheepsfoot or tamping type roller having a minimum weight on each tamper, under working conditions, of 1725 kPa 250 pounds per square inch of cross sectional bearing area. Sand or gravel soils shall be compacted by vibratory type compaction equipment or by pneumatic tired equipment and, if necessary, by the addition of water. A combination of the above or other methods capable of producing equivalent results may be used. The compacting operations shall be continued until each layer is compacted to its full depth and width.

B. With approval, the Contractor may place layers in excess of 200 mm [8 inches] and less than 600 mm [24 inches], loose measure, providing the specified compaction requirements are obtained and the Contractor agrees to make necessary test excavation for the Engineer to determine density.

C. The Contractor will be required to demonstrate that the compaction equipment and methods are obtaining satisfactory compaction.

D. Satisfactory compaction for the purpose of the demonstration is defined as not less than 90 percent of the maximum density. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, corrected by the Soils Laboratory Adjustment Chart, available at the MOOT Central Laboratory, Bangor, Maine. Field density tests will be made in accordance with AASHTO T191, adjusted to include only the material passing a 19 mm [1 inch] sieve or by an approved method using a calibrated nuclear device.

3.08 CONSTRUCTION OF EARTH EMBANKMENT WITH MOISTURE/DENISTY CONTROL

A. The contract will designate the areas to be constructed with moisture and density control and the distance below subgrade to which such methods shall be applied. The moisture content at the time of compaction shall be suitable to obtain the required density. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, corrected by the Soils Laboratory Adjustment Chart available at the MDOT Central Laboratory, Bangor, Maine. Field density tests will be made made in accordance with AASHTO T191, adjusted to include only the material passing a 19 mm [1 inch] sieve or by an approved method using a calibrated nuclear device.

B. All material in embankments above the elevation designated on the plans for moisture density control shall be placed at a moisture content suitable to obtain the required density. Each layer placed with controlled moisture shall be compacted to not less than 90 percent of the maximum density.

C. Density requirements will not apply to the portions of embankments constructed of material which cannot be tested in accordance with AASHTO T191 or when the material contains more than 30 percent material retained on a 50 mm [2 inch] square mesh sieve.

3.09 CONSTRUCTION OF ROCK EMBANKMENTS

A. The material for rock embankment shall be placed in compacted layers not exceeding 1 m [3 feet] in depth. Depositing the rock directly over the end of the fill from the hauling equipment will not be permitted, it shall be deposited on the fill and pushed into place. The top of the rock embankment shall be so choked that there will be no infiltration of the earth embankment placed on the top of the rock embankment.

B. This method shall be used only in fills in excess of 1.2 m [4 feet] in depth. In no case shall the rock embankment be placed within 300 mm [1 foot] of subgrade unless authorized.

C. When structures are located under rock embankment, they shall be covered with not less than 600 mm [2 feet] of earth excavation or borrow before the rock embankment is placed over the structures.

3.10 WINTER CONSTRUCTION OF EMBANKMENTS

A. Frozen material shall not be placed in the core embankment. The construction of embankments may continue during cold weather only when all frozen material in the top of the core embankment or the existing ground is moved to the waste area before placing additional material. When this procedure results in additional borrow quantity the additional borrow will not be paid for directly.

B. Compaction shall be in accordance with the specified method of embankment construction. When the prevailing temperatures are below -1 °C [30 °F] all material used in embankment construction shall have a moisture content, at the time of compaction, equal to or less than the optimum moisture content.

C. The embankment shall not be constructed upon frozen material except that such construction of embankments may be allowed providing the total depth of the added fill, including bases, plus the depth of the frozen material beneath does not exceed 1.5 m [5 feet]. Frozen material may be left in the embankment only if it has been compacted as specified prior to freezing. The Contractor shall not resume construction of any embankments built in this manner until all frozen material has thawed. If test holes are required to make this determination they shall be dug and backfilled with satisfactory compaction at the Contractor's expense. Before additional material is added, un-compacted material on the surface of such embankments shall be either re-compacted in accordance with the specified method of embankment construction or removed.

3.11 PREPARATION AND PROTECTION OF THE SUBGRADE

A. Unless otherwise provided, the subgrade shall be brought to a condition of uniform stability and compacted for the full width of the roadway by grading and rolling operation and shall be maintained to no tolerance above or 75 mm [3 inches] below the required grade and cross section. The surface shall be compacted to uniform density and stability and graded to the extent that puddles of water will not form. Additional material required as a result of low subgrade shall be furnished and placed at the expense of the Contractor.

B. The required compaction shall be the same as specified for embankments. When the subgrade occurs in cuts, the required compaction shall apply to a depth of 150 mm [6 inches] below subgrade unless otherwise specified.

