PROJECT MANUAL

FOR

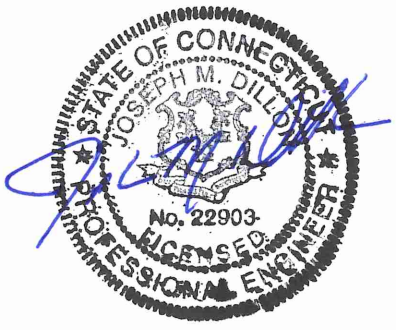
TOWN OF BOLTON, CONNECTICUT

LORI ROAD DRAINAGE REPAIRS

FIRST SELECTMAN
Rodney Fournier

BOARD OF SELECTMAN
Pamela Sawyer
Timothy Sadler
Robert Morra
Mather Clarke
Amanda Gordon
Gwen Marrion

TOWN ADMINISTRATOR
James Rupert



September 2024

NATHAN L. JACOBSON & ASSOCIATES, INC.
CONSULTING CIVL & ENVIRONMENTAL ENGINEERS SINCE 1972
CHESTER, CONNECTICUT

PROJECT MANUAL TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00

SPECIFICATIONS

DIVISION 01 - GENERAL REQUIREMENTS

DIVISION 02 - EXISTING CONDITIONS

DIVISION 31 - EARTHWORK

DIVISION 32 - EXTERIOR IMPROVEMENTS

DIVISION 33 - UTILITIES

TOWN OF BOLTON, CONNECTICUT
LORI ROAD DRAINAGE REPAIRS

INVITATION TO BID

Sealed Bids for **Lori Road Drainage Repairs** will be received by the **Town of Bolton** at the Issuing Office until **10:00 AM** local time on **October 1, 2024**. At which time the Bids received will be publicly opened and read aloud. **The Project generally consists of the removal and replacement of storm drainage piping and structures along with site restoration.**

Bids will be received for a single prime Contract. Bids shall be on a lump sum and unit price basis as indicated in the Bid Form.

Bidding Documents are available for free download from the Project's bidding service webpage. To download Bidding Documents: go to the bidding service homepage listed below; select this project's solicitation; sign in and/or register as directed; and select the Bidding Documents for download.

Bidding service homepage: http://www.bidexpress.com/businesses/27674/home.

The Issuing Office is: **Town Administrator's Office, Bolton Town Hall, 222 Bolton Center Road, Bolton, CT 06043**.

A pre-bid meeting will be held at **10:30 AM** local time on **September 17, 2024** at **222 Bolton Center Road.** Attendance at the pre-bid meeting is encouraged but is not mandatory.

The successful Bidder will be required to provide a Payment Bond and a Performance Bond each in the amount of one hundred percent of the Contract Price. The Surety Company shall be licensed in the State of Connecticut and listed on IRS Department Circular 570.

Bid Bond is not required. The bidder agrees that its bid shall be good, capable of being accepted, and may not be withdrawn for a period of sixty [60] days, Saturdays, Sundays and legal holidays excluded, after the opening of bids.

The successful Bidder shall comply with the requirements of Prevailing Wage Rate Laws in accordance with Section 31-51 of the Connecticut General Statutes.

The Owner is exempt from payment of Sales and Use Taxes on all materials and equipment to be incorporated in the Work. These taxes shall not be included in the Bid.

All work to be performed in connection with the proposed project will be subject to all applicable federal, state, and local laws, ordinances and regulations.

If the Town of Bolton determines, in its sole discretion, to proceed with the work, the successful bidder must execute and deliver a Contract for Construction of a Small Project and furnish valid Certificates of Insurance prior to the start of any work.

No Bid may be withdrawn until sixty (60) days after the Bid Opening. The Town reserves the right to reject any or all bids; make extensions to review Bids; waive informalities or defects; and to accept the Bid that, in the Town's judgment, will be in its best interests.

The Town of Bolton is an equal opportunity provider and employer.

Owner: Town of Bolton, Connecticut

By: James Rupert, Administrative Officer

Date: September 9, 2024

+ + END OF INVITATION TO BID + +

EJCDC® C-111, Suggested Advertisement for Bids for Construction Contracts.
Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

Section Page

EJCDC® C-200, Instructions to Bidders for Construction Contracts.
Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

ARTICLE 1 – DEFINED TERMS

1.01 ~~Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms~~ ***Terms*** used in these Instructions to Bidders have the meanings indicated below:

A. ***Agreement - The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.***

B. ***Bid—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.***

C. ***Bidder—An individual or entity that submits a Bid to Owner.***

D. ***Bid Form – The Contract for Construction of a Small Project (EJCDC C-522).***

E. ***Bidding Documents – The Bidding Requirements, the proposed Contract Documents, and all Addenda.***

F. ***Bidding Requirements – The advertisement or invitation to bid, Instruction to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.***

G. ***Bid Submittal – Contract for Construction of a Small Project (Bid Form), the Non-Collusion Affidavit of Bidder Form, and any attachments to support the Bidder's information provided in the Bid. Submittal may be in the form of the Project Manual provided with the Bidding Documents.***

H. ***Contract Documents – As defined in Section 2.02 of the Contract for Construction of a Small Project (EJCDC C-522).***

I. *Issuing Office* – The office from which the Bidding Documents are to be issued ***defined in the advertisement for bids or invitation to bid***.

J. ***Project Manual—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, and Specifications. The contents of the Project Manual may be bound in one or more volumes.***

K. ***Work—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.***

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

2.01 Complete sets of the Bidding Documents ~~may~~ will be ***provided via E-mail to prospective bidders*** ~~obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid~~.

2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

EJCDC® C-200, Instructions to Bidders for Construction Contracts.
Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

2.03 Owner and Engineer, in making ~~copies of~~ Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

3.01 ~~To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit with its Bid (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:~~

~~A. Evidence of Bidder's authority to do business in the state where the Project is located~~

~~B. Bidder's state or other contractor license number, if applicable.~~

3.02 ~~A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.~~

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

A. ***There are no existing hazardous environmental conditions at the project site known to the Owner***. Test pit information is shown on the Drawings. ~~Subsurface and Physical Conditions; Hazardous Environmental Conditions~~

~~1. The Supplementary Conditions identify:~~

~~a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.~~

~~b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).~~

~~c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.~~

~~d. Technical Data contained in such reports and drawings.~~

~~2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the~~

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

~~Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.~~

~~3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.~~

B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in ~~Paragraphs 5.03, 5.04, and 5.05 of the General Conditions~~ ***Paragraph 11.01 of the Contract for Construction of a Small Project.*** ~~Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.~~

4.03 *Site Visit and Testing by Bidders*

A. Bidder shall conduct the required Site visit during normal working hours and shall not disturb any ongoing operations at the Site.

B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.

D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. ***Owner shall furnish copies of any applicable Owner safety programs to Bidders.*** ~~As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.~~

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

4.05 *Other Work at the Site*

A. ~~Reference is made to Article 8 of the Supplementary Conditions for the~~ ***Owner will provide Bidders*** with identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER'S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;

B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;

C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;

D. carefully study all: (1) ***if any,*** 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~~ ***Bidding Documents***, 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~~ ***Bidding Documents***, especially with respect to Technical Data in such reports and drawings;

E. consider 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 the 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. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its 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. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;

H. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

I. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

J. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, 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 6 – PRE-BID CONFERENCE

6.01 A pre-Bid conference will be held at the time and location stated in the invitation or advertisement to bid. Representatives of Owner and Engineer will be present to discuss the Project. Bidders are encouraged to attend and participate in the conference. Engineer will transmit to all prospective Bidders of record such Addenda as Engineer considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing ***by emailing to*** jdillon@nlja.com. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than ~~seven~~ ***three*** days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

~~**ARTICLE 8 – BID SECURITY**~~

8.01 ~~A Bid must be accompanied by Bid security made payable to Owner in an amount of **five** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.~~

8.02 ~~The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.~~

8.03 ~~The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.~~

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

8.04 ~~Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.~~

ARTICLE 9 – CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the ~~Agreement~~ ***Contract for Construction of a Small Project.***

ARTICLE 10 – LIQUIDATED DAMAGES

10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the ~~Agreement~~ ***Contract for Construction of a Small Project.***

ARTICLE 11 – SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 ***Refer to the Contract for Construction of a Small Project for any limitations on subcontracting the Work included in the original Contract Price*.**

ARTICLE 13 – PREPARATION OF BID

13.01 The ***Contract for Construction of a Small*** Project (Bid Form***)*** is included with the Bidding Documents.

A. All blanks on the Bid Form***, except the "Owner" section and Effective Date of Contract on the last page***, shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable".

C. ***Other documents required with the bid submittal are listed in Article 2.02.B of the Contract for Construction of a Small Contract.***

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown. ***The corporate seal shall be affixed and attested by the secretary or an assistant secretary.***

13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

13.04 A Bid by an individual shall show the Bidder's name and official address.

13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venture in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

13.06 All names shall be printed in ink below the signatures.

13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form ***in Section 2.02, Item 6***.

13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.

13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 14 – BASIS OF BID

14.01 *Unit Price*

A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity" (which Owner or its representative has set forth in the Bid Form) for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined ~~in accordance with Paragraph 13.03 of the General Conditions~~ ***by the actual quantities and classifications of Unit Price Work performed by the Contractor and approved by the Engineer***.

C. Discrepancies between 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 resolved in favor of the correct sum.

14.02 *Allowances*

A. For cash allowances the Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

ARTICLE 15 – SUBMITTAL OF BID

15.01 ***Execute and submit the Contract for Construction of a Small Project and documents listed in Article 2.02.B of the same document. No Bid Security is required.*** ~~With each copy of the Bidding Documents, a Bidder is furnished one separate unbound copy of the Bid Form, and, if required, the Bid Bond Form. The unbound copy of the Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 7 of the Bid Form.~~

15.02 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, ~~and shall be accompanied by the Bid security~~ and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED". A mailed Bid shall be addressed to ***the Issuing Office.***

15.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.

16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 All Bids will remain subject to acceptance for ***60 days*** ~~the period of time stated in the Bid Form~~, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

19.01 Owner reserves the right to reject any or all Bids, including without limitation, ***conforming or*** nonconforming, ***responsive or*** nonresponsive, ***balanced or*** unbalanced, ***and/***or conditional ***or unconditional*** Bids. Owner will reject***, in its sole discretion,*** the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be ~~responsible~~ ***responsive***. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.

19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.

19.03 Evaluation of Bids

A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder**.** Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders.

19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders~~ and any proposed Subcontractors or Suppliers~~.

