

City of Rochester, NH

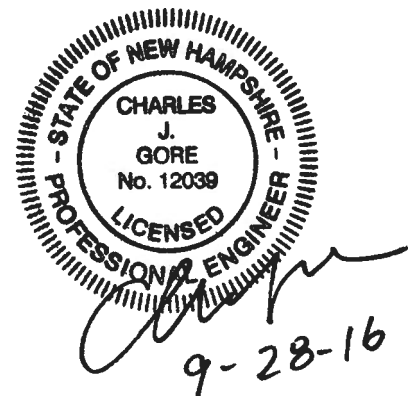
Bid No. 17-18



Colonial Pines Sewer -
Spaulding Turnpike Crossing

ADDENDUM No. 2

September 28, 2016



Brown AND Caldwell :

COLONIAL PINES SEWER – SPAULDING TURNPIKE CROSSING

BID NO. 17-18

ROCHESTER, NH

ADDENDUM NO. 2

September 28, 2016

To be considered as part of the contract drawings and specifications for the Colonial Pines Sewer – Spaulding Turnpike Crossing Project.

BIDDER QUESTIONS

- Q1. There is an item for temporary water and also specifications that indicate temporary water is necessary, yet the plans or specifications do not identify necessary locations for temporary water or anticipated properties that may be affected by the water system work. Please provide anticipated locations and properties requiring temporary water during construction?
- A1. The Contractor is required to maintain water supply and service during construction. The item is provided for the Contractor to install and maintain temporary water mains, water services and hydrants along Birch Drive and Railroad Avenue in compliance with City of Rochester requirements. Temporary water is required for taking the existing water main and hydrants out of service during construction, connections, flushing, and disinfection and will remain until the hydrants at the end of Birch Drive and Railroad Avenue are installed, tested and accepted at the end of the project schedule. The exact location and schedule of installation of temporary water will be determined by the Contractor based on the Contractor's construction and laydown areas, temporary drives, and schedule for the work.
- Q2. Please explain the difference in items 1A/1B. Is item 1B intended to be for water main removal in the same trench? Does this apply to other utility pipes or just water main removal? What are the limits of Water Main Removal?
- A2. Item 1A is for removal and disposal of pipe (water or other utility) outside trench limits (of replaced water main) as directed. Item 1B is for removal and disposal of water main (within trench limits of replaced water main). The 6-inch water main beneath Spaulding Turnpike will be abandoned in place. The limits of the 6-inch water main to be removed will be based on the Contractor's construction and laydown areas, temporary drives, and schedule for the work. See revised Section C-410 and revised Section 01025.
- Q3. Specification Section 02447-5 calls for "Continuous Jacking". Please confirm the intent is to Jack (24) hours a day until completion of Pipe Jacking.

- A3. Jacking operations will be allowed 24 hours per day subject to approval from the Owner and NHDOT. The intent is for Work to progress in a continuous manner to minimize the duration of disruption to residents, monitoring costs and field engineering costs.
- Q4. Will construction of Temporary Widening or Temporary Driveways be paid under Gravel and Asphalt items or will these be subsidiary to the traffic control item?
- A4. Temporary widening and temporary access driveways will be paid under gravel and asphalt items. Restoration will be paid under the appropriate bid item.
- Q5. How will Asbestos Pipe be handled if encountered?
- A5. Asbestos pipe materials are not located in this area of the City. If encountered, the pipe will be handled in accordance with applicable local, state and federal regulations. Payment for this work will be via change order.
- Q6. Is Soil Stabilization Grouting required? Could there be an allowance included in the bid for this?
- A6. Soil stabilization grouting, also referred to as permeation grouting, is required. See revised Section C-410 and revised Section 01025.
- Q7. Please clarify the intent of the shoring. The specification indicates the shoring is to remain in place, but there is an item/allowance for sheeting left in place. Should we bid this based on sheeting being removed or left in place?
- A7. Sheeting is to remain in place to provide for future access to the casing pipe. Sheeting left in place is to be paid per square foot.

SPECIFICATIONS

SECTION C-200

DELETE paragraph 4.02 A.4. in its entirety and **REPLACE** with the following:

“4. Geotechnical Engineering Report: The Bidding Documents contain a Geotechnical Engineering Report (GER). The GER describes subsurface conditions that are anticipated to be encountered by Contractor during construction in specified locations. Bidders shall be responsible to obtain additional subsurface information necessary for design, and responsible for selection of means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs incidental thereto.”

SECTION C-410

DELETE Section C-410 in its entirety and **REPLACE** with attached Section C-410.

SECTION C-700

7.08 Permits, Paragraph A. **DELETE** “, including a storm water pollution prevention plan (SWPPP) – Refer to general conditions and specification Section 02540 for additional details”

SECTION C-800

SC 6.03 K. 6. **DELETE** “Lin Associates, SED Associates, TFMoran, New Hampshire Northcoast Railroad, and Rochester Cemetery Association”

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INSERT “Section 01370 Schedule of Values”

SECTION 01010

DELETE Section 01010 in its entirety and **REPLACE** with attached Section 01010.

SECTION 01014

DELETE Section 01014 in its entirety and **REPLACE** with attached Section 01014.

SECTION 01025

DELETE Section 01025 in its entirety and **REPLACE** with attached Section 01025.

SECTION 01370

INSERT attached Section 01370.

SECTION 01410

Paragraph 2.01 E. and F. **DELETE** “conform to specification Section 03300”.

DELETE paragraphs 3.01 D.3., 3.01 I., 3.01 J. and 3.01 L. in their entirety.

SECTION 01570

Paragraph 1.01 **ADD** the following: “Refer to Section 01500 for additional requirements. Traffic Control Plans shall be prepared by a Traffic Engineer licensed in the state of New Hampshire and shall comply with the requirements of the Manual of Uniform Traffic Control Devices and shall comply with the Encroachment Permit issued for the project.”

SECTION 02050

Paragraph 3.01 A. **ADD** the following: “Remove and dispose flexible pavement and gravels associated with Contractors operations, temporary ramps over water lines, temporary roadway widenings, and temporary driveways.

SECTION 02100

Paragraph 1.01 C. **ADD** the following paragraph: “3. Provide 6-foot high chain link security fence and 4-foot high orange safety fence at the perimeter of Contractor’s work site.”

SECTION 02210

Paragraph 3.02 B. **DELETE** “two cubic yard” in the first and second sentences and **REPLACE** with “one cubic yard”.

Paragraph 3.02 B. **ADD** the following: “For casing pipe installation, excluding jacking and receiving pits, rock excavation, including boulders and cobbles, greater than 1 cubic foot shall be considered Obstruction Removal.”

SECTION 02302

DELETE Section 02302 in its entirety and **REPLACE** with attached Section 02302.

SECTION 02447

Paragraph 1.03 A. 4. **ADD** the following: “from NHDOT” following “written preapproval”.

Paragraph 1.1 B. **ADD** the following: “Perform soil borings and field soils testing and laboratory soils testing for use in preparing a Detailed Soil Stabilization Grouting Plan.”

Paragraph 3.03 A. 4. **ADD** the following: “Cobbles and boulders shall be removed from jacking/receiving pits. Removal of cobbles and boulders less than 1 cubic foot in size shall be incidental to the project.”

SECTION 02540

DELETE Section 02540 in its entirety and **REPLACE** with attached Section 02540.

Attachments

1. Section C-410
2. Section 01010
3. Section 01014
4. Section 01025

5. Section 01370
6. Section 02302
7. Section 02540

END OF ADDENDUM 2

BY ORDER CITY OF ROCHESTER, NH

**C-410
BID FORM**

Colonial Pines Sewer – Spaulding Turnpike Crossing
City of Rochester Bid No. 17-18

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ARTICLE 1 – BID RECIPIENT

- 1.01 This Bid is submitted to:

City of Rochester, NH

31 Wakefield Street

Rochester, NH 03867

- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER’S ACKNOWLEDGEMENTS

- 2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER’S REPRESENTATIONS

- 3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

| <u>Addendum No.</u> | <u>Addendum, Date</u> |
|---------------------|-----------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

- E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.
- F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 BID ITEMS

A. Bidder acknowledges the following Work will be considered as PART A.

Bid items shall include all surface restoration work and incidental work.

Traffic Control Plan and Maintenance of Traffic and NOI, SWPPP, Monitoring and Maintenance of Erosion and Sediment Controls and Catch Basins items shall be applicable for the entire project area and adjacent streets.