C. The Contractor shall protect the subgrade from damage. Ditches and drains along the roadway shall be maintained to effectively drain the subgrade. In no case shall vehicles be allowed to travel in a single track and form ruts. No material shall be deposited on a subgrade until the subgrade has been approved.

3.12 USE OF GEOTEXTILE FABRICS - GENERAL

A. Unless called for in the specifications or plans, the Engineer shall indicate to the Contractor which, if any, areas of the subgrade shall receive geotextile fabric once the subgrade is exposed.

B. Prior to placement of the fabric, the site shall be prepared to provide a smooth surface, except as otherwise required, which is free from obstructions and depressions which could result in the fabric being torn or punctured during the cover operation. The fabric shall be unrolled loosely and positioned as smoothly as possible on the surface to minimize wrinkles and folds.

C. When the fabric is to be placed in the roadway, the cover material shall be dumped on previously placed cover material or at the edges of the fabric and then pushed onto the fabric. The first layer of cover material shall be greater than 200 mm [8 inches] and first compacted by a track bulldozer. At no time shall construction equipment be allowed on the fabric when the fabric is covered with less than 200 mm [8 inches] of compacted cover material. Ruts shall be filled with additional cover material to maintain the minimum 200 mm [8 inches] cover over the fabric.

D. When the fabric is to be placed as a reinforcement geotextile, care shall be taken to tension the fabric prior to completely covering with aggregate.

- E. When the fabric is to be placed in a ditch, shallow channel or downspout, the fabric shall be placed with the long direction parallel to the direction of water flow. All adjacent lengths of fabric shall be placed so that the upstream roll edge overlaps the downstream roll edge.
- F. When sloped riprap is to be placed on fabric, the Site shall be prepared to provide an undulating and uneven surface as much as is practical. The fabric shall be placed loosely to prevent any bridging of the uneven surface.
- G. Fabric to be placed on slopes shall have the long direction oriented up and down the slope as shown on the Standard Detail. All joints between adjacent fabric roll ends that may occur on the slope shall be overlapped shingle style.
- H. When riprap or stone ditch protection is placed on fabric, the stones shall be placed so that they do not puncture or otherwise damage the fabric.
- I. Except as hereinafter provided, fabric to be placed under riprap, where the stones weigh less than 110 kg [250 pounds], shall be Class A Erosion Control Geotextile.
- J. Fabric to be placed under heavy riprap, or where the stone weights in plain riprap are greater than 110 kg [250 pounds], shall be nonwoven Class A Erosion Control Geotextile with a 150 mm [6 inch] thick protective aggregate cushion placed on top of the fabric to protect the fabric from damage. The aggregate cushion may be omitted if it can be demonstrated to the Engineer that no damage will occur to the fabric by the placement of the stone.
- K. Fabric to be placed under stone ditch protection may be Class A Erosion Control Geotextile.
- L. The height of drop of riprap stones less than 100 kg (250 lb.) shall be no greater than 1 m [3 feet] when a 150 mm [6 inch] thick protective aggregate cushion is utilized nor any greater than 300 mm [1 foot] if stones are placed directly on the fabric. The 150 mm (6 inch) thick protective aggregate cushion shall be in addition to the specified riprap thickness and shall meet the requirements for granular borrow for underwater backfill.
- M. Riprap stones greater than 100 kg [250 pounds] shall not be placed by free-fall unless field trials are performed to the satisfaction of the Engineer, to determine the maximum height of drop that will not damage the fabric. In no case shall the maximum drop be greater than 1 m [3 feet].
- N. At no time shall riprap stones be rolled down the slope where fabric has been placed.

3.13 OVERLAPPING AND SEAMS

- A. Adjacent lengths of fabric shall be joined by overlapping a minimum of 450 mm [18 inches] at the ends and sides except when sewing is specified or fabric is placed on slopes. All overlaps on slopes shall be placed as follows:
- (1) For slopes steeper than 1 vertical to 3 horizontal: Sewn seams or minimum 1 m [3 foot] no
 - (2) For slopes flatter than 1 vertical to 3 horizontal: Sewn seams or minimum 450 mm [18 inches] overlaps and pins or stakes may be used to anchor the overlaps at the recommended spacings.
- B. When fabric is placed in the roadway, the fabric roll widths shall be chosen so that there will be a minimum number of overlaps of parallel rolls. The total width of surface Covered is shown on the Standard Detail.

C. When sewn seams are to be used, field or factory seaming by machine will be allowed. All seams shall be sewn with polypropylene, polyester, or Kevlar thread which is a contrasting color to the fabric material. The "J-seam" shall be used with double-locked stitches (Class 401), except the "flat" seam may be Used for repair of damaged in-place fabric. The length of a stitch shall be between 3.5 and 8 mm. [Seams shall contain between 3 and 7 stitches per inch]. All field seams shall be double stitched with two parallel passes and the 2 rows of stitching shall be approximately 13 mm [1/2 inch] apart and shall not cross at any point. All stitching shall be at least 25 mm [1 inch] from the fabric edge. All seams shall be exposed with the seam up so that repairs can easily be made if faulty seams are encountered during inspection, as shown on the Standard Detail.