19.06 ***The Owner reserves the right to reject any Bid in which the prices appear, in the judgment of the Engineer, to constitute an unbalanced Bid for the Work. Unbalanced prices shall be interpreted to mean that the unit price for any item is such that it is unreasonable for that item when considered in connection with the Bid submitted on any other item or items.***

19.07 ***The lowest responsible responsive Bid will be determined by the Owner on the basis of the gross sum for which the entire Work will be performed, arrived at by a correct computation of all of the items specified in the Bid therefore at the prices stated in the Bid. Where the Bid form does not provide for deductive alternates, the gross sum will be the Bid Price for the Total of All Bid Items. Where the Bid form provides for a base Bid and deductive alternates, said gross sum will be arrived at as follows:***

A. ***If at the time the Contract is to be awarded, the lowest base Bid submitted by a responsible, responsive Bidder does not exceed the amount of funds then established by the Owner as available to finance the Contract, the Contract will be awarded on the base Bid only. If such Bid exceeds such amount, the Owner may reject all Bids or may award the Contract on the base Bid combined with such deductive alternates applied as the Owner deems necessary so as to produce a net amount that is within the available allocated funds for the Project. Alternates shall be deducted in numerical order, starting with Alternate No. 1 and proceeding to the highest numbered Alternate necessary to produce the required net amount.***

EJCDC® C-200, Instructions to Bidders for Construction Contracts.
Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

19.08 ***Before award is made to a Bidder not a resident of the State in which the Project is located, such Bidder shall designate in said State a person on who service of process can be made in the event of litigation.***

ARTICLE 20 – BONDS AND INSURANCE

20.01 Article 6 of the ***Contract for Construction of Small Projects*** ~~General Conditions, as may be modified by the Supplementary Conditions~~, sets forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by required bonds and insurance documentation.

ARTICLE 21 – SIGNING OF AGREEMENT

21.01 When Owner issues a Notice of Award to the Successful Bidder~~, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement~~. Within 15 days thereafter, Successful Bidder shall execute and deliver the required ~~number of counterparts of the Agreement (and any bonds and~~ insurance documentation required to be delivered by the Contract Documents~~)~~ to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder~~, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions~~.

ARTICLE 22 – SALES AND USE TAXES

22.01 Owner is exempt from ***State of Connecticut*** state sales and use taxes on materials and equipment to be incorporated in the Work. ~~(Exemption No. [_____]).~~ Said taxes shall not be included in the Bid. Refer to Paragraph ***7.07.D of the Contract for Construction of Small Projects*** ~~SC-7.09 of the Supplementary Conditions~~ for additional information.

ARTICLE 23 – NON-DISCRIMINATION AND EQUAL EMPLOYMENT OPPORTUNITY

23.01 ***The Contract Documents provide that the Contractor and his Subcontractors shall not discriminate against any employee or applicant for employment because of race, creed, color, national origin, age, sex, sexual orientation, marital status or physical disability. The successful Bidder must be prepared to comply in all respects with the provisions regarding non-discrimination as set forth in the Contract Documents and all applicable Federal and State laws.***

ARTICLE 24 – COMPLIANCE WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND CODES

24.01 ***All applicable Federal, State and Municipal laws, ordinances, rules, regulations and codes of all authorities having jurisdiction over construction work in the locality of the Project shall apply to the Contract throughout and they are deemed to be included in the Contract Documents the same as though written therein.***

24.02 ***Attention is directed to laws and regulations of the State Labor Department with respect to employment conditions and minimum wages***.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

CONTRACT FOR CONSTRUCTION OF A SMALL PROJECT

This Contract is by and between Town of Bolton, Connecticut (Owner) and

_____ (Contractor).

Owner and Contractor hereby agree as follows:

ARTICLE 1 - THE WORK

1.01 Work

A. Work includes all labor, materials, equipment, services, and documentation necessary to construct the Project defined herein. The Work may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

B. The Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project is generally described as follows:

1. **Removal and replacement of storm drainage piping and structures along with the restoration of vegetated surfaces**.

2. The Site of the Work includes property, easements, and designated work areas described in greater detail in the Contract Documents but generally located **between Lori Road and the cul-de-sac at Valerie Drive**

ARTICLE 2 - CONTRACT DOCUMENTS

2.01 Intent of Contract Documents

A. It is the intent of the Contract Documents to describe a functionally complete project. The Contract Documents do not indicate or describe all of the Work required to complete the Project. Additional details required for the correct installation of selected products are to be provided by the Contractor and coordinated with the Owner and Engineer. This Contract supersedes prior negotiations, representations, and agreements, whether written or oral. The Contract Documents are complementary; what is required by one part of the Contract Documents is as binding as if required by other parts of the Contract Documents.

B. During the performance of the Work and until final payment, Contractor and Owner shall submit all matters in question concerning the requirements of the Contract Documents, or relating to the acceptability of the Work under the Contract Documents to the Engineer. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

C. Engineer will render a written clarification, interpretation, or decision on the issue submitted, or initiate a modification to the Contract Documents.

D. Contractor, and its subcontractors and suppliers, shall not have or acquire any title to or ownership rights to any of the Drawings, Specifications, or other documents (including copies or electronic media editions) prepared by Engineer or its consultants.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

2.02 Contract Documents Defined

A. The Contract Documents consist of the following documents:

1. This Contract.
2. Performance bond.
3. Payment bond.
4. Specifications listed in the Table of Contents.
5. Addenda.

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____

6. Exhibits to this Contract (enumerated as follows):
   a. ~~Exhibit 1 – CTDOT Standard Drawings.~~ Contract Drawings titled "Lori Road Drainage Repairs".
7. **The following documents are to be submitted with and made a condition of this Bid:**
   a. Non-Collusion Affidavit.
8. The following which may be delivered or issued on or after the Effective Date of the Contract:
   a. Notice of Award Form.
   b. Notice to Proceed.
   c. Work Change Directives (EJCDC C-940).
   d. Change Orders (EJCDC C-941).
   e. Field Orders.
   f. Certificate of Substantial Completion.

ARTICLE 3 - ENGINEER

3.01 Engineer

A. The Engineer for this Project is **Nathan L. Jacobson & Associates, Inc**.

ARTICLE 4 - CONTRACT TIMES

4.01 Contract Times

A. The Work will be substantially completed within 60 days after the Effective Date of the Contract. ~~and completed and ready for final payment within **[Number of Days]** days after the Effective Date of the Contract.~~

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

4.02 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence in the performance of the Contract Work according to the requirements of Paragraph 4.01. Because such damages for delay would be difficult and costly to determine, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner $500 for each day that expires after the Contract Time for substantial completion.

4.03 Delays in Contractor's Progress

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor may ~~shall~~ be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor or their subcontractors or suppliers.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor may ~~shall~~ be entitled to an equitable adjustment in Contract Times.

D. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor or Contractor's subcontractors or suppliers.

4.04 Progress Schedules

A. Contractor shall develop a progress schedule and submit to the Engineer for review and comment before starting Work on the Site. The Contractor shall modify the schedule in accordance with the comments provided by the Engineer.

B. The Contractor shall update and submit the progress schedule to the Engineer each month. The Owner may withhold payment if the Contractor fails to submit the schedule.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

ARTICLE 5 - CONTRACT PRICE

5.01 Payment

A. Owner shall pay Contractor in accordance with the Contract Documents at the following unit prices for each unit of Work completed:

Item No.	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	All WORK included in the Contract Documents for of Lori Road Drainage Repairs except for WORK included under Items 2 through 5	L.S.	1		
2	Additional Excavation As Ordered By Engineer (A.O.B.E.)	C.Y.	30		
3	Additional Granular Fill As Ordered By Engineer (A.O.B.E.)	C.Y.	15		
4	Additional 3/4" Crushed Stone As Ordered By Engineer (A.O.B.E.)	C.Y.	15		
5	Additional Geotextile As Ordered By Engineer (A.O.B.E.)	S.Y.	60		
Total of all extended prices for Estimated Quantities of Work					**$**

Final payment will be made in an amount equal to the total of all extended prices for actual Work completed. The extended price is determined by multiplying the unit price times the actual quantity of that Work item completed. Actual quantities installed will be determined by the Engineer.

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 - BONDS AND INSURANCE

6.01 Bonds

A. Before starting Work, Contractor shall furnish a performance bond and a payment bond from surety companies that are duly licensed or authorized to issue bonds in the required amounts in the jurisdiction in which the Project is located. Each bond shall be in an amount equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until the completion of

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

the correction period specified in Paragraph 7.12 but, in any case, not less than one year after the date when final payment becomes due.

6.02 Insurance

A. Before starting Work, Contractor shall furnish evidence of insurance from companies that are duly licensed or authorized in the jurisdiction in which the Project is located with a minimum AM Best rating of A-VII or better. Contractor shall provide insurance in accordance with the following:

1. Contractor shall provide coverage for not less than the following amounts, or greater where required by Laws and Regulations:

a. Workers' Compensation:

State:		Statutory
Employer's Liability:		
Bodily Injury, each Accident	$	100,000
Bodily Injury By Disease, each Employee	$	100,000
Bodily Injury/Disease Aggregate	$	500,000
Foreign Voluntary Worker Compensation		Statutory

b. Commercial General Liability:

General Aggregate	$	2,000,000
Products - Completed Operations Aggregate	$	2,000,000
Personal and Advertising Injury	$	1,000,000
Each Occurrence (Bodily Injury and Property Damage)	$	1,000,000

c. Automobile Liability herein:

Combined Single Limit of:	$	1,000,000

d. Excess or Umbrella Liability:

Per Occurrence	$	2,000,000
General Aggregate	$	2,000,000

e. Contractor's Pollution Liability:

Each Occurrence	$	1,000,000
General Aggregate	$	1,000,000

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

B. Additional Insureds:

Owner: Town of Bolton

Engineer: Nathan L. Jacobson & Associates, Inc.

C. All insurance policies required to be purchased and maintained will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the insured and additional insured.

D. Automobile liability insurance provided by Contractor shall provide coverage against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. Contractor's commercial general liability policy shall be written on a 1996 or later ISO commercial general liability occurrence form and include the following coverages and endorsements:

1. Products and completed operations coverage maintained for three years after final payment;
2. Blanket contractual liability coverage to the extent permitted by law;
3. Broad form property damage coverage; and
4. Severability of interest; underground, explosion, and collapse coverage; personal injury coverage.

F. The Contractor's commercial general liability and automobile liability, umbrella or excess, and pollution liability policies shall include and list Owner and Engineer and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each as additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis.

1. Additional insured endorsements will include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
2. Contractor shall provide ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent for design professional additional insureds.

G. Umbrella or excess liability insurance shall be written over the underlying employer's liability, commercial general liability, and automobile liability insurance. Subject to industry-standard exclusions, the coverage afforded shall be procured on a "follow the form" basis as to each of the underlying policies. Contractor may demonstrate to Owner that Contractor has met the combined limits of insurance (underlying policy plus applicable umbrella) specified for

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policies and an umbrella or excess liability policy.

H. The Contractor shall provide property insurance covering physical loss or damage during construction to structures, materials, fixtures, and equipment, including those materials, fixtures, or equipment in storage or transit.

I. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 15.

ARTICLE 7 - CONTRACTOR'S RESPONSIBILITIES

7.01 Supervision and Superintendence

A. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, safety, and procedures of construction.

B. Contractor shall assign a competent resident superintendent who is to be present at all times during the execution of the Work. This resident superintendent shall not be replaced without written notice to and approval by the Owner and Engineer except under extraordinary circumstances.

C. Contractor shall at all times maintain good discipline and order at the Site.

D. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday.

7.02 Other Work at the Site

A. In addition to and apart from the Work of the Contractor, other work may occur at or adjacent to the Site. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

7.03 Services, Materials, and Equipment

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be new, of good quality and shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise may be provided in the Contract Documents.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

7.04 Subcontractors and Suppliers

A. Contractor may retain subcontractors and suppliers for the performance of parts of the Work. Such subcontractors and suppliers must be acceptable to Owner.