5.02 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

PART A

| PART A Bid Item No. | Description | Item Quantity | Units | Unit Price | Total Value of Item (\$) |
|---------------------|---|---------------|-----------|------------|--------------------------|
| 1a | Remove & Dispose Existing Pipe (water or other utility) Outside Trench Limits As Directed | 50 | LF | | |
| 1b | Remove & Dispose Existing 6”/8” Water Main Within Trench Limits | 75 | LF | | |
| 1c | Plug and Abandon Existing 6” Water Main in Place Using Flowable Fill | 400 | LF | | |
| 2a | Soils Testing for Soil Stabilization Grouting Plan | 1 | LS | | |
| 2b | Detailed Soil Stabilization Grouting Plan | 1 | LS | | |
| 2c | Soil Stabilization Grouting | 1 | Allowance | \$200,000 | \$200,000 |
| 2d | Spaulding Turnpike Crossing | 1 | LS | | |

| PART A Bid Item No. | Description | Item Quantity | Units | Unit Price | Total Value of Item (\$) |
|--------------------------------|--|--------------------------|--------------|-------------------|-------------------------------------|
| 2e | Obstruction Removal – 1 CF or Larger | 5 | CF | | |
| 2f | Spaulding Turnpike Crossing Steel Sheet piling Left In Place As Directed by the Engineer to be paid at a unit price of \$35/sq ft | 1 | Allowance | \$200,000 | \$200,000 |
| 2g | Condition Surveys and Vibration Monitoring – Section 02302 | 1 | LS | | |
| 2h | Condition Surveys and Vibration Monitoring – Encroachment Permit Required | 1 | Allowance | \$10,000 | \$10,000 |
| 2i | Traffic Control Plan – Encroachment Permit Required | 1 | Allowance | \$5,000 | \$5,000 |
| 2j | State Police Details – Encroachment Permit Required | 1 | Allowance | \$10,000 | \$10,000 |
| 2k | Spaulding Turnpike Crossing Surety Bond | 1 | LS | | |
| 3a | 12" Ductile Iron Sewer | 428 | LF | | |
| 4a | 5' Dia. Precast Concrete Sewer Manhole Base Unit | 2 | EA | | |
| 4b | 5' Dia. Precast Concrete Sewer Manhole Walls/Cones | 25 | VF | | |
| 4c | Sewer Manhole Frame & Cover | 2 | EA | | |
| 5a | 6" Water Main | 20 | LF | | |
| 5b | Additional Fittings | 2000 | LB | | |
| 6a | Hydrant Assembly – End of Birch Drive | 1 | EA | | |

| PART A Bid Item No. | Description | Item Quantity | Units | Unit Price | Total Value of Item (\$) |
|--------------------------------|--|--------------------------|--------------|-------------------|-------------------------------------|
| 6b | Transfer Hydrant to 24-inch Water Main – End of Railroad Avenue | 1 | EA | | |
| 7a | 6" Gate Valve & Box | 2 | EA | | |
| 7b | 24" x 6" Tapping Sleeve and Valve | 1 | EA | | |
| 8a | Connect to Existing Water Main - Railroad Avenue | 1 | LS | | |
| 8b | Connect to Existing Water Main - Birch Drive | 1 | LS | | |
| 9 | Temporary Water Main, Including Services & Hydrants | 1000 | LF | | |
| 10a | Exploratory Excavation at Existing Utilities | 50 | CY | | |
| 10b | Exploratory Excavation Ordered by the Engineer | 50 | CY | | |
| 10c | Vacuum Exploratory Excavation Ordered by the Engineer | 50 | CY | | |
| 10d | Post-Construction Clean & CCTV & Survey New Casing Pipe - Spaulding Turnpike | 380 | LF | | |
| 10e | Post-Construction Clean & CCTV & Survey New Sewer | 428 | LF | | |
| 11a | Additional Excavation and Removal & Replacement with Suitable Material | 50 | CY | | |
| 11b | Removal and Replacement of Unsuitable Backfill | 50 | CY | | |
| 11c | Gravel Base Course | 175 | CY | | |
| 11d | Crushed Gravel Base Course | 90 | CY | | |
| 11e | Additional Crushed Stone | 20 | CY | | |
| 11f | Flowable Fill | 10 | CY | | |

| PART A Bid Item No. | Description | Item Quantity | Units | Unit Price | Total Value of Item (\$) |
|--------------------------------|--|--------------------------|--------------|-------------------|-------------------------------------|
| 11g | Ledge and Boulder Excavation | 5 | CY | | |
| 11h | Pre-blast Survey | 5 | EA | | |
| 12a | Erosion and Sediment Control Plan | 1 | LS | | |
| 12b | Hay Bales | 50 | EA | | |
| 12c | Siltation Fence | 300 | LF | | |
| 12d | Heavy Duty Siltation Fence / Straw Hay Bale | 100 | LF | | |
| 12e | Inlet Protection | 5 | EA | | |
| 12f | Erosion Control Mulch | 40 | CY | | |
| 12g | Erosion Control Blanket | 100 | SY | | |
| 12h | Erosion Control Stone | 40 | CY | | |
| 12i | Erosion Control Sock | 300 | LF | | |
| 12j | Erosion Control Seeding | 100 | SY | | |
| 13a | Loaming & Seeding | 200 | SY | | |
| 13b | Private Property Landscaping Directed by the Owner | 1 | Allowance | \$7,500 | \$7,500 |
| 13c | Tree Removal, < 4" Caliper as Directed | 2 | EA | | |
| 13d | Tree Removal, > 4" Caliper as Directed | 2 | EA | | |
| 13e | Removal and Disposal of Temporary Driveways and Temporary Widening | 50 | CY | | |
| 14a | Hot Bituminous Pavement, Hand Method | 25 | TON | | |
| 14b | Hot Bituminous Pavement, Machine Method | 120 | TON | | |
| 14c | Driveway and Aprons | 25 | TON | | |

| PART A Bid Item No. | Description | Item Quantity | Units | Unit Price | Total Value of Item (\$) |
|----------------------------|---|----------------------|--------------|-------------------|---------------------------------|
| 14d | Asphalt Cement Adjustment | 1 | Allowance | \$10,000 | \$10,000 |
| 15 | Cold Planing (1" to 2" depth) | 250 | SY | | |
| 16 | Uniformed Officers | 1 | Allowance | \$10,000 | \$10,000 |
| 17 | Flaggers | 200 | Hours | | |
| 18 | Traffic Control Plan and Maintenance of Traffic – City ROW and Private Property | 1 | LS | | |
| 19a | Hazardous Soils and Materials Testing | 1 | Allowance | \$10,000 | \$10,000 |
| 19b | Hazardous Soils and Materials Disposal | 1 | Allowance | \$25,000 | \$25,000 |
| 19c | Handling/Treatment/Disposal of Contaminated Water | 1 | Allowance | \$5,000 | \$5,000 |
| 20 | Field Office | 5 | Month | | |
| 21 | As-Built Survey | 1 | LS | | |
| 22 | Mobilization (not to exceed 5% of total of all other items) | 1 | LS | | |
| | Total Part A | \$ | | | |

The basis of award will be the lowest responsible bidder for the Total Part A.

ARTICLE 6 – TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete on or before **October 1, 2017**, and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **November 1, 2017**.
- 6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. List of Proposed Subcontractors;
- C. List of Proposed Suppliers;
- D. List of Project References;
- E. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids; and
- F. Required Bidder Qualification Statement with supporting data.

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

Bid Submittal

BIDDER: *[Indicate correct name of bidding entity]*

By:

[Signature]

[Printed name]

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

[Signature]

[Printed name]

Title:

Submittal Date:

Address for giving notices:

Telephone Number:

Fax Number:

Contact Name and e-mail address:

Required Bidder Qualification Statement

The Bidder shall state below what works of a similar character to that of the proposed contract he has performed, and provide such references as will enable the Owner to judge his experience, skill, and business standing.

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, add separate sheets.

1. Name of Bidder.
2. Permanent Main Office address.
3. When organized?
4. Where incorporated?
5. Is bidder registered with the Secretary of the State to do business in New Hampshire?
6. For how many years has your firm engaged in the contracting business under its present name?
Also state names and dates of previous firm names, if any.
7. Contracts on hand. (Schedule these, showing gross amount of each contract and the approximate anticipated dates of completion.)
8. General character of work performed by your company.
9. Have you ever failed to complete any work awarded you in the scheduled contract time, including approved time extensions? ☐ (Yes) ☐ (No).
If so, where and why?
10. Have you ever defaulted on a contract? ☐ (Yes) ☐ (No).
If so, where and why?
11. Have you ever had liquidated damages assessed on a contract? ☐ (Yes) ☐ (No).
If so, where and why?