3.14 PROTECTION OF FABRIC

A. To prevent damaging the fabric, the Contractor shall exercise necessary care while transporting, storing and installing the fabric.

B. Prior to installation, the fabric shall be protected from rain, from sunlight or other ultra-violet exposure and from dust, mud debris or other elements that may affect its performance. Fabric which is torn, punctured or otherwise damaged shall not be placed. During installation, fabric shall not be left exposed for more than five days without being covered.

C. Fabric which is damaged after placement shall be replaced or repaired by placing a piece of the same type of fabric over the damaged area with at least an 450 mm [18 inch] overlap in all directions. When sewn seams are used, the Engineer may require damaged fabric be stitched together or the damage repaired by sewing a patch of the fabric over the damaged areas.

3.15 BASE CONSTRUCTION REQUIREMENTS

A. The maximum compacted thickness of any aggregate subbase or aggregate base course layer shall not exceed 300 mm [12 inches] unless the Contractor demonstrates by a test section that the required compaction can be obtained. If compacted layers more than 300 mm [12 inches] are allowed, the Contractor shall agree to make the necessary excavations and backfilling in the course for the Engineer to determine the density.

B. When layers are constructed of differently graded aggregate, fine grading of the lower layer will not be required.

C. Each layer of aggregate shall be placed over the full width of the section except, the Engineer may authorize the Contractor to place less than full width layers, when existing traffic or other conditions restrict operations over the full width of the section. When the Contractor places material to complete the full width, the exposed edge of the previously placed aggregate shall be cleaned of all contamination before additional base or subbase aggregate is placed adjacent to it.

D. Aggregate base and subbase courses may be placed upon frozen surfaces when such surfaces have been properly constructed.

E. The material as spread shall be well mixed with no pockets of either fine or coarse material. Segregation of large or fine particles will not be allowed.

F. Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density has been achieved for the full width and depth of the layer. The maximum density shall be determined in accordance with AASHTO T180, Method C or D, corrected by

- the Soils Laboratory Adjustment Chart available at the MDOT Central Laboratory Bangor, Maine. Field density tests will be requested by the Owner. The surface, compaction and stability, shall be satisfactorily maintained until the pavement course has been placed. If required, additional water and fine material shall be applied to prevent checking, raveling or rutting.
- G. Fine material added to the base shall be uniformly blended into the top 225 mm [9 inches] of the course being stabilized. The blended material shall meet the requirements of Section 02223.
 - H. If the top of any layer becomes contaminated by degradation of the aggregate or addition of foreign material, the contaminated material shall be removed and replaced with the specified material.
 - I. All layers of aggregate subbase course shall be compacted to the required density immediately after placing. As soon as the compaction of any layer has been completed, the next layer shall be placed unless otherwise authorized .
 - J. The Contractor shall bear full responsibility for and make all necessary repairs to the subbase course and the subgrade until the full depth of the subbase course is placed and compacted. Repairs shall be considered incidental to other contract items.
 - K. The top of any aggregate base or subbase course layer shall be scarified and loosened for a minimum depth of 25 mm [1 inch] immediately prior to the placing of the next layer of aggregate base or subbase. This scarifying shall be considered incidental to placing the course, and no separate payment will be made.
 - L. The surface of each layer shall be maintained during compaction operations in such a manner that a uniform texture is produced and the aggregate firmly keyed. The moisture content of the material shall be maintained at the proper percent to attain the required compaction and stability.
 - M. If voids remain on the surface after the subbase course has been constructed to grade, compacted, checked and approved, sand leveling material shall be dumped and spread as directed. The quantity of sand leveling material shall be limited to the amount necessary to fill the voids and the minor low areas on the subbase surface. After the sand leveling material has been spread, it shall be completely rolled by a rubber tired roller with water applied if necessary. The surface of this material shall be maintained in its compacted and graded condition until the bituminous pavement has been placed. The "furnishing, spreading, compacting and maintaining of sand leveling material will be considered included in the measurement and payment of the subbase Course and no separate payment will be made.
 - N. The completed surface of the subbase or base course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of 10 mm (3/8").

Section 02510

Cold In-Place Pavement Recycling (Reclamation)

SECTION – DELETED

Section 02513

Asphalt Concrete Paving

PART I GENERAL

1.01 WORK INCLUDED

- A. Asphalt concrete paving.

1.02 RELATED WORK

- A. Section 02211 - Rough Grading: Preparation of site for paving.
- B. Section 02223 - Backfilling: Compacted fill for paving.