7.05 Quality Management

A. Contractor is fully responsible for the managing quality to ensure Work is completed in accordance with the Contract Documents.

7.06 Licenses, Fees and Permits

A. Contractor shall pay all license fees and royalties and assume all costs incident to performing the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others.

B. Contractor shall obtain and pay for all construction permits and licenses unless otherwise provided in the Contract Documents.

7.07 Laws and Regulations; Taxes

A. Contractor shall give all notices required by and shall comply with all local, state, and federal Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. Contractor shall bear all resulting costs and losses, and shall **defend,** indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages if Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations.

C. Contractor shall pay all applicable sales, consumer, use, and other similar taxes Contractor is required to pay in accordance with Laws and Regulations.

D. ***Owner is exempt from payment of sales and compensating use taxes of the State of Connecticut and of cities and counties thereof on all materials to be incorporated into the Work***.

1. ***Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.***

2. ***Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.***

3. ***The Contractor may be exempt from payment of Federal Transportation Taxes in accordance with the provisions of Revenue Ruling 55-162 which exempts a state or political subdivision thereof from the Federal Transportation Tax on construction materials consigned to construction projects. Therefore, the Contractor will be authorized to consign to the Owner in care of the Contractor any materials for shipment to the site which will be incorporated in the Work.***

4. ***The Federal Transportation Tax exemption applies only to construction materials and does not cover any transportation tax on fuel, lubricants, spare parts, and items of***

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

construction equipment belonging to the Contractor which will not be incorporated in the Work. The Contractor shall pay all transportation costs and demurrage which may be incurred in connection with the furnishing of all materials to the Project.

5. The consignment authority as granted by the Owner is to the Contractor. Should the Contractor employ Subcontractors and others who furnish construction materials which are to be incorporated in the Work, it will be necessary for the Contractor to authorize the consignment of such materials to the Owner in care of the Contractor, for shipment to the site. The Contractor shall be held responsible for the extension of this consignment authority.

7.08 Record Documents

A. Contractor shall maintain one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved shop drawings in a safe place at the Site. Contractor shall annotate them to show changes made during construction. Contractor shall deliver these record documents to Engineer upon completion of the Work.

7.09 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.

B. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. All persons on the Site or who may be affected by the Work;

2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.

C. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, or anyone for whose acts the Contractor may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Contract Documents or to the acts or omissions of Owner or Engineer and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).

D. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

E. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor shall act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

7.10 Shop Drawings, Samples, and Other Submittals

A. Contractor shall review and coordinate the shop drawing and samples with the requirements of the Work and the Contract Documents and shall verify all related field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information.

B. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.

C. With each submittal, Contractor shall give Engineer specific written notice, in a communication separate from the submittal, of any variations that the shop drawing or sample may have from the requirements of the Contract Documents.

D. Engineer will provide timely review of shop drawings and samples.

E. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs.

F. Engineer's review and approval of a separate item does not indicate approval of the assembly in which the item functions.

G. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of shop drawings and submit, as required, new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

H. Shop drawings are not Contract Documents.

7.11 Warranties and Guarantees

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

7.12 Correction Period

A. If within one year after the date of substantial completion, any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly and without cost to Owner, correct such defective Work.

7.13 Indemnification

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall **defend,** indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury,

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts they may be liable.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 Owner's Responsibilities

A. Except as otherwise provided in the Contract Documents, Owner shall issue all communications to Contractor through Engineer.

B. Owner shall make payments to Contractor as provided in this Contract.

C. Owner shall provide Site and easements required to construct the Project.

D. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, unless stated elsewhere in the Contract Documents, Owner shall have sole authority and responsibility for such coordination.

E. The Owner shall be responsible for performing inspections and tests required by applicable codes.

F. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

G. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

H. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 Engineer's Status

A. Engineer will be Owner's representative during construction. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in this Contract.

B. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any subcontractor, any supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

C. Engineer will make visits to the Site at intervals appropriate to the various stages of construction. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

D. Engineer has the authority to reject Work if Contractor fails to perform Work in accordance with the Contract Documents.

E. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work.

F. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

ARTICLE 10 - CHANGES IN THE WORK

10.01 Authority to Change the Work

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work.

10.02 Change Orders

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in the Work which are: (a) ordered by Owner or (b) agreed to by the parties or (c) resulting from the Engineer's decision, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

3. Changes in the Contract Price or Contract Times or other changes which embody the substance of any final binding results under Article 12.

B. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 11 - DIFFERING SUBSURFACE OR PHYSICAL CONDITIONS

11.01 Differing Conditions Process

A. If Contractor believes that any subsurface or physical condition including but not limited to utilities or other underground facilities that are uncovered or revealed at the Site either differs materially from that shown or indicated in the Contract Documents or is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents then Contractor shall, **within ten days** ~~promptly~~ after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency), notify Owner and Engineer in writing about such

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so. **Failure to comply with the notice requirement shall be deemed a waiver of any claim hereunder.**

B. After receipt of written notice, Engineer will promptly:

1. Review the subsurface or physical condition in question;
2. Determine necessity for Owner obtaining additional exploration or tests with respect to the condition;
3. Determine whether the condition falls within the differing site condition as stated herein;
4. Obtain any pertinent cost or schedule information from Contractor;
5. Prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and
6. Advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

ARTICLE 12 - CLAIMS AND DISPUTE RESOLUTION

12.01 Claims Process

A. The party submitting a claim shall deliver it directly to the other party to the Contract and the Engineer promptly (but in no event later than 10 days) after the start of the event giving rise thereto.

B. The party receiving a claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the claim through the exchange of information and direct negotiations. All actions taken on a claim shall be stated in writing and submitted to the other party.

C. If efforts to resolve a claim are not successful, the party receiving the claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the claim within 45 days, the claim is deemed denied.

D. If the dispute is not resolved to the satisfaction of the parties, Owner or Contractor shall ***attempt to resolve the dispute by arbitration*** ~~give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction~~ unless the Owner and Contractor both agree to an alternative dispute resolution process.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION OF DEFECTIVE WORK

13.01 Tests and Inspections

A. Owner and Engineer will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access.

B. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

C. If any Work that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense.

13.02 Defective Work

A. Contractor shall ensure that the Work is not defective.

B. Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. The Contractor shall promptly correct all such defective Work.

E. When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. If the Work is defective or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

ARTICLE 14 - PAYMENTS TO CONTRACTOR

14.01 Progress Payments

A. The Contractor shall prepare a schedule of values that will serve as the basis for progress payments. The schedule of values will be in a form of application for payment acceptable to Engineer. The unit price breakdown submitted with the bid will be used for unit price work. Break lump sum items into units that will allow for measurement of Work in progress.

14.02 Applications for Payments:

A. Contractor shall submit an application for payment in a form acceptable to the Engineer, no more frequently than monthly, to Engineer. Applications for payment will be prepared and signed by Contractor. Contractor shall provide supporting documentation required by the Contract Documents. Payment will be paid for Work completed as of the date of the application for payment.

B. Beginning with the second application for payment, each application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

have been applied on account to discharge Contractor's legitimate obligations associated with prior applications for payment.

14.03 Retainage

A. The Owner shall retain 5% of each progress payment until the Work is substantially complete.

14.04 Review of Applications

A. Within 10 days after receipt of each application for payment, the Engineer will either indicate in writing a recommendation for payment and present the application for payment to Owner or return the application for payment to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. The Contractor will make the necessary corrections and resubmit the application for payment.

B. Engineer will recommend reductions in payment (set-offs) which, in the opinion of the Engineer, are necessary to protect Owner from loss because the Work is defective and requires correction or replacement.

C. The Owner is entitled to impose set-offs against payment based on any claims that have been made against Owner on account of Contractor's conduct in the performance of the Work, incurred costs, losses, or damages on account of Contractor's conduct in the performance of the Work, or liquidated damages that have accrued as a result of Contractor's failure to complete the Work.

14.05 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

14.06 Substantial Completion

A. The Contractor shall notify Owner and Engineer in writing that the Work is substantially complete and request the Engineer issue a certificate of substantial completion when Contractor considers the Work ready for its intended use. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Engineer will make an inspection of the Work with the Owner and Contractor to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor and Owner in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete or upon resolution of all reasons for non-issuance of a certificate identified in 14.06.B, Engineer will deliver to Owner a certificate of substantial completion which shall fix the date of substantial completion and include a punch list of items to be completed or corrected before final payment.

14.07 Final Inspection

A. Upon written notice from Contractor that the entire Work is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.08 Final Payment

A. Contractor may make application for final payment after Contractor has satisfactorily completed all Work defined in the Contract, including providing all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents and other documents.

B. The final application for payment shall be accompanied (except as previously delivered) by:

1. All documentation called for in the Contract Documents;

2. Consent of the surety to final payment;

3. Satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any liens or other title defects, or will so pass upon final payment;

4. A list of all disputes that Contractor believes are unsettled; and

5. Complete and legally effective releases or waivers (satisfactory to Owner) of all lien rights arising out of the Work, and of liens filed in connection with the Work.

C. The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

14.09 Waiver of Claims

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 60 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor **may** ~~shall~~ be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension.

15.02 Owner May Terminate for Cause

A. Contractor's failure to perform the Work in accordance with the Contract Documents or other failure to comply with a material term of the Contract Documents will constitute a default by Contractor and justify termination for cause.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

B. If Contractor defaults in its obligations, then after giving Contractor and any surety ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. Declare Contractor to be in default, and give Contractor and any surety notice that the Contract is terminated; and

2. Enforce the rights available to Owner under any applicable performance bond.

C. Owner may not proceed with termination of the Contract under Paragraph 15.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

D. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

E. In the case of a termination for cause, if the cost to complete the Work, including related claims, costs, losses, and damages, exceeds the unpaid contract balance, Contractor shall pay the difference to Owner.

15.03 Owner May Terminate for Convenience

A. Upon seven days written notice to Contractor, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for, without duplication of any items:

1. Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. Expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. Other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

15.04 Contractor May Stop Work or Terminate

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner, and provided Owner does not remedy such suspension or failure within that time, either stop the Work until payment is received, or terminate the Contract and recover payment from the Owner.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

ARTICLE 16 - CONTRACTOR'S REPRESENTATIONS

16.01 Contractor Representations

A. Contractor makes the following representations when entering into this Contract:

1. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.

2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

3. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on:

a. The cost, progress, and performance of the Work;

b. The means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and

c. Contractor's safety precautions and programs.

5. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

6. Contractor 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 Contract Documents.

7. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

8. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

9. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that, without exception, all prices in the Contract are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 17 - MISCELLANEOUS

17.01 Cumulative Remedies

A. The duties and obligations imposed by this Contract and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.02 Limitation of Damages

A. Neither Owner, Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

17.03 No Waiver

A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

17.04 Survival of Obligations

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 Contractor's Certifications

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract.

17.06 Controlling Law

A. This Contract is to be governed by the law of the state in which the Project is located.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

IN WITNESS WHEREOF, Owner and Contractor have signed this Contract.