- [illegible]

- | Project Name | Location | Date Completed | Owner | Reference Name, Affiliation and Contact Info. |
|--------------|----------|----------------|-------|---|
| | | | | |
| | | | | |
| | | | | |

- | Project Name | Location | Date Completed | Owner | Reference Name, Affiliation and Contact Info. |
|--------------|----------|----------------|-------|---|
| | | | | |
| | | | | |
| | | | | |

- c. List Projects including casing pipe installation using trenchless methods, e.g., including jack and bore, horizontal directional drilling, and micro-tunneling.

| Project Name | Location | Date Completed | Owner | Reference Name, Affiliation and Contact Info. |
|--------------|----------|----------------|-------|---|
| | | | | |
| | | | | |
| | | | | |

- d. List Projects requiring NHDOT Bureau of Turnpikes Encroachment Permit.

| Project Name | Location | Date Completed | Owner | Reference Name, Affiliation and Contact Info. |
|--------------|----------|----------------|-------|---|
| | | | | |
| | | | | |
| | | | | |

13. List your major equipment available for this contract.

14. List your key personnel such as Project Superintendent and foreman available for this contract. Identify total years of experience on similar projects.

15. List any subcontractors whom you would expect to use for the following (unless this work is to be done by your own organization):

- a. Surveying _____
- b. Civil/Geotechnical Engineering _____
- c. Paving _____
- d. Casing Pipe Installation _____
- e. Grouting _____
- f. Other work _____

16. With what banks and bonding/surety companies do you conduct business?

Bank: _____

Bank Reference Name: _____

Bank Reference Phone Number: _____

Bonding/Surety Company: _____

Bonding/Surety Company Reference Name: _____

Bonding/Surety Company Phone Number: _____

Do you grant the Engineer permission to contact this (these) institutions? ___(Yes) ___(No)

NOTE: Bidders may be required to furnish their latest financial statement as part of the award process.

Respectfully submitted:

| | |
|--------------------|------------------|
| _____ Signature | _____ Address |
| _____ Title | _____ Date |

Being duly sworn, deposes and says that he is

_____ of _____
(Name of Organization)

and that the answers to the foregoing questions and all statements contained therein are true and correct.

Sworn to before me this _____ day of _____, 20 _____

Notary Public

My commission expires _____

(Seal - If BID is by Corporation)

ATTEST: _____

SECTION 01010

SUMMARY OF WORK

1.0 GENERAL

The work covered under this contract will be performed in the areas of the Railroad Avenue, Spaulding Turnpike Crossing, and Birch Drive in the City of Rochester, NH.

2.0 DESCRIPTION OF PROJECT

The Colonial Pines Sewer – Spaulding Turnpike Crossing project will consist of the following work:

- Verification of existing utility locations
- Condition Surveys and Vibration Monitoring
- Soils Testing for Soil Stabilization Grouting Plan
- Detailed Soil Stabilization Grouting Plan
- Apply for and Obtain Spaulding Turnpike Crossing Encroachment Permit
- Preparing and implementing a Traffic Control Plan
- Preparing and implementing an Erosion and Sediment Control Plan
- Furnishing and maintaining Temporary Facilities and Controls
- Installing Temporary Water Mains, Hydrants and Services and Maintaining water service to customers during construction
- Replacement and relocation of existing water mains, valves, hydrant assemblies
- Abandonment in place and removal and disposal of existing utilities
- Installation of casing pipe beneath Spaulding Turnpike
- Installation of new sewer
- Post-Construction Clean & CCTV of Casing Pipe and Sewer
- Roadway and surface restoration
- All ancillary work necessary to complete the project.

END OF SECTION

SECTION 01014

WORK SEQUENCE

1.0 VERIFICATION OF EXISTING UTILITIES PRIOR TO ANY WORK

A. GENERAL:

The locations and elevations of the existing gas, water main and storm drain shall be verified prior to any work.

The Contractor shall coordinate the work to avoid any interference with normal operation of utilities in the area.

2.0 COORDINATION WITH NHDOT AND UNITIL:

The Contractor shall Coordinate all Work and Schedules with NHDOT and Unitil.

3.0 SPAULDING TURNPIKE CROSSING

A. SUGGESTED WORK SEQUENCE:

Perform verification of soils conditions and soils testing.

Prepare detailed soil stabilization grouting plan.

Prepare, apply for and obtain permits and approvals prior to submitting shop drawings to the Engineer for review.

Furnish and install and maintain sediment and erosion controls.

Provide temporary facilities and controls.

Prepare and implement approved Traffic Control Plan.

Provide temporary water mains, hydrants and services, connections and chlorination.

The existing water main shall be taken out of service, new main and connections made, hydrant assemblies relocated and installed prior to excavating for jacking/receiving pits. Temporary hydrants shall be furnished and installed until permanent hydrants are installed and accepted.

Implement monitoring systems for Unitil gas main and Spaulding Turnpike Right of Way.

Install excavation support and dewatering systems. Provide soil stabilization measures and groundwater control measures.

Install jacking/receiving pits and associated equipment.

Install casing pipe and clean, CCTV and survey.

Install carrier pipe and clean, CCTV and survey.

Fill casing pipe, cut off sheeting and backfill.

Remove Temporary Facilities and Controls, and erosion and sediment control measures.

Complete surface restoration and cleanup.

Fully cooperate with the Owner, coordinate the construction schedule with the Owner and Engineer. The Owner and Engineer reserve the right to modify or expand the schedule during construction to meet prevailing conditions.

4.0 SUBMITTAL:

A. GENERAL:

In accordance with Section 01310, the Contractor shall submit a detailed schedule for review.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

1.0 MEASUREMENT AND PAYMENT

A. GENERAL:

Measurements of the completed Work shall be in accordance with, and by instruments and devices calibrated to United States Standard Measures and the units of measurement for payment, and the limits thereof, shall be made as shown on the Plans, Specifications, General Requirements, and Supplementary Conditions.

B. UNITS OF MEASUREMENT:

Measurements shall be in accordance with U.S. Standard Measures. A pound is an avoirdupois pound. A ton is 2,000 pounds avoirdupois. The unit of liquid measure is the U.S. gallon.

C. CERTIFIED WEIGHTS:

When payment is to be made on the basis of weight, the weighing shall be done on certified platform scales, or when approved by the Engineer, on a completely automated weighing and recording system. The Contractor shall furnish the Engineer with duplicate licensed weighmaster's certificates showing the actual net weights. The OWNER will accept the certificates as evidence of the weights delivered.

D. METHODS OF MEASUREMENT:

Materials and items of work, which are to be paid for on the basis of measurement, shall be measured in accordance with the method stipulated in the particular sections involved. In determining quantities, all measurements shall be made in a horizontal plane unless otherwise specified.

Material not used from a transporting vehicle shall be determined by the Engineer and deducted from the certified tag.

When material is to be measured and paid for on a volume basis and it would be impractical to determine the volume, or when requested by the Contractor in writing and approved by the Engineer in writing, the material will be weighed and converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities will be adopted.

Full compensation for all expense involved in conforming to the above requirements for measuring and weighing materials shall be considered as included in the unit prices paid for the materials being measured or weighed and no additional allowances will be made thereof.

Quantities of material wasted or disposed of in a manner not called for under the Contract; or rejected loads of material, including material rejected after it has been placed by

reason of failure of the Contractor to conform to the provisions of the Contract; or material not unloaded from the transporting vehicle; or material placed outside the lines indicated on the plans or given by the Engineer; or material remaining on hand after completion of the Contract, will not be paid for and such quantities will be deducted from the final total quantities. No compensation will be allowed for hauling rejected material.

2.0 BID ITEMS

The Bid amounts will also form the basis of monthly progress payments. Each Lump Sum bid amount will undergo further breakdown as described later in this section. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in the pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified.

The payment under the following items shall constitute full compensation for performing all work necessary as indicated on the contract drawings and as specified herein, and shall include all materials and labor, including but not limited to, the following:

Bid Item 1a. Remove & Dispose Existing Pipe (water or other utility) Outside Trench Limits as Directed (LF)

- A. The length of existing water, sewer, drain or gas pipe to be paid for under the appropriate subdivision of this item shall be measured by the linear foot along the pipe removed and disposed.
- B. The unit price under the appropriate subdivision of this item shall constitute full compensation for removing and disposal of pipe off-site at an approved facility in accordance with local, state and federal requirements, including, monitoring, testing, containment, transport, tipping fees, chain-of custody/bill of lading documentation, certifications, and all incidental work.

Bid Item 1b. Remove & Dispose Existing 6"/8" Water Main Within Trench Limits (LF)

- A. The length of existing water pipe to be paid for under the appropriate subdivision of this item shall be measured by the linear foot along the existing pipe removed and disposed.
- B. The unit price under the appropriate subdivision of this item shall constitute full compensation for removing and disposal of pipe off-site at an approved facility in accordance with local, state and federal requirements and shall include excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls, and all incidental work.