1.03 REFERENCES

- A. Maine Department of Transportation Standard Specifications - Highways and Bridges, latest edition.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with Maine Department of Transportation Standard Specification - Highways and Bridges.
- B. Mixing Plant: Conform to State of Maine Department of Transportation Standards.
- C. Obtain materials from same source throughout.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable standards for paving work on public property.

1.06 TESTS

- A. Testing and analysis of asphalt mix will be performed under provisions of Section 01400.

1.07 SUBMITTALS

- A. Submit proposed mix design of each class of mix to Engineer for review prior to commencement of work.
- B. Certified weight slips for each truck load of hot bituminous material.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Apply bituminous prime and tack coats only when the ambient temperature in the shade is at least 50°F for 12 hours immediately prior to application.
- B. Do not apply when the base surface is wet or contains an excess of moisture which would prevent uniform distribution and the required penetration.
- C. Construct asphalt concrete surface course only when atmospheric temperature is above 40°F, when the underlying base is dry, and when weather is not rainy.
- D. Base course may be placed when air temperature is above 30°F and rising. The underlying base gravel is firm and dry, in the Engineer's opinion.

PART 2 - PRODUCTS

2.01 AGGREGATE SUBBASE AND BASE

- A. MDOT Specification, Section 703. (See Earthwork Section 02200 in these Specifications.)

2.02 BITUMINOUS CONCRETE BASE COURSE

- A. MDOT Specification, Sections 401,702 and 703.
- B. 19.5mm

2.03 BITUMINOUS TACK COAT

- A. MDOT Specification, Section 401,702.
- B. Type AE-90, Emulsified Asphalt, Mixing.

2.04 BITUMINOUS CONCRETE SURFACE COURSE

- A. MDOT Specification, Sections 401,702 and 703.
- B. 9.5mm.

2.05 SIDEWALKS, DRIVES, AND SHIM

- A. MDOT Specification, Sections 401,702 and 703.
- B. 9.5mm
- C. Type E, Shim.

2.06 TEMPORARY PATCHING

- A. Hot or cold, at Contractor's option.

PART 3 - EXECUTION

3.01 AGGREGATE SUBBASE AND BASE

A. MDOT Specification, Section 304; Section 02300 of these specifications if applicable.

3.02 BITUMINOUS CONCRETE BASE COURSE

A. MDOT Specification, Section 401.

3.03 BITUMINOUS TACK COAT

A. Apply emulsified asphalt tack coat to curbing, gutters, manholes, pavement, etc. if required by Engineer to promote adequate bond. Generally a tack coat will not be required for pavement placed immediately following the rolling of the underlying course.

B. Apply at a rate of 0.05 to 0.15 gallons/square yard; excess coating and/or fat spots will not be permitted.

3.04 BITUMINOUS CONCRETE SURFACE COURSE

A. MDOT Specification, Section 403.

3.05 SIDEWALKS, DRIVES, AND SHIM

A. MDOT Specification, Section 403, 608.

3.06 TEMPORARY PATCHING

A. Place and compact per manufacturers' recommendation.

B. Trench patching: leave no more than 1000 linear feet (total for job, not in just one location) unpatched at any time.

3.07 EQUIPMENT

A. All main line trench shall be paved with a properly operating self propelled paver. Under no circumstances shall main line trench be paved by handwork. Cross trenches may be paved by hand.

B. A roller(s) sufficient to meet the density requirements and to provide a smooth, durable surface shall be used.

3.08 COMPACTION

A. Bituminous compaction shall take place at as high a temperature as possible without the mix bulging excessively in front of the rolls. For most dense graded mixes this is between 260* F and 285°F. At no time shall the pavement be allowed to fall below 175°F without compaction. Table 1 illustrates recommended laydown temperatures for various mix thickness giving 15 minutes + till 175°F mat temperature is reached.

3.09 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Compacted Scheduled Thickness: Within 1/4 inch of design thickness.

C. Variation from True Elevation: Within 1/2 inch.

3.10 FIELD QUALITY CONTROL

A. Field testing will be performed under provisions of Section 01400.

3.11 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for 3 days.

3.12 PERMANENT TRENCH REPAIR

A. Saw edges of existing pavement to provide a vertical binding face.

B. Remove temporary paving and sawn out existing paving.

C. Reset manhole frames and covers as necessary. For sewer work, it is advised to place a layer of base pavement over the existing manhole prior to mortaring the frame in place. Cut out a square around the manhole frame, set the frame to FINAL GRADE ABOVE SURROUNDING BINDER, patch in with binder, and place the final wearing surface as indicated on the details.