This Contract will be effective on _____ (which is the Effective Date of the Contract).

OWNER:	CONTRACTOR:
Town of Bolton	
By:	By:
Title:	Title:
	(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)
Attest:	Attest:
Title:	Title:
Address for giving notices:	Address for giving notices:
	License No.: (where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Contract.)

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

NON-COLLUSION AFFIDAVIT OF BIDDER

State of _____}

}SS.

County of _____}

_____, being first duly sworn, deposes and says that:

(1) He is _____ of _____, the Bidder that has submitted the attached Bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any Bidder, or to fix any overhead, profit or cost element of the Bid price or the Bid price of any Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Town of Bolton (Owner) or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

_____
(Title)

Subscribed and sworn to before me

this _____ day of _____, 20____

_____

_____
(Title)

My Commission Expires _____.

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

NOTICE OF AWARD

Date of Issuance:

Owner: Town of Bolton | Owner's Contract No.:

Engineer: Nathan L. Jacobson & Associates, Inc. | Engineer's Project No.: 0963-0048

Project: Lori Road Drainage Repairs | Contract Name:

Bidder:

Bidder's Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated [_____] for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

_____ .

[describe Work, alternates, or sections of Work awarded]

The Contract Price of the awarded Contract is: $_____ *[note if subject to unit prices, or cost-plus]*.

[ ]unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically. *[revise if multiple copies accompany the Notice of Award]*

☐ a set of the Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner [____] counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security *[e.g., performance and payment bonds]* and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner**:**

_____

Authorized Signature

By:

Title:

Copy: Engineer

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

NOTICE TO PROCEED

Owner:	Town of Bolton	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Nathan L. Jacobson & Associates, Inc.	Engineer's Project No.:	0963-0048
Project:	Lori road Drainage Repairs	Contract Name:	
		Effective Date of Contract:	

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [_____, 20__].

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, [the date of Substantial Completion is _____, and the date of readiness for final payment is_____].

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner: Town of Bolton

Authorized Signature

By:

Title:

Date Issued:

Copy: Engineer

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

PERFORMANCE BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:
Town of Bolton, Connecticut
Bolton Town Hall
222 Bolton Center Road
Bolton, CT 06043

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*: Lori Road Drainage Repairs, Lori Road, Bolton, Connecticut

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

1. The Contractor and 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 when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. 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;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. 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:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 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 a contractor selected with the Owners 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 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven 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 Paragraph 5.4, and the Owner refuses the payment 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.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, 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. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 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 5; and

7.3 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.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. 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, successors, and assigns.

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

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.

11. 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 a declaration of 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 periods of limitations 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 page on which their signature appears.

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 herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 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 for the Contractor for 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.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:
Town of Bolton, Connecticut
Bolton Town Hall
222 Bolton Center Road
Bolton, CT 06043

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description: Lori Road Drainage Repairs, Lori Road, Bolton, Connecticut

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

EJCDC® C-615, Payment Bond
Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

1. The Contractor and 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, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

    5.1 Claimants who do not have a direct contract with the Contractor,

        5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

        5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

    5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

    7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

    7.2 Pay or arrange for payment of any undisputed amounts.

    7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. 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 Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. 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 the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. 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.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, 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.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. 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 herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **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 Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the 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.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default**: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

Copyright © 2013 National Society of Professional Engineers, American Council of Engineering Companies, and American Society of Civil Engineers. All rights reserved.

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:	Town of Bolton	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Nathan L. Jacobson & Associates, Inc.	Engineer's Project No.:	0963-0048
Project:	Lori Road Drainage Repairs	Contract Name:	

This [preliminary] [final] Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work shall be as provided in the Contract, except as amended as follows: *[Note: Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.]*

Amendments to Owner's responsibilities: ☐ None ☐ As follows

Amendments to Contractor's responsibilities: ☐ None ☐ As follows:

The following documents are attached to and made a part of this Certificate: *[punch list; others]*

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract.

EXECUTED BY ENGINEER:	RECEIVED:	RECEIVED:
By: _____ (Authorized signature)	By: _____ Owner (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____

Work Change Directive No. _____

Date of Issuance:	Effective Date:
Owner:	Owner's Contract No.:
Contractor:	Contractor's Project No.:
Engineer:	Engineer's Project No.:
Project:	Contract Name:

Contractor is directed to proceed promptly with the following change(s):

Description:

Attachments: *[List documents supporting change]*

Purpose for Work Change Directive:

Directive to proceed promptly with the Work described herein, prior to agreeing to changes on Contract Price and Contract Time, is issued due to: *[check one or both of the following]*

☐ Non-agreement on pricing of proposed change.

☐ Necessity to proceed for schedule or other Project reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price $ [increase] [decrease].

Contract Time days [increase] [decrease].

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price

☐ Cost of the Work ☐ Other

RECOMMENDED:	AUTHORIZED BY:	RECEIVED:
By:	By:	By:
Engineer (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title:	Title:	Title:
Date:	Date:	Date:

Approved by Funding Agency (if applicable)

By: Date:

Title:

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Change Order No. _____

Date of Issuance:		Effective Date:	
Owner:	Town of Bolton, CT	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Nathan L. Jacobson & Associates, Inc.	Engineer's Project No.:	0963-0048
Project:	Lori Road Drainage Repairs	Contract Name:	Same as Project

The Contract is modified as follows upon execution of this Change Order:

Description:

Attachments: *[List documents supporting change]*

CHANGE IN CONTRACT PRICE	**CHANGE IN CONTRACT TIMES** *[note changes in Milestones if applicable]*
Original Contract Price: $_____	Original Contract Times: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: $_____	[Increase] [Decrease] from previously approved Change Orders No. ___ to No. ___: Substantial Completion: _____ Ready for Final Payment: _____ days
Contract Price prior to this Change Order: $_____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
[Increase] [Decrease] of this Change Order: $_____	[Increase] [Decrease] of this Change Order: Substantial Completion: _____ Ready for Final Payment: _____ days or dates
Contract Price incorporating this Change Order: $_____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for Final Payment: _____ days or dates

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____	By: _____	By: _____
Engineer (if required)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Title: _____	Title _____	Title _____
Date: _____	Date _____	Date _____

Approved by Funding Agency (if applicable)

By: _____ Date:

Title: _____

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

Field Order _____

Date of Issuance:		Effective Date:	
Owner:	Town of Bolton, CT	Owner's Contract No.:	
Contractor:		Contractor's Project No.:	
Engineer:	Nathan L. Jacobson & Assoc., Inc.	Engineer's Project No.:	0963-0048
Project:	Lori Road Drainage Repairs	Contract Name:	Same as Project

Contractor is hereby directed to promptly execute this Field Order, issued in accordance with General Conditions Paragraph 11.01, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference: _____ Specification(s) _____ Drawing(s) / Detail(s)

Description:

Attachments:

ISSUED:	RECEIVED:
By: _____ Engineer (Authorized Signature)	By: _____ Contractor (Authorized Signature)
Title: _____	Title: _____
Date:	Date:

Copy to: Owner

SECTION 01 00 50 - SPECIFICATION FORMAT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section generally describes the Contract Document Specification format and is provided as a supplementary aid.

B. This Section identifies the Standard Specifications.

1.02 GENERAL FORMAT

A. The Specifications are arranged generally according to the Construction Specifications Institute (CSI) format.

B. Most technical and construction related requirements are specified in the technical sections, which are grouped by CSI into fifty (50) major divisions according to trade or type of work. All major divisions may not be utilized on any particular contract.

C. Technical sections are arranged in numerical order; however, section numbers may not be consecutive from section to section.

D. Most sections are generally broken down into three parts:

1. PART 1 - GENERAL
2. PART 2 - PRODUCTS
3. PART 3 - EXECUTION

E. Paragraph designations are subordinate to each part.

F. The format described hereinabove is general and flexible in nature. Some overlapping of information between the various portions of the Specifications. In all cases, the entire requirements of the Contract Documents, as a whole, apply and shall be met.

1.03 EXPLANATIONS

A. Descriptions - Technical sections typically begin with a paragraph entitled "SECTION INCLUDES", "SCOPE", or similar wording. This paragraph provides a brief non-inclusive description of the work generally specified in that Section. Requirements of the entire Contract Documents apply, whether or not specifically mentioned in said descriptions.

B. Related Requirements - Technical sections may provide a list of other specifications that may contain work closely related to the specified work. Such listings are non-inclusive.

C. These specifications are written in imperative mood. This imperative language is directed to the Contractor, unless specifically noted otherwise.

1.04 STANDARD SPECIFICATIONS

A. The Standard Specifications referred to in this Contract Document shall be the Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 818, 2020, as amended to date in the Specifications for this contract. Unless otherwise noted, only the "Materials" and/or "Construction Methods" portions of the Standard Specifications shall apply, including such supplements or amendments thereto

included herein. Within the referred to portions of the Standard Specifications wherein the following terms are used, such terms shall mean respectively:

Terms Used	Meaning for this Contract
Owner and/or State	Town of Bolton, Connecticut
Engineer	Nathan L. Jacobson & Associates, Inc.

1.05 DEFINITIONS

A. "Typical" means representative or indicative of features or work shown elsewhere but not specifically called out. Where an item of work is identified as "typical", such work shall apply to all such similar instances whether specifically identified or not.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work in general.

B. Work by others.

C. Contractor's use of site.

D. Owner occupancy.

1.02 WORK IN GENERAL

A. The Work to be performed consists principally of the removal and replacement of existing storm drainage and structures, along with site restoration.

1.03 WORK BY OTHERS

A. The Owner will perform or coordinate others to perform the work identified on the Drawings as "By Others" or "Not in Contract".

1.04 CONTRACTOR'S USE OF SITE

A. Access to site – Lori Road and Valerie Road.

B. Construction staging - If needed, the Contractor shall be responsible for securing such areas and making his own agreements with the owner on whose property the construction staging will take place.

C. Hours for construction operations shall be limited to 7:00 AM to 5:00 PM Monday through Saturday.

D. Existing Utilities

1. Obtain written authorization of the utility service recipients prior to interrupting a utility service.

2. Contact utility owners to coordinate the relocation/protection of their utilities on the Project site a minimum of two weeks prior to the start of any work on the Project involving their utilities. The Contractor is responsible for coordination of utility work and its integration with the overall project schedule, so as not to delay the progress of the Work.

3. Various underground and overhead utilities may be located within and adjacent to the Contract area. In all cases, whether underground structures have or have not been delineated, the Owner and Engineer accept no responsibility for their location and such locations as shown on the Drawings are to be considered approximate only.

4. Various overhead utilities lines may exist adjacent to the Contract area. The Contractor, prior to commencement of construction, shall take all appropriate safety steps to ensure that these lines are secured from contact or physical damage during construction unless otherwise provided for in the Contract Documents. Unless otherwise specifically provided

for, no additional compensation will be considered for any required relocation, temporary support, protection, or other costs involved with or about these facilities.

5. Contact "Call Before You Dig" (1-800-922-4455 or www.cbyd.com) prior initiating any subsurface work. Obtain subsurface survey investigation service from a qualified subcontractor to locate private underground utilities if present on-site. Maintain underground utility location markings. Notify utility company of any utility location markings that become removed during construction to replace markings.