Bid Item 1c. Plug and Abandon Existing 6" Water Main in Place Using Flowable Fill (LF)

- A. Plug and Abandon Existing Utility in Place using Flowable Fill shall be measured per linear foot as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for plugging existing utilities, installing flowable fill access points, installing flowable fill, excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls, and all other items considered incidental.
- C. Payment for Flowable Fill will be made separately.

Bid Item 2a. Soils Testing for Soil Stabilization Grouting Plan (LS)

- A. Soils Testing shall be measured on a percent complete basis as approved by the Engineer.
- B. Payment shall be based on actual completion amount based on the approved Schedule of Values for this item.

Bid Item 2b. Detailed Soil Stabilization Grouting Plan (LS)

- A. Detailed Soil Stabilization Grouting Plan shall be measured on a lump sum basis as approved by the Engineer.
- B. Payment shall be made following completion of the Detailed Soil Stabilization Plan as approved by the Engineer.

Bid Item 2c. Soil Stabilization Grouting (Allowance)

- A. Soil Stabilization Grouting shall be measured for payment based on actual costs for Soil Stabilization Grouting as approved by the Engineer. Documentation of actual costs shall be submitted for labor, materials and equipment and shall be submitted in accordance with the approved schedule of values.
- B. Payment shall be based on actual costs as approved by the Engineer.
- C. No markup of soil stabilization grouting subcontractor costs or expenses will be allowed.
- D. Contractor costs for subcontractor coordination, scheduling and incidental work shall be incidental to the project and shall not be separately measured for payment.

Bid Item 2d. Spaulding Turnpike Crossing (LS)

- A. Spaulding Turnpike Crossing shall be measured on a percent complete basis as approved by the Engineer.

- B. The lump sum price for this item shall constitute full compensation for obtaining all necessary permit and approvals, designing, furnishing and installing the jacking/access pits, casing pipe and fittings, grade adjusting casing spacers for carrier pipe installation, scheduling and coordination of soil stabilization grouting, excavation, backfill, compaction, temporary excavation support, dewatering, dewatering treatment, proper disposal of all excavated materials off-site, monitoring of installation using approved methods, compliance with Unitil requirements, compliance with requirements and provisions included in the Draft Turnpike Encroachment Permit, meetings and coordination with the Owner and Utility Companies and all other items considered incidental to the work described above within the limits from Contractor's Jacking/Access Pits and specified herein.
- C. Sewer manholes and sewer carrier pipe will be separately measured for payment under the appropriate bid item.
- D. Condition Surveys and Vibration Monitoring, Traffic Controls, and New Hampshire State Police Details as required and specified by NHDOT will be separately be measured for payment under the appropriate bid item.
- E. Sheet piling and Bracing Left in Place shall be separately measured for payment under the appropriate bid item.

Bid Item 2e. Obstruction Removal – 1 CF or Larger (CF)

- A. Obstruction Removal for casing pipe installation associated with the Spaulding Turnpike Crossing shall be measured on a cubic foot basis for obstructions greater than 1 cubic foot in size as approved by the Engineer.
- B. Payment shall be based on actual cubic feet at approved by the Engineer.
- C. Payment for rock excavation associated with jacking and receiving pit construction and trenches shall be separately measured for payment.

Bid Item 2f. Spaulding Turnpike Crossing Steel Sheet Piling Left in Place (Allowance)

- A. Spaulding Turnpike Crossing Steel Sheet Piling Left in Place will be measured for payment by the **square foot** of steel sheet piling left in place as approved and measured by the Engineer.
- B. Payment for Spaulding Turnpike Crossing Steel Sheet Piling Left in Place **will be made in the amount of \$35 per square foot for each approved square foot left in place.**
- C. Payment for Spaulding Turnpike Crossing Steel Sheet Piling Left in Place shall constitute full compensation for furnishing and installing steel sheet piling systems complete in place including connections, bracing, supports, etc. and leaving in place to prevent disturbance of soils and structures and for future access by the Owner.

Bid Item 2g. Condition Surveys and Vibration Monitoring – Section 02302 (LS)

- A. Condition Surveys and Monitoring as specified in Section 02302 shall be measured on a percent complete basis as approved by the Engineer.
- B. Payment shall be based on a percent complete basis as approved by the Engineer.

Bid Item 2h. Condition Surveys and Vibration Monitoring – Encroachment Permit Required (Allowance)

- A. Condition Surveys and Vibration Monitoring required by NHDOT shall be measured on a percent complete basis as approved by the Engineer.
- B. Contractor shall submit invoices for work for review and approval by the Engineer.
- C. Payment shall be based on actual costs for expenses as approved by the Engineer. No markup will be allowed.
- D. Costs shall not exceed the allowance amount without prior approval from the Engineer.

Bid Item 2i. Traffic Control Plan – Encroachment Permit Required (Allowance)

- A. Preparation and Implementation of a Traffic Control Plan required by NHDOT shall be measured on a percent complete basis as approved by the Engineer.
- B. Contractor shall submit invoices for work for review and approval by the Engineer.
- C. Payment shall be based on actual costs for expenses as approved by the Engineer. No markup will be allowed.
- D. Costs shall not exceed the allowance amount without prior approval from the Engineer.

Bid Item 2j. State Police Details – Encroachment Permit Required (Allowance)

- A. Measurement for State Police Details shall be actual costs as included on invoices as approved by the Engineer.
- B. Payment shall be based on actual invoiced amount for State Police Details as approved by the Engineer. No markup will be allowed.

Bid Item 2k. Spaulding Turnpike Crossing Surety Bond (LS)

- A. Spaulding Crossing Surety Bond shall be measured on a lump sum basis following furnishing an acceptable and approved Surety Bond to NHDOT for the

value of the completion of all Work to install the Spaulding Turnpike Crossing and including SMH#24 and SMH#27 and sheeting left in place.

- B. The lump sum price for this item shall constitute full compensation for furnishing a Surety Bond in accordance with NHDOT requirements and the Turnpike Encroachment Permit issued for the Work.

Bid Item 3a. 12" Ductile Iron Sewer (LF)

- A. Sewers shall be measured per liner foot of pipe installed as approved by the Engineer.
- B. The unit price shall constitute full compensation for furnishing and installing the pipe, fittings, gaskets, restrained joints, excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, stone bedding, testing, traffic controls, removal and proper disposal of the existing replaced structures off-site, and all other items considered incidental to the installation complete in-place as indicated on the drawings and as specified herein.

Bid Item 4a. 5' Dia. Precast Concrete Sewer Manhole Base Unit (EA)

- A. Manhole Base Units shall be measured per each installed.
- B. The unit price shall constitute full compensation for furnishing and installing the pre-cast concrete manhole base unit including excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, stone bedding, connection of sewers, invert channels, steps, gaskets, sealants, testing, traffic controls, removal and proper disposal of the existing replaced structures off-site, and all other items considered incidental to the installation of the manhole complete in-place as indicated on the drawings and as specified herein.

Bid Item 4b. 5' Dia. Precast Concrete Sewer Manhole Walls/Cones (VF)

- A. Manhole Walls/Cones shall be measured per vertical foot installed.
- B. The unit price shall constitute full compensation for furnishing and installing pre-cast concrete manhole walls/cones including excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, stone bedding, connection of sewers, invert channels, steps, gaskets, sealants, testing, traffic controls, removal and proper disposal of the existing replaced structures off-site, and all other items considered incidental to the installation of the manhole walls/cones complete in-place as indicated on the drawings and as specified herein.

Bid Item 4c. Sewer Manhole Frame & Cover (EA)

- A. Sewer manhole frames and covers shall be measured per each installed complete and in-place.

- B. The unit price for this item shall constitute full compensation for installation of frames and covers complete in-place as indicated on the drawings and as specified herein.

Bid Item 5a. 6" Water Main (LF)

- A. Water main shall be measured by the linear foot along the completed main, including all fittings.
- B. The unit prices under the appropriate subdivision of this item shall constitute full compensation for constructing the water main complete and in-place, as indicated on the drawings and as specified herein, including but not limited to, removal and proper disposal of the existing abandoned section of main, furnishing and installing all pipe and fittings, connection to existing mains and hydrants, trench excavation and backfill, compaction, temporary excavation support, proper disposal of all unsuitable and surplus excavated materials off-site, thrust restraint, testing and disinfection of pipe, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 5b. Additional Fittings (LB)

- A. Additional fittings, not shown on the drawings and where ordered by the Engineer, shall be measured per pound.
- B. The unit price for this item shall constitute full compensation for installation of fittings, including restrained joints and thrust blocks.