D. Apply tack coat to sawn edges.

E. Apply binder and surface pavement as indicated on the Contract Drawings.

Table 1

CESSATION REQUIREMENTS

Recommended Minimum Laydown Temperature

Base Temp.	1/2"	3/4"	1"	1 1/2"	2"	3" and greater
20-32						285 ¹
32-40				305	295	280
40-50			310	300	285	275
50-60		310	300	295	280	270
60-70	310	300	290	285	275	265
70-80	300	290	285	280	270	265
80-90	290	280	275	270	265	260
+90	280	275	270	265	260	255
Rolling Time in Minutes	4	6	8	12	15	15

¹ Increase by 15° when placement is on base or subbase containing frozen moisture.

From National Asphalt Pavement Association, Training Aid Series A12.

B. Pavement compacted below 175° may be removed if specified by the Engineer.

Section 02720

Storm Sewage Conveyance Systems

SECTION – DELETED

Section 02735

Manholes, Structures, Covers, and Frames

SECTION – DELETED

Section 02901

Miscellaneous Work Items and Cleanup

PART 1 - GENERAL

1.01. SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to do the miscellaneous work not specified in other sections but obviously necessary for the proper completion of the work as shown on the Drawings.
- B. When applicable, perform the work in accordance with other sections of this Specification. When no applicable specification exists, perform the work in accordance with Maine Department of Transportation Standard Specifications, latest edition.
- C. The Work of this section includes but is not limited to the following:
 - 1. Crossing and relocating utilities
 - 2. Restoring of driveways and sidewalks
 - 3. Cleaning up.
 - 4. Incidental work.
 - 5. Videotapes of Project.
 - 6. Protection and/or removal and reinstallation of signs, lampposts, and mailboxes.
 - 7. Restoration of and replacement of curbing.
 - 8. Protection and bracing of utility poles.
 - 9. Restoring easement and rights of way.
- D. Submit to the Engineer a breakdown of the lump sum for miscellaneous work and cleanup including the above items as a minimum. This breakdown shall be subject to the approval of the Engineer and when so approved shall become the basis for determining progress payments and for negotiation of change orders.

PART 2 - PRODUCTS

2.01 MATERIAL

A. Materials required for this section shall be the same quality of materials that are to be restored. Where possible, re-use existing materials that are removed.

PART 3 - EXECUTION

3.01 CROWSSING AND RELOCATING EXISTING UTILITIES

A. This item includes any extra work required in crossing culverts, water courses, including brooks and drainage ditches, storm drains, gas mains, water mains, electric, telephone, gas and water services and other utilities. This work shall include but is not limited to the following: bracing, hand excavation and backfill, and any other work required for crossing the utility or obstruction not included for payment in other items of this specification. Notification of Utility companies shall be as specified by law.

B. In locations where existing utilities cannot be crossed without interfering with the construction of the work as shown on the Drawings, remove and relocate the utility as directed by the Engineer or cooperate with the Utility Companies concerned if they relate the utility.

C. At pipe crossings and where designated by the Engineer, furnish and place either compacted crushed stone, screened gravel bedding, or flowable fill so that the existing utility or pipe is firmly supported for its entire exposed length. The bedding shall extend to the mid-diameter (springline) of the pipe crossed. Payment for support is incidental to the new utility being installed.

3.02 RESTORATION OF DRIVEWAYS AND SIDEWALKS AND CURBING

A. Existing public and private driveways disturbed by the construction shall be replaced. Paved drives shall be repaved to the limits disturbed and to a thickness equal to that prior to construction unless otherwise directed by the Engineer. Gravel drives shall be repaved and regarded.

B. Existing public and private sidewalks disturbed by the construction shall be replaced with sidewalks of equal quality and dimension and are considered incidental to the project unless otherwise accounted for as a bid item.

C. Curbing shall be replaced with similar material (i.e. bituminous of like style, granite, etc.) and such work is considered incidental to the project unless otherwise accounted for as a bid item.

3.03 CLEANING UP

A. Remove all construction material, excess excavation, buildings, equipment, and other debris remaining in the job as a result of construction operations and restore the project area to a neat and orderly condition as approved by the Engineer and Owner.

3.04 INCIDENTAL WORK

A. Do all incidental work not otherwise specified, but obviously necessary to the proper completion of the Contract as specified and as shown on the Drawings. Incidental work shall include erosion and sedimentation control measure as detailed in the Contract Documents.

3.05 VIDEOTAPES OF PROJECT

A. Reserved.

3.06 RESTORATION AND REPLACEMENT OF SIGNS, LAMPPOSTS, MAILBOXES

- A. Existing signs, lampposts, and mailboxes which may be damaged or removed during the course of the project shall be reinstalled in a vertical position at the same location form which they were removed (unless such location no longer exists and in which case a new location must be found). Damaged items shall be replaced with an item equal to or better than the damaged item. A concrete anchor shall be provided as necessary, at no additional cost, to ensure a rigid alignment. Care shall be exercised in the reinstallation of all items to prevent damage to the newly installed project.