6. Ensure that utility valve boxes and manholes are readily accessible at all times. Do not store materials over such facilities. Should it become necessary to cover boxes or manholes with spoil, devise a method for locating them quickly, and assist the utility company in uncovering them. All such facilities shall be left uncovered during non-working hours.

E. Phasing of the construction to facilitate minimal inconvenience to the traveling public may be indicated on the Drawings. If so, such phasing shall not be deviated from without prior approval of the Engineer.

F. Obtain written consent from private property owners prior to encroaching on any portion of their property beyond the temporary or permanent easement boundaries as defined by the Owner.

1.05 OWNER OCCUPANCY

A. The Owner may choose to occupy all or a portion of the nearly completed Project.

B. The opening of a roadway or parking area shall not be held to be in any way an acceptance of the Work, or any part of it, or as a waiver of any of the requirements of the Contract Documents as a whole. The opening of a roadway or parking area or portion thereof shall not constitute a basis for claims for damage due to interruptions to, or interference with, the Contractor's operations.

C. Necessary repairs on any section of a roadway or parking area due to its being opened to traffic under instructions from the Owner, pending completion of the Work, shall be performed at the expense of the Contractor - except that when damage was caused as a result of the Owner's equipment engaged in the control of snow and ice, the Contractor shall be reimbursed by the Owner. When the damage was caused by a traffic accident, the Contractor shall seek recovery from the responsible person through means available to him.

D. Cooperate with Owner to minimize conflict and to facilitate Owner's operations. Schedule the Work to accommodate this requirement.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 22 00 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE

A. This Section specifies measurement and payment requirements.

PART 2 MEASUREMENTS

2.01 MEASUREMENT REQUIREMENTS

A. Assist Engineer in performing required measurements. Allow for and afford the Engineer ample time, space and equipment to make measurements.

B. Notify Engineer, as far in advance as possible, of the making of measurements so that the Engineer may observe existing conditions, work being performed and measurements being made.

C. Notify Engineer where payments are anticipated by the Contractor for removing rock and existing materials. Upon notification the Engineer shall inspect, verify, and measure the materials to be removed.

D. Measurements for payment shall not exceed the limits shown on the Drawings or indicated in the Specifications, unless written approval is provided by the Engineer.

E. Provide weight slips to Engineer for deliveries where measurement for payment is on a weight basis. All deliveries shall be made on a state certified scale.

PART 3 PAYMENTS

3.01 PAYMENT REQUIREMENTS

A. Payments will only be made for pay items stipulated in the Bid. All costs in connection with the Work shall be included in one or more of the pay items.

B. Work requiring measurements will not be paid for without compliance, verified by the Engineer, to the Measurement Requirements specified in this Section and the measurement and payment requirements specified in the pay item's Specification Section.

C. No payments will be made for costs incurred by the Contractor that are associated with the repair or remediation of damages caused by the Contractor during construction operations.

END OF SECTION

SECTION 01 32 23 - FIELD ENGINEERING AND SURVEYS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes procedures and general requirements for preparing to install, erect, or apply products identified in the Work.

1.02 RELATED REQUIREMENTS

A. Section 01 78 39 - Project Record Documents

1.03 QUALITY ASSURANCE

A. Survey, layout, and related work shall be performed by persons fully qualified to do such work, as approved by the Engineer.

B. Replacement of property markers damaged or removed shall be performed under the direction of a land surveyor licensed in the Project's state.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide surveys, to the accuracy required by the Engineer, by regulatory agencies, or as required for the proper prosecution of the Work.

B. Materials shall be of good professional quality and in first-class condition.

2.02 MATERIALS

A. Furnish instruments, tapes, rods, measures, mounts and tripods, and other equipment required to perform the Work.

B. Provide stakes and hubs, nails, ribbons, other reference markers, and other materials required to perform the Work.

C. Lasers, transits, and other instruments shall be calibrated and maintained in accurate calibration.

PART 3 EXECUTION

3.01 GENERAL

A. Take extreme care to cause minimal to no disturbance to existing property and the landscape in general.

3.02 EXISTING MONUMENTS AND POINTS

A. Protect monuments, survey markers, and survey points and safe-guard against their displacement or removal.

B. Replace survey points that become accidentally or intentionally disturbed or removed during the Work.

3.03 LINES AND GRADES

A. Stake out the proposed Work and set grade stakes.

B. Preserve all stakes, benchmarks, nails and other markers, set or established along the line of the work.

C. Maintain grade lines throughout the duration of construction of pipe lines laid at specified gradient. When necessary to remove a grade marker for construction operations, maintain grade lines parallel with the trench extending along at least three grade markers.

D. Obtain working and construction lines and grades from these base lines and benchmarks shown on the Drawings.

E. Preserve marks given.

F. Reset marks if destroyed or removed without authority.

G. Work done without lines or levels or instructions shall be removed and replaced.

H. In conjunction with maintaining proper grades and alignment of the Work, the occasion may occur when batter boards, double side lines, or similar controls will be desired. In establishing these controls, only approved survey devices will be allowed. The use of a "line level" is not permitted.

I. Keep the Engineer informed of Work times and places in order that the Engineer may have an ample opportunity to furnish and/or to check the lines and elevations with a minimum of inconvenience to the Engineer or of delay to the Contractor.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes the types of submittals required, procedures for making submittals, the preparation of submittals, and the times submittals are required.

B. Additional submittals are required by the Information for Bidders, the General Conditions and the Supplementary Conditions. Such submittals generally include: Proposal and Bidding Documents; insurance policies; certification of bond and insurance coverage; applications for payment; requests for Change Orders; guarantees; permits; certifications and documents required by Federal, State and Local authorities; submittals required by utility companies and other persons, firms, or organizations; plans required by specifications; and other such submittals.

PART 2 SUBMITTALS

2.01 GENERAL

A. Submittals shall be complete, exact, neat, clear, and legible.

2.02 PRELIMINARY SCHEDULES

A. Provide a Progress Schedule and Schedule of Submittals.

1. Include in the Progress Schedule an estimated time for fabrication and delivery of the materials and equipment required for Work.
2. If the Work falls behind current Progress Schedule, submit revised schedule that adopts additional means and procedures in construction to make up time and assure Project completion by the time allotted in the Agreement.

2.03 SHOP DRAWINGS

A. Shop Drawings include certifications, product data, technical data, delegated designs, pre-driving documents, and test reports.

B. Include layout drawings when required for fabricated work, for manufactured items, and for other items specifically required by the Specifications.

C. Review shop drawings prepared by Subcontractors, suppliers, or manufacturers prior to submitting to the Engineer.

D. Certifications shall be properly authenticated by the written signature, in ink, of an owner, officer, or a duly authorized representative of the person, firm, or organization issuing such certification when requested in the Specification Section.

2.04 SAMPLES

A. Materials, supplies and equipment incorporated in the Work shall be in accordance with samples submitted by the Contractor and approved by the Engineer. The Engineer's approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and will not be for the purpose of checking

dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades or contractors or similar items.

B. Wherever the Specifications set forth or imply the performance required of any material, equipment or process; secure certificates from the manufacturer or supplier of the same certifying to the Contractor and the Owner jointly that the material, equipment or process will meet in every way the performance so required. Certificates must be turned over to the Engineer by the Contractor before approval will be given to the furnishing and installing of any such material, equipment, or process.

C. Materials specified by reference to the number or symbol of a specific standard, such as an ASTM Standard, a Federal Specification or other similar standard, shall comply with requirements in the latest revision thereof and any amendment or supplement thereto in effect on the date of the Advertisement for Bids, except as limited to type, class or grade, or modified in such reference. The standards referred to, except as modified in the Specifications, shall have full force and effect as though printed herein.

D. Materials incorporated in the Work shall be new, of standard and first grade quality, and of the best workmanship and design. No inferior or low-grade materials will be either approved or accepted, and work of assembly and construction must be done in a neat, first-class and workmanlike manner.

PART 3 SUBMITTAL PROCEDURES

3.01 GENERAL

A. Submit shop drawings and other submittals electronically as PDF files to the Engineer unless otherwise noted in the Specification Section or requested by Owner or Engineer. Alternatively, submit four (4) hard copies of paper submittals in place of electronic submittals.

B. Submit samples as indicated in the Specification Section.

C. Use a submittal sheet in the format provided by the Engineer with each submittal. Fill out the submittal sheet in its entirety. Omission of any information required on the submittal sheet is grounds for the submittal to be returned to the Contractor without review.

D. Include the Contractor's stamp of approval on Shop Drawings to comply with General Conditions Article 7.16.A.2. Indicate the Specification section, material, manufacturer's catalog numbers, and the use for which intended on each submittal. Samples not in compliance in this respect will be returned to the Contractor for proper resubmission without review.

E. Make submittals far enough in advance of anticipated dates, as presented in the Schedule of Submittals, for incorporation of that respective item into the Work, such that sufficient time is allowed for Engineer's review, resubmittals, and subsequent Engineer's reviews, ordering, manufacturing, fabrication, delivery, and preparation for installation or construction. No extension to the Contract time will be granted for failure of compliance in this respect.

3.02 SHOP DRAWINGS

A. The Engineer may hold Shop Drawings where a partial submission cannot be reviewed until the complete submission has been received or where Shop Drawings cannot be reviewed until correlated items affected by them have been received. When the Engineer holds up

such Shop Drawings, the Engineer shall so advise the Contractor in writing that the drawings submitted will not be reviewed until all related items have been received.

B. After review, the Engineer will stamp the Shop Drawing submittal "Approved," "Approved as Corrected"," Revise and Resubmit", or "Not Approved". The Engineer will return the reviewed Shop Drawing submittal electronically as a PDF file. In the case of a Shop Drawing which is reviewed and stamped "Revise and Resubmit" or "Not Approved" the Contractor shall make all indicated corrections and resubmit. The Contractor shall note on resubmission the changes from earlier submissions whether or not called for by the Engineer.

C. If a Shop Drawing involves only a minor deviation from the requirements of the Contract Documents and such deviation is in the best interests of the Owner and does not involve a change in Contract Price or Contract Time, the Engineer may approve the drawing. The approval shall be general, shall not relieve the Contractor from his responsibility for adherence to the Contract Documents or for any error in the drawing.

D. Furnish to other Project Contractors as many additional copies of approved Shop Drawings, machinery details, layout drawings, etc., as are necessary for the proper coordination of the Work.

E. The Engineer's review and approval of Shop Drawings shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents, and will not be for the purpose of checking dimensions, weights, clearances, fittings, tolerances, interferences, coordination of trades or contractors, or similar items. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. Further, approval by the Engineer of Shop Drawings shall not relieve the Contractor from responsibility for (1) errors of any sort in submittals; or (2) deviations from Drawings and Specifications unless the Contractor, at the time of submission, has given notice to the Engineer of any such deviations, flagged by marks and writing in red ink on the Shop Drawings or in an accompanying letter.

F. Material should not be purchased or fabricated for equipment or structures until the Engineer has reviewed the Shop Drawings, which shall represent all materials and equipment involved in the Work. No materials or equipment should be delivered to the site until the Shop Drawings have been approved. Any action by the Contractor contrary to the foregoing will be the Contractor's responsibility. Materials ordered or delivered to the site of the Work, prior to approval of the Shop Drawings by the Engineer, will be rejected by the Engineer should they prove unacceptable for the Work.