Bid Item 6a. Hydrant Assembly – End of Birch Drive (EA)

Bid Item 6b. Transfer Hydrant to 24-inch Water Main – End of Railroad Avenue (EA)

- A. Hydrant assemblies shall be measured per assembly installed as approved by the Engineer.
- B. Payment shall constitute full compensation for installing hydrant assemblies, tee, valve and box, ductile iron pipe including fittings, bends, restraints, thrust blocks, excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, thrust restraint, testing and disinfection of pipe, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 7a. 6" Gate Valve & Box (EA)

- A. Measurement for gate valves and boxes shall be measured per assembly installed as approved by the Engineer.
- B. Payment shall constitute full compensation for installing valve and box, including fittings, bends, restraints, thrust blocks, excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, thrust restraint, testing and disinfection of

pipe, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 7b. 24" x 6" Tapping Sleeve and Valve (EA)

- A. Measurement for tapping sleeves and gate valves and boxes shall be measured per assembly installed as approved by the Engineer.
- B. Payment shall constitute full compensation for installing tapping sleeve and valve and box, including fittings, bends, restraints, thrust blocks, excavation and backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, thrust restraint, testing and disinfection of pipe, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 8a. Connect to Existing Water Main – Railroad Avenue (LS)

Bid Item 8b. Connect to Existing Water Main – Birch Drive (LS)

- A. Measurement for connections to existing mains shall be per connection.
- B. The unit price for this item shall constitute full compensation for connecting to existing water mains as indicated on the drawings and as specified herein, including temporary connection, disinfection, flushing, couplings, joint restraints, thrust blocks, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 9. Temporary Water Main, Including Services & Hydrants (LF)

- A. Temporary water main shall be measured on a per linear foot basis along the street centerline as approved by the Engineer.
- B. Mains, branches, and services shall not be separately measured for payment.
- C. The unit price for this item per linear foot of street shall constitute full compensation for installation of temporary water system to provide uninterrupted domestic water services, connections, valves, and temporary hydrants for the full duration that the existing water main is taken out of service until the new main is installed, tested, and new services installed in accordance with the specifications and upon final approval by the Engineer.
- D. Payment shall constitute full compensation for excavation, backfill, mains, branches, services, installing temporary driveway entrances, complying with City requirements, testing, flushing, chlorination, dechlorination, maintenance, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 10a. Exploratory Excavation at Existing Utilities (CY)

Bid Item 10b. Exploratory Excavation Ordered by the Engineer (CY)

Bid Item 10c. Vacuum Exploratory Excavation Ordered by the Engineer (CY)

- A. Exploratory Excavation and Vacuum Exploratory Excavation where noted on the Drawings or as ordered by the Engineer and not incidental to construction shall be measured per cubic yard excavated.
- B. Excavation shall be paid at the unit price item and shall constitute full compensation to investigate existing subsurface conditions in order to perform the necessary work without damage or interruption to existing structures or utilities. The work for this item shall include all excavation including hand-digging, backfill, compaction, temporary bituminous pavement repair, surface restoration, and all other items considered incidental to the excavation and restoration of exploratory excavation.

Bid Item 10d. Post-Construction Clean & CCTV New Casing Pipe - Spaulding Turnpike (LF)

Bid Item 10e. Post-Construction Clean & CCTV New Sewer (LF)

- A. Clean & CCTV as ordered by the Engineer and not incidental to construction shall be measured per linear foot as approved by the Engineer.
- B. Clean & CCTV shall be paid at the unit price item and shall constitute full compensation to investigate existing pre-construction conditions in order to perform the necessary work without damage or interruption to existing structures or utilities and to confirm post-construction conditions. The work for this item shall include all work necessary for cleaning and inspection the full interior of the sewer during flow bypass operations, PACP reports, traffic control, and all other items considered incidental.

Bid Item 11a. Additional Excavation and Removal & Replacement with Suitable Material (CY)

- A. Measurement shall be per cubic yard as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for additional excavation to adjust utilities to an invert elevation greater than 1 foot shown on the drawings, removal of material, additional backfill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 11b. Removal & Replacement of Unsuitable Backfill (CY)

- A. Measurement shall be per cubic yard as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for excavation of unsuitable material and backfill with structural fill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 11c. Gravel Base Course (CY)**Bid Item 11d. Crushed Gravel Base Course (CY)**

- A. Measurement for gravel base course and crushed gravel base course for roadway subgrade remaining in place shall be by cubic yard as measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for placement, compaction, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 11e. Additional Crushed Stone (CY)

- A. Measurement for additional crushed stone shall be by cubic yard as ordered and measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for placement, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 11f. Flowable Fill (CY)

- A. Measurement for flowable fill shall be by cubic yard as approved and measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for placement, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items.

Bid Item 11g. Ledge and Boulder Excavation (CY)

- A. Measurement for ledge and boulder excavation and boulders greater than 1 ft³ shall be by cubic yard as measured and approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for ledge excavation, replacement with structural fill, compaction, temporary excavation support, dewatering, proper disposal of all unsuitable and surplus excavated materials off-site, traffic controls as specified, and all other items incidental thereto and not specifically included for payment under other items. Payment shall also include compensation for coordinating pre-blast surveys, permits and complying with local, state and federal requirements.
- C. The Contractor shall anticipate ledge and boulder removal will be required for utility and pump station installation throughout the project area and no additional payment or compensation will be made for work stoppages to conduct pre-blast surveys or for complying with requirements for ledge and boulder removal.

- D. Boulders and cobbles removed during casing pipe installation greater than 1 cubic foot will be separately measured for payment.

Bid Item 11h. Pre-blast Survey (EA)

- A. Pre-blast surveys shall be measured per survey as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for conducted Pre-blast survey as approved by the Engineer.
- C. The Contractor shall anticipate ledge and boulder removal will be required for utility and pump station installation throughout the project area and no additional payment or compensation will be paid for work stoppages to conduct pre-blast surveys or for complying with requirements for ledge and boulder removal.

Bid Item 12a. Erosion and Sediment Control Plan (LS)

- A. Preparing an approved Erosion and Sediment Control Plan, monitoring and maintenance of erosion and sediment controls shall be measured on a lump sum basis as approved by the Engineer.
- B. The lump sum price for this item shall constitute full compensation for preparing and implementing an approved erosion and sediment control plan.

Bid Item 12b. Hay Bales (EA)

- A. Hay Bales shall be measured on a per each basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for furnishing and installing Hay Bales, including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12c. Siltation Fence (LF)

- A. Siltation Fence shall be measured on a per linear foot basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for furnishing and installing Siltation Fence, including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12d. Heavy Duty Siltation Fence / Straw Hay Bale (LF)

- A. Heavy Duty Siltation Fence / Straw hay Bale shall be measured on a per linear foot basis as approved by the Engineer
- B. The unit price for this item shall constitute full compensation for furnishing and installing Heavy Duty Siltation Fence / Straw Hay Bale, including monitoring,

maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12e. Inlet Protection (EA)

- A. Inlet Protection shall be measured on a per each basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for installing Inlet Protection including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12f. Erosion Control Mulch (CY)

- A. Erosion Control Mulch shall be measured on a cubic yard basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for furnishing and installing Erosion Control mulch including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12g. Erosion Control Blanket (SY)

- A. Erosion Control Blanket shall be measured on a square yard basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for furnishing and installing Erosion Control Blanket including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12h. Erosion Control Stone (CY)

- A. Erosion Control Stone shall be measured on a cubic yard basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for furnishing Erosion Control Stone including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12i. Erosion Control Sock (LF)

- A. Erosion Control Socks shall be measured on a linear foot basis as approved by the Engineer.

- B. The unit price for this item shall constitute full compensation for furnishing and installing Erosion Control Socks including monitoring, maintenance and replacement (if necessary) throughout the project, and removal and disposal at completion of the Work.

Bid Item 12j. Erosion Control Seeding (SY)

- A. Erosion Control Seeding shall be measured for payment on a square yard basis completed as approved and measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for seeding including monitoring, maintenance and replacement (if necessary) throughout the project.

Bid Item 13a. Loaming & Seeding (SY)

- A. Loaming and seeding shall be measured for payment on a square yard basis completed as defined in the specifications and as measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for loaming and seeding including monitoring, maintenance and replacement (if necessary) throughout the project.

Bid Item 13b. Private Property Landscaping Directed by Owner (Allowance)

- A. Residential Landscaping Directed by the Owner shall be measured for payment based on pre-approved costs with 10% markup as measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for residential landscaping including monitoring, maintenance and replacement (if necessary) throughout the project.