3.07 PROTECTION AND BRACING OF UTILITY POLES

- A. Be responsible for making all arrangements with the utility companies for the bracing and protection of all utility poles that may be damaged or endangered by the project. Work under this section shall include the related removal and reinstallation of guy wires, or support poles, whether shown on the Drawings or not.

3.08 RESTORATION OF EASEMENTS AND RIGHT-OF-WAYS

- A. Be responsible for all damage to private property due to the operations. Protect from injury all walls, fences, cultivated shrubbery and vegetables, fruit trees, flower gardens, underground facilities such as water or sewer pipe, or other utilities which may be encountered along the project route. If removal and replacement is required, it shall be done in a workmanlike manner so that replacement is equivalent to that which existed prior to construction.
- B. Existing lawn and sod surfaces damaged by construction shall be replaced. Cut and replace the lawn and sod, or restore the areas with an equivalent depth and quality of loam, seed, and fertilizer as necessary to produce an stand of grass at least equal to that existing prior to construction. These areas shall be maintained and reseeded, if necessary, until all work under this Contract has been completed and accepted. Any additional work required to restore property to the original condition shall be performed.
- C. Existing trees, shrubs, plants, and bushes outside of easements shall be fully protected. The work shall also include removing and replacing those trees. Shrubs, and bushes as indicated on the Drawings. It shall include the careful excavation of the root ball which shall be wrapped with burlap while to of the ground. Replant them after backfilling the trench, stake them in an upright position and periodically water replanted trees, bushes, and shrubs. Be fully responsible for ensuring that any and all trees, bushes, and shrubs removed and replanted “take” and return to a viable state. Any replanted item that fails to “take” or that is so damaged as to be unsuitable for replanting shall be replaced, at no additional cost to the Owner, with an item of equal size and caliper.
- D. All plants shall be guaranteed for not less than one full year from the time of acceptance of work completed. At the end of the one year period, any plant that is missing, dead, or not in satisfactory growth, as determined by the Owner or the Owner’s representative, shall be replaced at no additional cost to the Owner. After all necessary corrective work has been completed, the Owner will certify in writing of final acceptance.

Section 02936

Seeding

SECTION- DELETED

SECTION 02950

SEDIMENTATION AND EROSION CONTROL MEASURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Establishment and maintenance of temporary and permanent drainage areas.
- B. Construction, stabilization and maintenance of temporary construction entrances.
- C. Construction and maintenance of temporary and permanent outfalls, swales, waterways, embankments.
- D. Temporary and permanent vegetative stabilization.
- E. Establishment and maintenance of designated stockpile areas.
- F. Construction and maintenance of silt fences and hay bale barriers.
- G. All erosion and sediment control work required for the safe conduct of the work, whether or not specifically mentioned in these Specifications or indicated on the Drawings.

1.2 REFERENCES

- A. Quality, grades of materials and installation procedure: In conformance with applicable code and standards including:
 - 1. Environmental Quality Handbook, Maine Soil and Water Conservation Commission (Handbook).
 - 2. American Society for Testing and Materials (ASTM).
 - 3. State of Maine, Department of Transportation, Standard Specifications Highway and Bridges (MDOT).
 - 4. Maine Erosion and Sedimentation Control Handbook for Construction: Best Management Practices 3/91.
- B. Land, Air and Water Pollution: Comply with Pollution Control Standards for the State of Maine applicable to the work to ensure that no pollution is caused by work of this Contract.
- C. Soil Erosion and Sediment Control: Implement soil erosion and sediment control in strict accordance with provisions of the Environmental Quality Handbook.

1.3 DEFINITIONS

1.3.1 Sediment

Soil and other debris that have eroded and have been transported by runoff water or wind.

1.3.2 Dust

Earthy material and any substance reduced to fine powder.

1.3.3 Solid Waste

Rubbish, debris, garbage, and other discarded solid materials, except hazardous waste as defined in paragraph entitled "Hazardous Waste," resulting from industrial, commercial, and agricultural operations and from community activities.

1.3.4 Rubbish

Combustible and noncombustible wastes such as paper, boxes, glass, crockery, metal, lumber, cans, and bones.

1.3.5 Debris

Combustible and noncombustible wastes such as ashes and waste materials resulting from construction or maintenance and repair work, leaves, and tree trimmings.

1.3.6 Oily Waste

Petroleum products and bituminous materials.

1.4 SUBMITTALS (In Accordance With Section 01300)

1.4.1 Samples

A. Geotextile Fabric.

1.4.2 Record of Existing Conditions

A. Pre-construction video or photographs.

1.4.3 Factory Test Reports

A. Geotextile Fabric.

1.4.4 Certificate of Compliance

A. Seed Mix

1.5 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including but not limited to water, air, and noise pollution.

1.5.1 Environmental Protection Plan

TEN days after the award of contract, the Contractor shall meet with the Project Engineer and Contracting Officer to discuss the proposed environmental protection plan and to develop mutual understanding relative to the details of environmental protection, including measures for protecting natural resources, required reports, and other measures to be taken.