3.03 SAMPLES

A. Each manufacturer's or supplier's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer or supplier will be the material incorporated in the Work.

3.04 ATTACHMENT

A. Example of Contractor's Stamp of Approval

Contractor's Stamp of Approval

(Contractor's Name)

(Contractor's Name) certifies, to the Owner and Engineer, that it has either determined, checked and verified all quantities, dimensions, field measurements, field construction criteria, materials, catalog numbers and similar data, or assumes full responsibility for doing so, and has reviewed or coordinated this submittal with the requirements of the Work and the Contract Documents.

By: _____

Date:_____

Submittal No. _____

END OF SECTION

SECTION 01 45 00 - QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for testing to evaluate completed activities and elements for conformance with the requirements.

B. This Section supplements the various paragraphs of these Specifications that specify testing requirements.

1.02 SUBMITTALS

A. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Submit the preliminary design mix proposed to be used for concrete and other material mixes which require control by laboratory.

C. Submit a copy of each test and inspection report to Engineer. Each report shall include:

1. Date issued.
2. Project title and number.
3. Testing laboratory name, address and telephone number.
4. Name and signature of laboratory inspector.
5. Name, signature, and certification of responsible officer of testing agency.
6. Date and time of sampling or inspection.
7. Record of temperature and weather conditions.
8. Date of test.
9. Identification of product and Specification section.
10. Location of sample or test in the Work.
11. Type of inspection or test.
12. Results of tests and compliance with Contract Documents.
13. Interpretation of test results when requested by Engineer.

1.03 TESTING AGENCY QUALIFICATIONS

A. Test Agency shall:

1. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories;
2. Meet basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used in Construction";
3. Be authorized to operate in the state in which Project is located;
4. Be reputable, experienced, and capable of performing required tests.

B. Testing equipment:

1. Calibrated at reasonable intervals by devices of accuracy traceable to either:
   a. National Bureau of Standards.
   b. Accepted values of natural physical constants.

C. The on-site portion of the required concrete testing, such as taking cylinder samples, testing slump, etc., may be performed by qualified persons other than the testing agency. Said persons shall be qualified by the American Concrete Institute as a Concrete Field Testing Technician - Grade I.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Use extreme care with taking, storing, handling, and delivering samples and test specimens to avoid breakage, damage, and disturbance.

B. Deliver samples and test specimens to the laboratory or have the laboratory collect the samples and test specimens.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Engineer shall determine the following:

1. Number of samples to be taken;
2. Date and time samples will be taken and tests made;
3. Number and type of tests to be performed;
4. Who will collect the samples;
5. How the samples will be handled and stored;
6. When the laboratory is required at the site;
7. And the required qualifications of the laboratory's employee.

B. Engineer shall notify Contractor of the Engineer's decision to take samples and perform tests and provide the Contractor with pertinent information in this regard.

3.02 GENERAL

A. Employ the services of an independent testing laboratory to perform specified testing unless specified otherwise.

1. Obtain Owner approval of testing laboratory used to perform specified tests.
   a. Owner reserves the right to disapprove the use of a previously approved testing laboratory. Should this occur, dispense of the disapproved testing laboratory services and retain services from a testing laboratory approved by Owner.

B. Employment of the laboratory shall not relieve Contractor's obligations to perform the Work.

C. Inspections and tests required by laws, ordinances, rules, regulations, orders for approval of public authorities.

D. Provide own level of quality control. Tests called for in the Specifications shall not relieve the Contractor of this responsibility.

E. Cooperate with laboratory personnel and provide access to work.

F. Furnish incidental labor and facilities:

1. To provide access to work to be tested.
2. To obtain and handle samples at the Project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test sample.

G. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing, as ordered by the Engineer.

H. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

I. Notify Engineer at least 24 hours in advance of taking samples and performing tests.

J. Cooperate with Engineer; provide qualified personnel during all levels of backfilling.

K. Perform specified inspections, sampling, and testing of materials and methods of construction.

L. Comply with specified standards.

M. Ascertain compliance of materials with requirements of Contract Documents prior to incorporating material into the Work.

N. Promptly notify Engineer of observed irregularities or deficiencies of work or products.

O. Perform additional tests as required by Engineer or the Owner.

P. Replace materials found defective through visual inspection by the Engineer regardless of test or analysis results performed by independent or mill agency. Independent or mill agencies shall perform tests and analyses in accordance with the applicable ASTM standards and be supplemented by visual inspection.

Q. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.
3. Perform any duties of the Contractor.

END OF SECTION

SECTION 01 51 00 - TEMPORARY UTILITIES

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section includes procedures and requirements for installation, maintenance, and removal of temporary utilities and facilities used during construction.

1.02 QUALITY ASSURANCE

A. Perform Work in accordance with the requirements of authorities having jurisdiction and as required by Federal, State, and Local laws, codes, regulations and ordinances, and these Specifications.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide products required to meet the conditions of Paragraph 1.02.A of this Specification.

2.02 SANITARY FACILITIES

A. Provide a toilet facility for personnel of the job, Owner, and Engineer. Maintain in a sanitary manner. Screen toilet facilities from public observation. Obtain Owner approval for the facilities location(s) and method of waste disposal. Connect toilet waste to existing sanitary facilities where available.

2.03 POTABLE WATER

A. Provide a potable drinking water supply for personnel of the job, Owner, and Engineer. Maintain in a sanitary manner.

2.04 WATER FOR CONSTRUCTION PURPOSES

A. Abide by the rules and regulations of regulatory agencies having jurisdiction and make arrangements to obtain water required for the Work.

2.05 POWER, LIGHTING, AND HEATING

A. Make arrangements for electric current or power required for the Work. Furnish temporary light and heat for such period of time and at such intensity or temperature as may be required for the proper protection and execution of the Work.

2.06 PARKING FACILITIES

A. Do not park in locations that will create a nuisance, unsafe, or hazardous conditions.

PART 3 EXECUTION

3.01 GENERAL

A. Provide and maintain all temporary utilities and facilities as necessary throughout the performance of the Work.

B. Meet all applicable requirements of regulatory agencies.

C. Remove temporary utilities and facilities when the need for them is gone. Restore disturbed areas.

END OF SECTION

SECTION 01 55 26 - MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes the requirements for maintenance and protection of traffic.

1.02 RELATED REQUIREMENTS

A. Section 32 17 24 - Traffic Signs

1.03 REFERENCE STANDARDS

A. Manual on Uniform Traffic Control Devices for Streets and Highways 2009 Edition (MUTCD), with subsequent revisions, published by the U.S. Department of Transportation, Federal Highway Administration.

B. AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", latest revision.

C. ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

D. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

E. ASTM D4956 - Standard Specification for Retroreflective Sheeting for Traffic Control.

1.04 SUBMITTALS

A. Delegated Design Submittal - Submit for approval a plan and a schedule of operation methods for detours to each governmental agency having jurisdiction over the roadway and the Engineer prior to implementation.

B. Training Certificates - Submit Trafficperson's (Flagger's) training certificate.

C. Construction signs and supports - Submit a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that construction signs and their supports (tested together) conform to NCHRP Report 350 (TL-3) or the AASHTO MASH for Category 2 Devices.

D. Construction barricades and drums - Submit a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the barricades comply with the requirements of NCHRP Report 350 (TL-3) or the AASHTO MASH for Category 2 Devices.

1.05 QUALITY ASSURANCE

A. Comply with the Manual on Uniform Traffic Control Devices, published by U.S. Department of Transportation, Federal Highway Administration.

B. Comply with Connecticut Department of Transportation "Traffic Control During Construction Operations". This Document is attached and made part of this Specification Section.

C. Comply with requirements of each governing agency having jurisdiction over the roadway for the maintenance and protection of vehicular and pedestrian traffic. Contact each governing agency having jurisdiction to ascertain requirements.

D. Maintain vehicular and pedestrian traffic, protect the public from damage to persons and property, and minimize inconveniences to the residents and businesses adjacent to the Work.

E. Provide public health, welfare, and convenience within Work areas. Ascertain, at least one (1) week prior to starting Work, the specific needs of individuals whose access to their homes or businesses may be hindered as a result of the Work. Make arrangements with health, safety and protective agencies to ensure emergency or accidental needs of seriously hampered individuals are cared for.

F. Conduct operations in a manner to ensure the safety of motorists, pedestrians, and workers. It is the Contractor's responsibility to maintain safe conditions within the Contract area.

G. The governmental agency having jurisdiction over Lori Road is the Town of Bolton.

1. The Town of Bolton contact person is:
   Mr. James Rupert, Town Administrator
   Town of Bolton
   222 Bolton Center Road
   Bolton, CT 06043
   (860) 649-8066, Ext. 6115
   jrupert@boltonct.gov

H. Obtain permits as required from agencies having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Provide materials and equipment necessary to maintain and regulate traffic. Temporary materials and equipment require approval from the governing agency having jurisdiction over the roadway. Temporary materials and equipment remains the property of the contractor.

B. Provide working crews with proper necessary tools to properly affect the Work.

C. Traffic Cones shall be:

1. Constructed of materials thick enough to withstand impact without damage to cones or vehicles.
2. Of sufficient mass or have bases to which ballasts may be added to assure they are not blown over or displaced by wind or passing vehicles.
3. Reflectorized by Type VI or Type IX Reflective Sheeting in accordance with Section 32 17 24.

D. Traffic Drums shall be:

1. Manufactured of plastic or rubber devices in accordance with the latest MUTCD and designed to allow the installation of barricade warning lights.
2. Stabilized with the use of sandbags or other approved methods.
3. Reflectorized by Type IX Reflective Sheeting in accordance with Section 32 17 24.

E. Construction signs shall consist of the following materials:

1. Construction signs and appurtenances shall conform with Section 32 17 24.

2. Mesh, non-rigid, roll-up, corrugated, or waffle board types substrates, foam core and composite aluminum sign substrates are not permitted for use.

F. Construction barricades shall consist of the following materials:

1. The frame shall be of polyvinyl chloride pipe conforming to ASTM D2241 for PVC 1120 or 1220, SDR21 (pressure rating 200 psi (1380 kPa)); ASTM D3034, SDR 35 or an approved equal. All straight members shall be of white color.
2. Wyes, tees and elbows for joint connections shall be polyvinyl chloride of suitable size and strength for the purpose intended.
3. Joints shall not be glued and a 3/16 in (5.0 mm) nylon rope (or equivalent) shall be threaded loosely through the pipe to keep sections from flying if hit by a vehicle.
4. Face panels used as horizontal members shall be constructed of a suitable plastic material, 0.060-inch high impact styrene, anodized aluminum of no less than 0.025-inch thickness or a comparable substitute approved by the Engineer.
5. All hardware shall be in accordance with standard commercial specifications and shall be approved by the Engineer.
6. Alternate stripes of white and orange Type IV or Type IX retroreflective sheeting applied to the horizontal members shown on the Drawings. Only one type of sheeting shall be used on a barricade and all barricades furnished shall have the same type of reflective sheeting. Retroreflective sheeting materials shall appear on the Connecticut Department of Transportations' Qualified Product List for the application intended and shall be in accordance with ASTM D4956.
7. Construction barricades shall be designed and fabricated to prevent them from being blown over or displaced by the wind from passing vehicles.