Bid Item 13c. Tree Removal, < 4" Caliper as Directed (EA)

Bid Item 13d. Tree Removal, > 4" Caliper as Directed (EA)

- A. Residential Landscaping Directed by the Owner shall be measured for payment based on pre-approved costs with 10% markup as measured by the Engineer.
- B. The unit price for this item shall constitute full compensation for residential landscaping including monitoring, maintenance and replacement (if necessary) throughout the project.

Bid Item 13e. Removal and Disposal of Temporary Driveways and Temporary Widening (CY)

- A. Removal and disposal shall be measured for payment on a cubic yard basis as measured and approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for removal and off-site disposal of gravels, crushed stone and pavement installed for Contractor's operations.

- C. Surface restoration in locations of temporary driveways and temporary widening areas shall be separately measured for payment.

Bid Item 14a. Hot Bituminous Pavement, Hand Method (TON)

Bid Item 14b. Hot Bituminous Pavement, Machine Method (TON)

Bid Item 14c. Driveway and Aprons (TON)

- A. Pavement shall be measured for payment on a per ton basis installed and completed as defined in the specifications and approved by the Engineer. Measurement shall be based on the actual tonnage of bituminous concrete placed to the defined limit as indicated on the drawings and as directed by the Engineer.
- B. Bituminous concrete binder course and top course pavement shall be paid for per the ton of pavement placed and compacted complete and in place, to the full depth as indicated on the drawings and as specified herein.
- C. The unit price for this item shall constitute full compensation for placement and compaction of pavement by hand or mechanical means.
- D. The unit price for this item shall constitute full compensation for removal and disposal of existing pavement, grading, compaction, and all incidental work.

Bid Item 14d. Asphalt Cement Adjustment (ALLOWANCE)

- A. Bid items involving asphalt concrete mixtures containing asphalt cement may be subject to a price adjustment. Only the asphalt portion of asphalt-rubber cement will be eligible for price adjustment. The adjustment will take effect when the monthly price for asphalt cement as furnished by the Bureau of Materials and Research differs from the base price contained in effect at the time of the bid. Affected Sections and formulas are detailed below.

The base price* of asphalt cement for this Contract is per ton during the month and year of the bid opening. (* Source: The base price is developed from data published in the Asphalt Weekly Monitor, a publication from Poten and Partners, Inc. The monthly price of asphalt cement will be established by the Bureau of Materials and Research on the first business day following the 14th calendar day of each month.)

- B. The contract prices of bituminous materials will be paid under the respective items in the contract. The price adjustment, as provided herein, upwards or downwards, will be made at the end of each month in which the work was accomplished as follows:

The price adjustment will be based on the percent of virgin asphalt cement stated in the Approved Mix Design containing the maximum percentage of reclaimed asphalt pavement. In the event of breakdown or unforeseen circumstances other than weather, an Approved Virgin Mix Design may be used. The price adjustment will then be based on the total percent of virgin asphalt cement in that approved design. A contract adjustment will be made based on; [monthly price minus the base price] X [Approved Mix Design percent of virgin asphalt cement] X [tons of pavement used].

Bid Item 15. Cold Planing (1" to 2" depth) (SY)

- A. Cold Planing shall be measured on a square yard basis as approved by the Engineer.
- B. The unit price for this item shall constitute full compensation for removal of pavement to depth as directed by the Engineer, including off-site disposal of asphalt.

Bid Item 16. Uniformed Officers (ALLOWANCE)

- A. Uniformed officers used for traffic control shall be measured for payment as approved by the Engineer.
- B. Payment under this item shall include Contractor coordination with traffic control officers, administration and payment of invoices, documenting uniformed officers on site, and providing copies of invoices and supporting documentation.
- C. New Hampshire State Police Details will be separately measured for payment.

Bid Item 17. Flaggers (Hour)

- A. Flaggers used for traffic control shall be measured for payment as approved by the Engineer.
- B. Payment under this item shall include Contractor coordination with flaggers, administration and payment of invoices, documenting flaggers on site, and providing copies of invoices and supporting documentation.
- C. Flaggers provided that are not in accordance with an approved traffic control plan or not approved by the Engineer will not be measured for payment. Costs for unapproved Flaggers shall be borne by the Contractor.
- D. The use of Flaggers will not be allowed in the Spaulding Turnpike Right-of-Way.

Bid Item 18. Traffic Control Plan and Maintenance of Traffic – City ROW and Private Property (LS)

- A. Traffic Control Plan shall be measured for payment as approved by the Engineer.
- B. Payment for this item shall include maintenance of work zones, coordination with local authorities, DPW, school department, trash removal, mail and delivery services, barriers, signage, and ancillary traffic control devices. Payment shall include Contractor preparation, submittal, revising and updating, and implementing Contractor's plan throughout the duration of the Project until Final Completion.
- C. Progress payments shall be made based on work completed as approved by the Engineer.

- D. Traffic Control Plan and Maintenance of Traffic for Spaulding Turnpike shall be included in Bid Item 2a.

Bid Item 19a. Hazardous Soils and Materials Testing (ALLOWANCE)

- A. Soils and Materials Testing by an approved third party shall be measured for payment based on actual costs as approved by the Engineer.
- B. Payment for this item shall constitute full compensation for all work for testing services for the project including coordination, scheduling, and all incidental work. Payment shall be based on actual invoices paid by the Contractor. No markup shall be allowed.

Bid Item 19b. Hazardous Soils and Materials Disposal (ALLOWANCE)

- A. Handling/Treatment/Disposal of Contaminated Soils and Materials by an approved third party shall be measured for payment based on actual costs as approved by the Engineer.
- B. Payment for this item shall constitute full compensation for all work for testing services, handling, treatment, and disposal of contaminated water and soil in accordance with local, state and federal requirements. Payment shall be based on actual invoices paid by the Contractor. No markup shall be allowed.

Bid Item 19c. Handling/Treatment/Disposal of Contaminated Water (ALLOWANCE)

- A. Handling/Treatment/Disposal of Contaminated Water by an approved third party shall be measured for payment based on actual costs as approved by the Engineer.
- B. Payment for this item shall constitute full compensation for all work for testing services, handling, treatment, and disposal of contaminated water in accordance with local, state and federal requirements. Payment shall be based on actual invoices paid by the Contractor. No markup shall be allowed.

Bid Item 20. Field Office (Month)

- A. Field Office shall be measured for payment on a per month basis as approved by the Engineer.
- B. Payment for this item shall include providing field office and appurtenances, temporary facilities, maintenance, cleaning and trash removal, and incidental work.
- C. Progress payments shall be made based on work completed as approved by the Engineer.

Bid Item 21. As-Built Survey (LS)

- A. As-Built Survey shall be measured for payment on a lump sum basis as approved by the Engineer.
- B. Payment shall be full compensation for furnishing Professional Land Survey services, survey data as specified, and all work necessary to comply with City of Rochester requirements.

Bid Item 22. Mobilization (not to exceed 5% of total of all other items) (LS)

- A. Mobilization shall be measured on a percent complete basis as measured by the Engineer.
- B. Mobilization shall be paid for on a percent complete lump sum basis.
- C. The total amount bid for mobilization shall not exceed five percent (5%) of the total bid amount sum of all bid items excluding this item.
- D. Retainage in the amount of 75% of this item shall be withheld until the Contractor's SWPPP has been approved and a Field Office has been furnished and installed.

No separate payment shall be made for any item that is not specifically specified in the Bid Form, wherein all costs incurred for the construction of this project as indicated on the drawings and as specified herein shall therefore be inclusive in the appropriate Bid Items prices.

3.0 CONTRACTORS COST BREAKDOWN

For work to be performed for a lump sum amount, the Contractor shall submit a cost breakdown to the Engineer prior to the first payment and within ten (10) days after Notice to Proceed. **Refer to Section 01370 SCHEDULE OF VALUES.** The cost breakdown, as agreed upon by the Contractor and the Engineer, shall be used for preparing future estimates for partial payments to the Contractor, and shall list the major items of work with a price fairly apportioned to each item. Mobilization, overhead, bond, insurance, other general costs and profit shall be prorated to each item so that the total of the prices for all items equal the lump sum price. At the discretion of the Engineer, mobilization, bond and insurance costs may be provided for separately if accompanied by invoices to verify actual expenses.

The cost breakdown shall be generally in the same format as the Contract specifications divisions and subdivisions, with major items of work listed individually. The cost breakdown shall be by structure, civil, landscaping, or other logical division of work. The cost breakdown for architectural, structural, mechanical, and electrical work shall include separate items for identifiable portions of the structures. The cost breakdown shall include separate allowances for any testing and startup work required. Measurable approximate quantities of work performed by the Contractor or its subcontractors shall be provided. For quantities that are the sum total of several individual quantities, backup summaries shall be provided which list the individual descriptions and quantities. These summaries then will be used to determine the quantities of work in place in subsequent progress payment requests.