1.5.1.1 Environmental Planning

Fourteen days after the meeting, the Contractor shall submit to the Architect/Engineer the proposed environmental plan for further discussion, review, and approval.

1.5.1.2 Commencement of the Work

As directed by the Contracting Officer, following approval.

1.5.2 Pre-construction Survey

Perform a preconstruction survey of the project site and take photographs or video tape showing existing environmental conditions in and adjacent to the site. Provide a copy of photographs to the Architect/Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

- A. All Products: As specified by Environmental Quality Handbook
- B. All Fill Materials: In accordance with requirements of Section 02223.
- C. Temporary Vegetative Stabilization: Temporary Seeding for graded or cleared areas which are subject to erosion for a period of 14 days or more. Vegetation in accordance with Handbook.
- D. Permanent Vegetative Stabilization: Seeding for graded or cleared areas subject to erosion where a permanent, long-lived vegetation cover is needed. Vegetation in accordance with Handbook.
- E. Riprap Waterways, Trapezoidal Outlets and Outfalls:
 - 1. Riprap: Sizes indicated.
 - 2. Drainage Fabric:
 - a. Outlets, Outfalls: Mirafi 700X.
- F. Grass Waterways:
 - 1. Vegetation: In accordance with Handbook; Section 02930, Seed Mix A.
 - 2. Erosion Control Mesh: North American Green DS150.
 - 3. Pins: U or T type as recommended by fabric manufacturer.
- G. Hay Bale Barriers, Dams:
 - 1. Barriers: Wire or nylon bound @traw or hay bales.
 - 2. Stakes: Steel rebar or 2 x 2 inch wood stakes.

H. Silt Fence:

1. Posts:

- a. Wood: Minimum 2 inch hardwood stakes.
 - b. Steel: Type T or Type U.
2. Woven Wire: 14 ga.; maximum 6 inch mesh.
3. Fabric: High strength polypropylene netting treated to ensure protection against sunlight degradation:
- a. Mirafi Silt Fence.
 - b. Amoco Propex Silt Stop.
 - c. Poly Filter X.
 - d. Stabilina T140N.

I. Prefabricated Silt Fence: Mirafi Envirofence or equal approved by Architect.

J. Approved Filter Cloths:

1. Filter: Mirafi 140N.
2. Embankment: Mirafi 700X.
3. Slope Protection: North American Green or equal approved by Architect.
4. Channel Protection: North American Green.
5. Substitutions: Under provisions of Section 01600.

K. Stone Check Dams:

1. Stone: Sizes indicated.
2. Fabric: Mirafi 500X.

PART 3 EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Land Resources

3.1.1.1 Protection of Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the Architect/Engineer permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the Architect/Engineer. Where such use of attach ropes, cables, or guys is authorized, the Contractor shall be responsible for any resultant damage.

Protect existing trees which are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. By approved excavation, remove trees with 30 percent or more of their root systems destroyed.

3.1.1.2 Grading

- A. Limit initial grading to that required to install required sediment and

erosion controls.

B. Extent: Remain just ahead of planned new construction.

C. Plan to control runoff and contain erosion.

D. Do not place fill before existing vegetation has been removed.

E. Do not impair existing surface drainage, create potential hazards, cause hazardous erosion, or cause sediment to collect in drainage systems on adjacent properties, alleys, streets or highways by grading operations.

F. Riprap Outfalls, Outlets, Waterways: Construct in accordance with details. Embed riprap in approved fabric.

G. Grass Waterways: Construct in accordance with details for specific profile. Pin fabric mesh to subgrade with U or T pins in accordance with fabric manufacturer's recommendations.

H. Hay Bales:

1. Place at areas indicated in rows with ends tightly butted.
2. Embed each bale a minimum of 4 inches into soil.
3. Securely anchor in place with two stakes driven 1-1/2 to 2 feet into ground.

I. Silt Fence:

1. Establish silt fence at areas indicated and as required for control prior to starting work. Repair as needed.
2. Space posts as required to adequately support wire and cloth against flow and at a maximum of 6 feet oc. Embed posts into ground a minimum of 18 inches.
3. Fasten woven wire fence securely to posts with wire ties or staples.
4. Fasten filter cloth to wire mesh at top and mid-section with ties spaced every 24 inches; overlap edges minimum 6 inches and fold. Embed filter cloth minimum 8 inches into ground.

3.1.1.3 Borrow Pit Areas

Manage and control borrow pit areas to prevent sediment from entering nearby streams or lakes. Restore areas, including those outside the borrow pit, disturbed by borrow and haul operations. Restoration includes grading, replacement of topsoil, and establishment of a permanent vegetative cover. Uniformly grade side slopes of borrow pit to not more than a slope of 1 part vertical to 2 parts horizontal. Uniformly grade the bottom of the borrow pits to provide a flat bottom and drain by outfall ditches or other suitable means. Stockpile topsoil remove during the borrow pit operation, and use as part of restoring the borrow pit area.