G. Barricade warning lights are portable, lens-directed, enclosed lights. The color of the light emitted shall be yellow. They may be used in either a steady-burn or flashing mode. Barricade warning lights shall be in accordance with the requirements of the ITE Standard for Flashing and SteadyBurn Barricade Warning Lights and the following table:

	Type A Low Intensity	Type B High Intensity	Type C SteadyBurn
Lens Directional Faces	1 o 2	1	1 or 2
Flash Rate per minute	55 to 75	55 to 75	Constant
Flash Duration	10%	8%	Constant
Minimum Effective Intensity [1]	4.0 Candelas	3.5 Candelas	-
Minimum Beam Candelas [2]	-	-	2 Candelas
Hours of Operation	Dusk to dawn	24 hours per day	Dusk to dawn

[1] Length of time that instantaneous intensity is equal to or greater than effective intensity.

[2] These values must be maintained within a solid angle 9° on each side of the vertical axis and 5° above and 5° below the horizontal axis.

2.02 TRAFFICPERSON

A. Uniformed Flagger (Trafficperson) shall:

1. Be uniformed flaggers who have successfully completed flagger training by the American Traffic Safety Services (ATSSA), National Safety Council (NSC), or other such training approved by the Engineer.

2. Comply with Chapter 6E, Flagger Control in the Manual of Uniformed Traffic Control Devices (MUTCD) requirements for conduct and credentials.
3. Wear high-visibility safety apparel compliant with OSHA, MUTCD, and ASTM standards. The safety garment shall have the words "Traffic Control" printed in a minimum of 2" high letters clearly visible on the front and rear panels. Worn or faded garments that are no longer visible shall not be used.
4. Use a STOP/SLOW paddle that is at least 18 inches wide with letters at least 6 inches high. The paddle shall be mounted on a pole that measures 6 feet from the ground to the bottom of the sign.
5. Not work more than 12 hours in any one 24 hour period.

2.03 TRAVEL WAY

A. The travel way is a surface that is safe and wide enough for vehicular traffic. It shall be marked with signs, delineation, and other methods such that a person who has no knowledge of the conditions may safely travel through or avoid portions of the Work under construction with minimum discomfort.

B. The travel way shall be well-drained, reasonably smooth, hard, and free of potholes, bumps, irregularities, and depressions that hold water. It shall be free of foreign objects such as rocks, timber, and other items that may fall from transporting vehicles.

PART 3 EXECUTION

3.01 GENERAL

A. Comply with attached document "Traffic Control During Construction Operations".

B. Comply with the latest edition of the MUTCD.

C. Furnish and erect a sufficient number of signs, barricades, drums, traffic cones, and delineators to forewarn traffic of the construction. Provide such safety measures, pavement markings, warning devices, and signs as deemed necessary to safeguard and guide the traveling public through the work area as directed by the authority having jurisdiction and in accordance with the ATSSA guidelines.

D. Do not use unapproved signs, barricades, drums, traffic cones, or delineators.

E. Mount signs in any one signing pattern at the same height above the traveled surface. Keep signs in proper position, clean, legible, and in clear view. Remove or cover legend of signs that do not reflect the current existing travel conditions.

F. Remove, store, protect, keep clean, and replace existing street signs as directed by Engineer. Deliver discarded signs not to be replaced to the Owner as directed by the Engineer. Replace signs or markers lost or damaged resulting from Contractor's negligence at the Contractor's expense. Maintain route marker. Ensure signs remain visible to traffic if construction stages require sign relocation.

G. Backfill open trenches before the end of the workday unless written approval from Engineer is obtained.

3.02 TRAFFICPERSON

A. Provide Trafficperson(s) within the limits of construction in order to assist public travel safely through areas affected by Project construction.

3.03 TRAVEL WAY

A. Provide a travel way suitable to accommodate at least one lane of alternating traffic on Lori Road. Limit one lane of alternating traffic to the immediate work area for the shortest possible time period.

B. Remove immediately any spillage of material from a carrying vehicle resulting from the Contractor's hauling operations along or across any public travel way.

C. Ensure minimum traffic delays.

D. Maintain adequate ingress and egress for pedestrian and vehicular traffic to and from private driveways, business and commercial establishments, and for street intersections and heavily traveled crossings.

E. Grade and stabilize travel ways temporarily located outside accustomed traffic lanes to ensure these locations will satisfactorily carry the traffic.

3.04 TRAVEL WAY DELINEATION

A. Furnish a sufficient number of traffic drums to fulfill all the requirements specified in the Contract to provide adequate traffic control during period of unforeseen circumstances or emergencies.

B. Furnish and securely mount barricade warning lights as follows:

1. Type A -on separate portable supports, Class II barricades, and vertical channelizing devices. Portable supports shall be a minimum mounting height of 36 inches.
2. Type B - on advance warning signs, independent supports, and, in extremely hazardous site conditions, they may be mounted on Class II barricades, signs or supports.
3. Type C - to delineate the travel way edge on detour curves, lane changes, lane closures, and other similar conditions.
4. Or as directed by Engineer.

3.05 RESTORATION

A. Replace barricade warning lights and drums that are missing, damaged, defaced, or improperly functioning as determined by the Engineer and in accordance with ATSSA guidelines.

B. Replace damaged, obliterated, destroyed, or disturbed facilities with equal or better quality products.

C. Restore roadway striping obliterated during construction.

D. Restore and repair travel ways located outside accustomed traffic lanes to equal or better than original conditions when the temporary travel way is removed, unless otherwise shown on the Drawings.

E. Repair or replace traffic signal wires, pressure pads, magnetic loops, and other traffic signal devices removed or damaged during the course of construction. Restore, repair, and replace in accordance with the governmental agency having jurisdiction over the roadway requirements.

3.06 MAINTENANCE

A. Provide material, labor and equipment to immediately repair, remedy and prevent washouts, formation of holes, ruts, depressions, and sunken trenches during construction times, nights, weekends, holidays and times when Work is temporarily suspended.

B. Keep the travel way free of foreign objects such as rocks, timber and other items that may fall from transporting vehicles. Immediately remove spillage from a Contractor's hauling operations along or across public travel ways.

C. Maintain and relocate barricade warning lights. Dispose of them upon final removal.

3.07 ATTACHMENTS

A. Select pages from Connecticut Department of Transportation, Bureau of Engineering and Construction, Special Provision Item #0971001A - "Traffic Control during Construction Operations", Rev. 10/14. Where reference is made to "DOT Construction" it shall mean the "Engineer". Where reference is made to "District Engineer", "Office of Construction", or "District Office", it shall mean the "Owner".

END OF SECTION

TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

Speed and volume of traffic
Duration of operation
Exposure to hazards

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pot hole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate trafficperson shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

PLACEMENT OF SIGNS

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

SECTION 1. WORK ZONE SAFETY MEETINGS

1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project should be scheduled as needed.

1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda should include:

- Review Project scope of work and time
- Review Section 1.08, Prosecution and Progress
- Review Section 9.70, Trafficpersons
- Review Section 9.71, Maintenance and Protection of Traffic
- Review Contractor's schedule and method of operations.
- Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
- Open discussion of work zone questions and issues
- Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

SECTION 2. GENERAL

2.a) If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.

2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.

2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.

2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

3.a) Lane Closures shall be installed beginning with the advanced warning signs and proceeding forward toward the work area.

3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advanced warning signs.

3.c) Stopping traffic may be allowed:

- As per the contract for such activities as blasting, steel erection, etc.
- During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation.
- To move slow moving equipment across live traffic lanes into the work area.

3.d) Under certain situations when the safety of the traveling public and/or that of the workers may be compromised due to conditions such as traffic volume, speed, roadside obstructions, or sight line deficiencies, as determined by the Engineer and/or State Police,

traffic may be briefly impeded while installing and/or removing the advanced warning signs and the first ten traffic cones/drums only. Appropriate measures shall be taken to safely slow traffic. If required, traffic slowing techniques may be used and shall include the use of Truck Mounted Impact Attenuators (TMAs) as appropriate, for a minimum of one mile in advance of the pattern starting point. Once the advanced warning signs and the first ten traffic cones/drums are installed/removed, the TMAs and sign crew shall continue to install/remove the pattern as described in Section 4c and traffic shall be allowed to resume their normal travel.

3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.

3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travelpath prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.

3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.

3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows should be employed (i.e.: curves, major ramps, etc.).

4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the Flashing Arrow.

4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.

4.d) The Flashing Arrow board display shall be in the "arrow" mode for lane closure tapers and in the "caution" mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the "caution" mode when it is positioned in the closed lane.

4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

SECTION 5. USE OF TRUCK MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)

5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.

5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to utilize the TMAs.

5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA should be in the "flashing arrow" mode when taking the lane. The sign truck and workers should be immediately ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA should be in the "caution" mode when traveling in the closed lane.

5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The flashing arrow board mounted on the TMA should be in the "caution" mode when in the closed lane.

5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled "Type 'D' Portable Impact Attenuation System". Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) should be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.

5.f) TMAs should be paid in accordance with how the unit is utilized. When it is used as a TMA and is in the proper location as specified, and then it should be paid at the specified hourly rate for "Type 'D' Portable Impact Attenuation System". When the TMA is used as a Flashing Arrow, it should be paid at the daily rate for "High Mounted Internally Illuminated Flashing Arrow". If a TMA is used to install and remove a pattern and then is used as a Flashing Arrow, the unit should be paid as a "Type 'D' Portable Impact Attenuation System" for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove), and is also paid for the day as a "High Mounted Internally Illuminated Flashing Arrow".

SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES

6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.

6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.

6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.

6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

SECTION 7. USE OF (REMOTE CONTROLLED) CHANGEABLE MESSAGE SIGNS (CMS)

7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation, displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.

7.b) CMS should not be installed within 1000 feet of an existing CMS.

7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the CMS.

7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.

7.e) When the CMS are no longer required, they should be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.

7.f) The CMS generally should not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).

7.g) The CMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).

7.h) Messages that need to be displayed for long periods of time, such as during stage construction, should be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.