The above is a statement of the intent of the Contract Documents to provide a moderate level of detail, acceptable to the Engineer, to allow a fair and reasonable estimate to be made of the value of work installed. The detail of the cost breakdown must be sufficient to provide timely processing of the monthly progress payment request.

The cost breakdown will be subject to the approval of the Engineer, and upon request, the Contractor shall substantiate the price for any or all items and provide additional level of detail, including quantities of work. The cost breakdown shall be sufficiently detailed to permit its use by the Engineer as one of the bases for evaluating requests for payments. The Engineer shall be the sole judge of the adequacy of the cost breakdown.

The cost breakdown shall be solely used to determine progress payments. The cost breakdown shall not be considered in determining payment or credit for additional or deleted work.

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES

PART 1 – GENERAL

1.01 SCOPE

Contractor shall submit to the Engineer a Schedule of Values to be used in the preparation of the cost-weighted CPM schedule allocated to the various portions of the Work, within 21 days after the effective date of the agreement. The Engineer may request supporting documentation upon review to substantiate the correctness of the values therein. The accepted schedule of values along with the cost-weighted CPM schedule shall be used as the basis for the Contractor's Applications for Payment. No progress payments will be made by the Owner until the schedule of values is accepted and approved by the Engineer.

1.02 FORM AND CONTENT

The schedule shall be printed on 8 1/2-inch by 11-inch white paper. Contractor's standard forms and automated printout may be considered for approval by the Engineer upon Contractor's request. The schedule shall include the following identification:

1. Title of project, as appearing in the Contract Documents, and project location
2. Name of Engineer and Engineer's project number
3. Name and address of Contractor
4. Contract designation
5. Date of submission

The schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction. Each line item in the schedule shall be identified with the number and title of the respective major section of the specifications. Sub-values of major products or operations, as applicable, shall be listed under each line item. Each item shall include a directly proportional amount of the Contractor's overhead and profit. For items on which progress payments will be requested for stored materials, the value shall be broken down into the following elements:

1. The cost of the materials, delivered and unloaded, with taxes paid
2. The total installed value

The sum of all values listed in the Schedule of Values shall equal the total Contract Amount.

1.03 UNIT MATERIAL VALUES

Contractor shall submit a sub-schedule of unit costs and quantities for products on which progress payments will be requested for stored products. The form of submittal shall parallel that of the Schedule of Values, with each item identified the same as the corresponding line item in the Schedule of Values.

The unit quantity for bulk materials shall include an allowance for normal waste. The unit values for the materials shall be the cost of the material, delivered, unloaded, and installed in place, with taxes paid. Copies of invoices for component material shall be included with the payment request in which the material first appears. Paid invoices shall be provided with the second payment request in which the material appears or no payment shall be allowed and/or may be deleted from the request.

The installed unit value multiplied by the quantity listed shall equal the cost of that item in the Schedule of Values.

1.04 LUMP SUM ITEMS

Contractor shall submit a sub-schedule of costs for LUMP SUM items as directed and approved by the Engineer. The scheduled items shall include the following for the payment items listed below.

A. SOILS TESTING FOR SOIL STABILIZATION GROUTING PLAN

- a. Borings and Field Testing
- b. Laboratory Testing
- c. Oversight and Geotechnical Report by Subcontractor's Grouting Consultant

B. DETAILED SOIL STABILIZATION GROUTING PLAN

- a. Identifying materials and equipment to be used for grouting.
- b. Detailed calculations for grout quantities and pressures.

C. CONDITION SURVEYS AND VIBRATION MONITORING

- a. Pre-Construction Surveys
- b. Vibration Monitoring
- c. Post Construction Surveys

D. SPAULDING TURNPIKE CROSSING

- a. Prepare and Obtain Final Spaulding Turnpike Encroachment Permit
- b. Temporary Facilities and Controls
- c. Jacking Pit Construction
- d. Receiving Pit Construction
- e. Subcontractor Mobilization/Demobilization
- f. Casing Pipe Material
- g. Casing Pipe Coatings
- h. Casing Pipe Installation by Subcontractor
- i. Casing Pipe Spacers for Sewer
- j. Casing Pipe Sand Backfill

k. Backfill and Compaction

1.05 ALLOWANCE ITEMS

Contractor shall submit a sub-schedule of costs for ALLOWANCE items as directed and approved by the Engineer. The scheduled items shall include the following for the payment items listed below.

A. SOIL STABILIZATION GROUTING

- a. Oversight by Subcontractor's Grouting Consultant
- b. Subcontractor Mobilization / Demobilization
- c. Grouting Materials
- d. Admixtures
- e. Water
- f. Grouting Equipment Expenses
- g. Grouting Crew Expenses
- h. Miscellaneous Grouting Expendables
- i. Management and Disposal of Excess Grout

END OF SECTION

SECTION 02302

CONDITION SURVEYS AND VIBRATION MONITORING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Conducting pre- and post-construction condition surveys.
- B. Conducting geotechnical, ground movement, and vibration monitoring during construction.
- C. Work shall be performed under the direction of a New Hampshire Licensed Professional Engineer or New Hampshire Licensed Land Surveyor.

1.02 Related Technical Specifications:

- A. Section 02210 – Rock Removal
- B. Section 02211 – Controlled Blasting
- C. Section 02447 – Spaulding Turnpike Crossing

1.03 SUMMARY

- A. Provide all supervision, labor, and materials associated with conducting a pre- and post-construction audio/video survey of all site surface conditions within and 300 feet outside of the limits of construction. Any damage sustained during construction will be repaired by the Contractor to the satisfaction of the Engineer, Owner, utility company, NHDOT and property owner at no additional cost to the Owner.
- B. Provide all supervision, labor, and materials associated with conducting survey, vibration and crack monitoring of all buildings and underground utilities within 300 feet of Contractor's operation. Any damage sustained due to Contractor's operations will be repaired by the Contractor to the satisfaction of the Engineer, Owner, utility company, NHDOT and property owner at no additional cost to the Owner.
- C. Provide all supervision, labor, and materials associated with conducting survey of jacking/receiving pits, roadways, pavement, structures and underground utilities within 50 feet of Contractor's operation. Any damage sustained due to Contractor's operations will be repaired by the Contractor to the satisfaction of the Engineer, Owner, utility company, NHDOT and property owner at no additional cost to the Owner.

1.04 SUBMITTALS

- A. Submittals shall be made in accordance with Section 01300 except as otherwise specified herein.
- B. The Contractor shall submit pre and post construction site surface survey on an audio/video DVD storage device. Identify storage device by DVD number, location, project name, reference drawing number and other distinguishing features as applicable.
- C. The Contractor shall submit an original pre-condition survey report and six (6) copies with all of the documentation to the Engineer for review a minimum of two (2) weeks prior to construction and/or blasting.
- D. The Contractor shall submit daily summaries of peak particle velocities, blast vibration frequencies, and vibration records to the Engineer on a daily basis.
- E. The Contractor shall submit daily summaries of geotechnical monitoring surveys indicating ground, pavement or structure movements.
- F. The Contractor shall submit an original post-condition survey report and six (6) copies with all of the documentation to the Engineer for review no later than two (2) weeks after completion of all blasting operations and no later than two (2) weeks following substantial completion.

1.05 QUALITY CONTROL

- A. The pre- and post-condition surveys and vibration monitoring for blasting shall be performed by a New Hampshire Licensed Professional Engineer. The Engineer retained by the Contractor shall have conducted a minimum of 3 similar studies within the last 5 years.
- B. Geotechnical instrumentation surveys shall be performed by a New Hampshire Licensed Land Surveyor.
- C. Redundant survey markers shall be provided. Contractor shall protect markers from damage.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide all materials as required to complete the work.
- B. Vibration Equipment: Vibrations shall be monitored with triaxial transducers. Provide BlastMate III (or later model) vibration monitor and triaxial transducers as manufactured by Instantel, or approved equal. Provide one triaxial package and one vibration monitor for each simultaneous construction operation to be monitored.

C. Crack Monitors: Crack monitors shall be Calibrated Crack Monitor, as manufactured by ELE International, Inc. or approved equal.

D. Survey targets: Provide adhesive reflective targets with cross hairs as manufactured by Seco, or approved equal.

PART 3 - EXECUTION

3.01 PRE- AND POST-CONSTRUCTION SURVEY

A. Provide a pre- and post-construction audio/video survey of all site surface conditions within and 100 feet outside of the limits of construction. Coverage shall include but not be limited to all existing roadways, sidewalks, fences, curbs, retaining walls, driveways, utilities, landscaping, trees, and other physical features.