3.1.1.4 Protection of Erodible Soils

Immediately finish the earthwork brought to a final grade, as indicated or specified. Immediately protect the side slopes and back slopes upon completion of rough grading. Plan and conduct earthwork to minimize the duration of exposure of unprotected soils.

3.1.1.5 Temporary Protection of Erodible Soils

Use the following methods to prevent erosion and control sedimentation:

3.1.1.6 Mechanical Retardation and Control to Runoff

Mechanically retard and control the rate of runoff from the construction site. This includes construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses. Operate track-driven equipment perpendicular to steel slopes.

3.1.1.7 Vegetation and Mulch

Provide temporary protection on sides and back slopes as soon as rough grading is completed or sufficient soil is exposed to require erosion protection. Protect slopes by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

- a. Seeding: Provide new seeding where ground is disturbed. Include topsoil or nutriment during the seeding operation necessary to establish or reestablish a suitable stand of grass. The seeding operation shall be as specified in Section 02930, "Turf".

3.1.1.8 Stabilization

A. Stabilize all cleared or graded areas. Stabilize with temporary or permanent vegetation, mulch, or paving as indicated on Drawings within 15 days of obtaining final grade or 30 days after obtaining temporary grade.

B. For vegetating critical areas where erosion is imminent, place and repeatedly replace adequate mulch, fertilizer, and seed until a vigorous and adequate growth of turf has been established over greater than 80 percent of the area.

3.1.1.9 Replacement

Remove trees and other landscape features scarred or damaged by equipment operations, and replace with equivalent, undamaged trees and landscape features. Obtain Architect/Engineer's approval before replacement.

3.1.1.10 Temporary Construction

Remove traces of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other signs of construction. Grade temporary roads, parking areas, and similar temporarily used areas to conform with surrounding contours.

3.1.1.11 Burnoff

Burnoff of the ground cover is not permitted.

3.1.1.12 Dust Control

Keep dust down at all times, including during non-working periods. Sprinkle or treat, with dust suppressants, the soil at the site, haul roads, and other areas disturbed by operations. Dry power brooming will not be permitted. Instead, use vacuuming, wet mopping, wet sweeping, or wet power brooming. Air blowing will be permitted only for cleaning non-particulate debris such as steel reinforcing bars. Only wet cutting will be permitted for cutting concrete blocks, concrete, and bituminous concrete. Do not unnecessarily shaking bags of cement, concrete mortar, or plaster.

3.1.2 Water Resources

3.1.2.1 Erosion Control

Provide measures specified in Part 3.1 of this section to prevent sedimentation of all wetlands, streams, rivers, ponds and other water resources.

3.1.2.2 Resource Protection Zone

Provide a 25 foot resource protection zone on both sides of a stream or river or adjacent to a wetland or pond. Entry into a crossing the zone except in areas specified by vehicular or pedestrian traffic shall be prohibited. Boundaries shall be clearly marked prior to start of construction.

3.1.2.3 Utility Crossings and Crossings

Where utilities or temp. access roads are indicated to cross streams or wetlands, all appropriate rules, laws, ordinances and regulations by governing and permitting authorities having jurisdiction shall be followed.

3.1.2.4 Sedimentation

In addition to measures specified in this section and shown on the drawings, additional steps shall be taken where necessary, in order to prevent sedimentation of water. Evidence of sedimentation includes visible gully erosion, discoloration of water by suspended particles and slumping of banks.

3.1.2.5 Oily Wastes

Prevent oily or other hazardous substances from entering the ground, drainage areas, or local bodies of water. Surround all temporary fuel oil or petroleum storage tanks with a temporary earth berm of sufficient size and strength to contain the contents of the tanks in the event of leakage or spillage.

3.1.2.6 Fish and Wildlife Resources

Do not disturb fish and wildlife. Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as indicated or specified.

3.2 MAINTENANCE

A. Vegetative Stabilization: Irrigate to prevent loss of stand of protective vegetation. Regularly inspect and overseed as necessary. Immediately reestablish damaged stands.

B. Hay Bales: Inspect weekly and after every rain; adjust as needed, removing material when bulges develop.

C. Silt Fence: Inspect weekly and after every rain; adjust as needed, removing material when bulges develop or when silt build up exceeds 1/3 of the fence height.

D. Construction Entrances: Inspect and repair after every rain. Maintain in a condition to prevent tracking or flowing of sediment onto public right-of-ways. Dress with stone as required.

E. Swales, Outlets, outfalls: Inspect regularly and after every rain;

F. See notes on Plan sheet for other related maintenance.