B. A pre- and post-construction survey shall be conducted of all buildings, structures, and/or utilities within 300 feet of any blasting operation. The survey shall be conducted prior to the start of blasting. Buildings and structures that fall partially within the 300-foot radius shall have condition surveys performed on the entire building and/or structure.

C. Documentation should include photographs, video, sketches, and a written report of findings. Particular attention should be paid but not limited to the following:

1. Locations and sizes of cracks in interior and exterior walls, floors and ceilings; and missing mortar, plaster or other surface materials;
2. Damaged masonry or roofing including evidence of leakage or poor roof/gutter drainage, such as staining;
3. Damaged or out-of-square doorways and windows including tightness of fit and ease of operation;
4. Walls that are not vertical, floors or ceilings that are not horizontal, and walls, floors or ceilings that are uneven and the extent to which they are not planar;
5. Condition of the foundation walls and basement floor, especially cracking, differential movements, and signs of dampness or wetness;
6. Condition and grading of the ground surface around the exterior of the structure including evidence of drainage towards walls, low spots that pond water, cracks and irregularities in asphalt, concrete, brick or stone pavements, sidewalks, and steps; and,
7. Evidence of previous repairs to the structures.

D. Condition and alignment of accessible and visible underground utilities, including manholes, catch basins, or other utility structures.

E. The Contractor shall submit an original report and six (6) copies with all of the documentation to the Engineer for review a minimum of two (2) weeks prior to blasting.

F. The Contractor shall keep on file, one copy of all of the results of the pre- and post-construction survey in a suitable location at the job site. The documents shall be able to be viewed during normal working hours. No duplicates of any of the information will be permitted without the expressed written consent of the Owner.

G. The post-condition survey shall not be performed until Contractor operations are complete.

3.02 VIBRATION MONITORING

A. During each blasting event, the Contractor shall monitor vibrations at structures and utilities within 300-feet of the blasting location using a vibration monitor capable of measuring vibration accelerations, velocities, amplitudes, and frequencies in three mutually perpendicular directions.

B. The maximum vibration level (in terms of Peak Particle Velocity) for buildings, structures, and underground utilities is 2.0 inches per second, unless more stringent vibration levels have been established (e.g., by utility companies). The Contractor will be responsible for determining the means and methods for preventing the criteria presented from being exceeded during blasting and other construction activities that may cause harmful vibration.

D. Daily summaries of peak particle velocities, blast vibration frequencies, and vibration records shall be submitted to the Engineer on a daily basis.

E. In addition, the daily summaries shall include: the location and distance of the blasting activity in relation to the vibration sensors and nearest structures; and the time and date of the blasting activity.

F. All costs that are incurred by the Owner, utility companies, or property owners that are associated with the exceedance of the specified vibration criteria including, but not limited to, structural damage, shall be borne by the Contractor.

3.03 CRACK MONITORING

A. Crack Monitors shall be installed on all exterior foundation cracks greater than 1/4" in width and as required by the Engineer after review of the pre-condition survey. Crack monitors shall be capable of detecting movement in three mutually perpendicular directions.

END OF SECTION

SECTION 02540

EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Description of Work:

1. Comply with all Federal, State and local regulations pertaining to erosion and sediment control and stormwater management.
2. Prepare a Erosion and Sedimentation Control Plan for review and approval prior to the start of any construction activities.
3. Provide all labor, equipment, materials and maintain temporary erosion control devices as described in the approved Erosion and Sedimentation Control Plan.
4. Provide such erosion control measures as may be necessary to correct conditions that develop prior to the completion of permanent erosion control devices and/or as required to control erosion that occurs during normal construction operations.
5. Provide such sediment control measures as may be necessary to address conditions created by construction dewatering methods and/or stormwater runoff.
6. After award of the Contract, prior to commencement of construction activities, meet with the Engineer to discuss the Plan and develop a mutual understanding relative to implementation and monitoring of erosion and sedimentation control devices.
7. Conduct all construction in a manner and sequence that causes the least practical disturbance of the physical environment.
8. Stabilize disturbed earth surfaces in the shortest practical time and employ such temporary erosion control devices as may be necessary until such time as adequate soil stabilization has been achieved.
9. Refer to Drawings G-001, G-002 and C-105 for erosion and sediment control requirements and typical details.

B. Recommended Guides

1. AASHTO Highway Drainage Guidelines, Volume III, Guidelines for Erosion and Sediment Control in Highway Construction, American Association of State Highway and Transportation Officials, Inc., 444 North Capital St. N.W., Suite 249, Washington, D.C. 20001.
2. Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire, New Hampshire Department of

Environmental Services, Public Information Office, P.O. Box 95, 6 Hazen Drive,
Concord, New Hampshire.

3. Storm Water Phase II Compliance Assistance Guide, Section 5 Small Construction Activity, United State Environmental Protection Agency, Publication No. 833-R-00-002.

1.03 SUBMITTALS:

- A. The following submittals shall be provided in accordance with Section 01300:
 1. Product Data and Samples.
 2. Erosion and Sedimentation Control Plan.

PART 2 - PRODUCTS

2.01 EROSION AND SEDIMENTATION CONTROL PLAN

- A. Prior to the start of construction submit the Erosion and Sedimentation Control Plan in accordance with the Shop Drawing review process in Section 01300.

2.02 ACCEPTABLE MATERIALS

- A. Baled Hay: At least 16" x 16" x 48" securely tied and staked twice per bale.
- B. Stone Check Dams: Washed $\frac{3}{4}$ inch crushed stone free of sand and silts.
- C. Mulches:
 1. Crushed stone, loose hay, straw, peat moss, pine straw or needles, sawdust, wood chips, wood excelsior, or wood fiber cellulose.
 2. Type and use shall be suitable for the Work.
- D. Mats and Netting:
 1. Twisted craft paper, yarn, jute, excelsior, wood fiber mats, glass fiber, and plastic film.
 2. Type and use shall be suitable for the Work.
- E. Seed:
 1. Standard conservation mix of 100% annual rye grass or field broomgrass.

2. Equivalent seed mixture may be used, as approved by the Engineer, based on its suitability for use in controlling erosion of the various soil types and slopes.

F. Sod:

1. Grown from seed of adapted varieties to produce high quality sod, free of any serious thatch, weeds, insects, diseases and other pest problems.
2. At least one year old and not older than three years. Cut with 1/2" to 1" layer of soil.

G. Drains:

1. Flexible drains consisting of collapsible neoprene pipe, minimum of 8" in diameter, or an approved equal.
2. Corrugated metal pipe and inlet of a gauge consistent with the loading conditions. A minimum size of 12 inches in diameter or approved equal.

PART 3 - EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

A. Temporary Stone Checks:

1. Construct temporary erosion checks in ditches and other locations as needed.
2. Baled hay and/or sand bags may be used in an arrangement to fit local conditions designated by the Engineer.
3. Terrace side slopes to retard runoff velocities.

B. Temporary Berms (When Applicable):

1. Construct temporary barriers along the toe of embankments.
2. Construct temporary side drains in intervals as needed.

C. Temporary Slope Drains: Shall be collapsible pipe with corrugated metal pipe inlet with a crescent shaped barrier placed at each slope drain.

D. Debris Basin:

1. A barrier or dam constructed across waterway or other suitable location to form a silt or sediment basin.

2. Capacity shall be equal to the volume of sediment expected to be trapped at the site during the planned use for life of the structure or, if the periodic removal of debris would be practical, the capacity shall be proportionally reduced.

3.02 PERFORMANCE

- A. Install erosion control devices as described in the approved Plan.
 1. Apply seed for temporary cover at a rate of 40 lbs. per acre.
 2. Apply hay or straw at a rate of 2 tons per acre.
 3. Hydroseed all temporarily seeded areas.
- B. Protection:
 1. Protect streams and channels from fuel, lubricants and other pollutants.
 2. Locate storage of materials in shop yards where erosion and sediment hazards are slight.
- C. Corrective Action:
 1. In the course of monitoring of the Work, should inadequate protection measures or deficiencies be identified, the Contractor shall implement corrective actions to comply with project requirements at no additional cost to Owner.

3.03 REMOVAL AND DISPOSAL

- A. General: When permanent soil stabilization has been achieved, remove all temporary materials and devices that are unsightly.
- B. Reuse: Materials and devices of suitable type and conditions may be reused at other onsite locations. Materials and devices, determined by the Engineer to be unsuitable for reuse, shall become the Contractor's property and shall be disposed of in a manner and location approved by the Owner.
- C. Onsite Disposal when Applicable: The locations and methods of onsite disposal are subject to the Owner's approval. Onsite disposal that results in unsightly conditions, precludes proper maintenance and is detrimental to the physical environment will not be permitted.

END OF SECTION