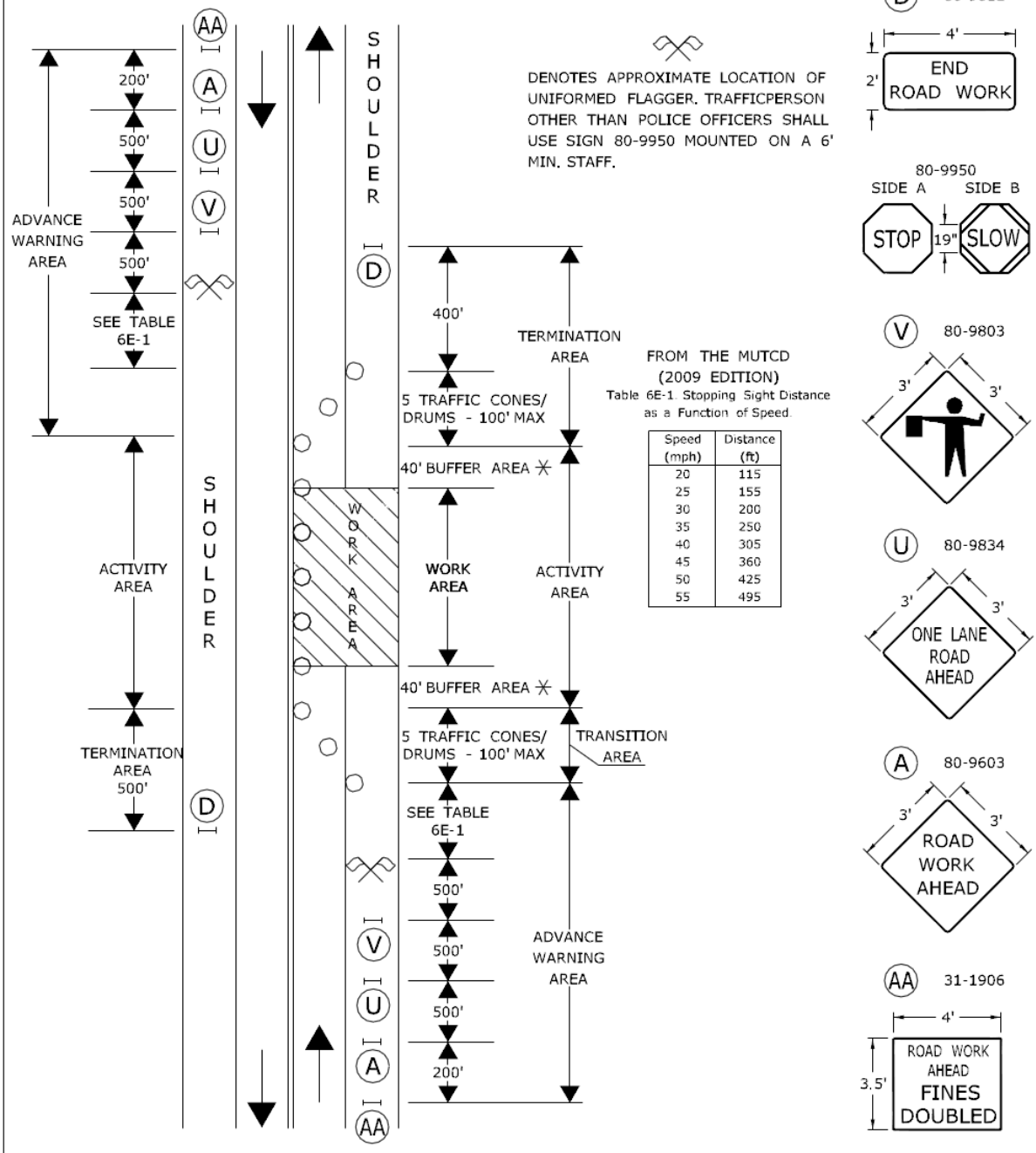
7.i) The messages that are allowed on the CMS are as follows:

Message No.	Frame 1	Frame 2	Message No.	Frame 1	Frame 2
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)



FROM THE MUTCD
(2009 EDITION)
Table 6E-1 Stopping Sight Distance as a Function of Speed

Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495

○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢ PORTABLE SIGN SUPPORT
⇐ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 1 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED _____ Charles S. Harlow 2012.06.05 15:55:23-04'00'
PRINCIPAL ENGINEER

WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.

B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.

C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.

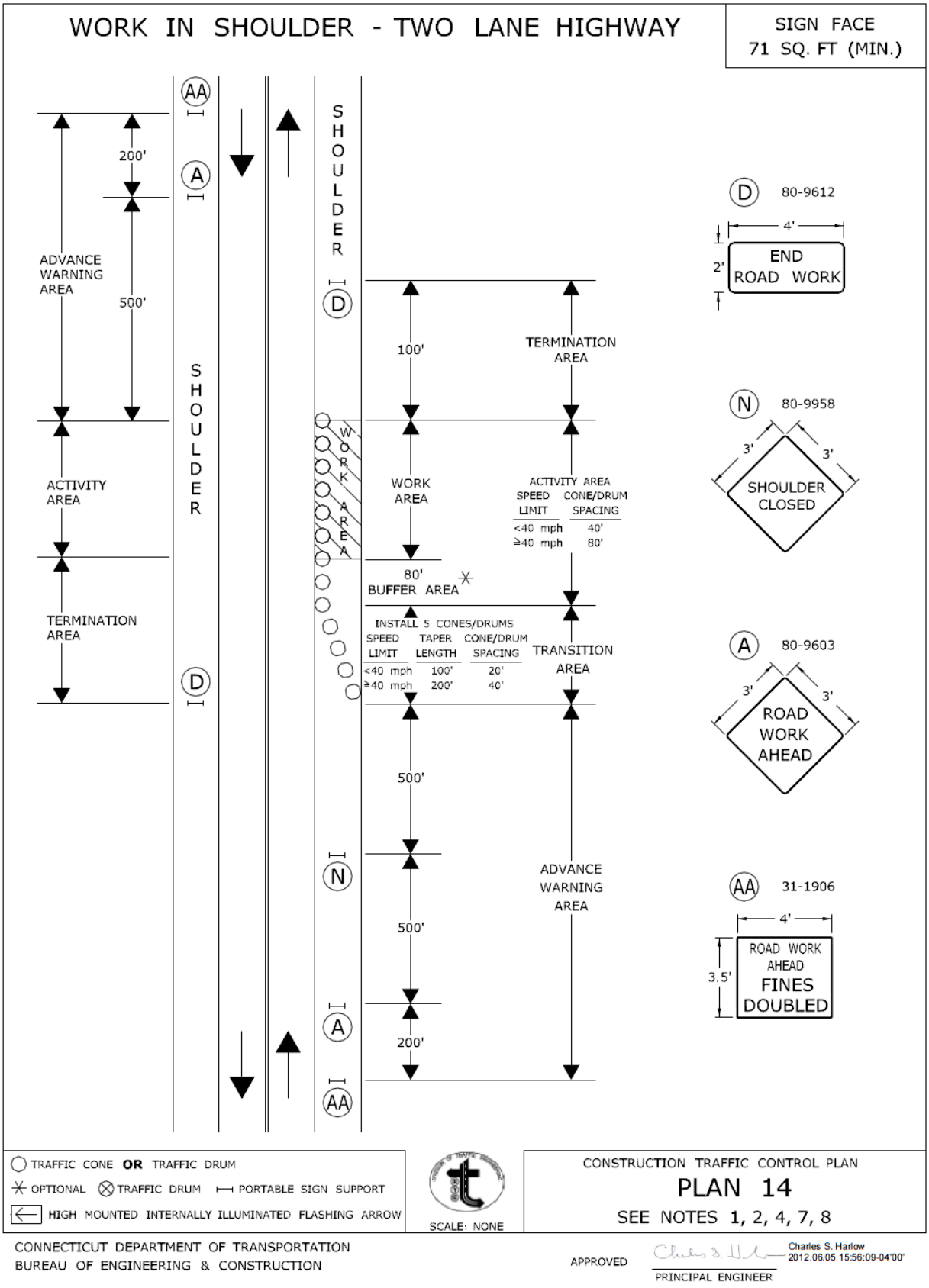
◯ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢⊣ PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

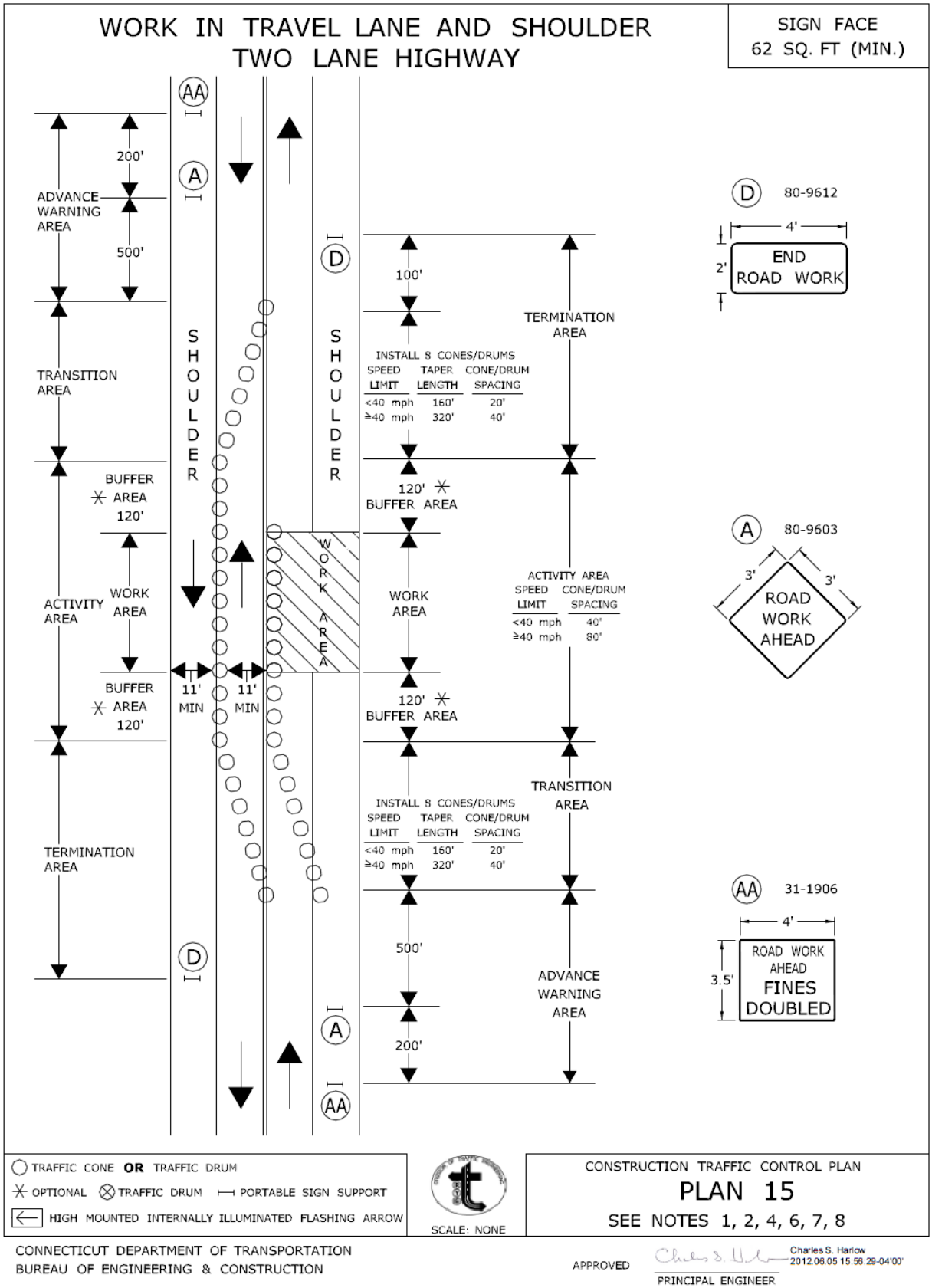
SCALE: NONE

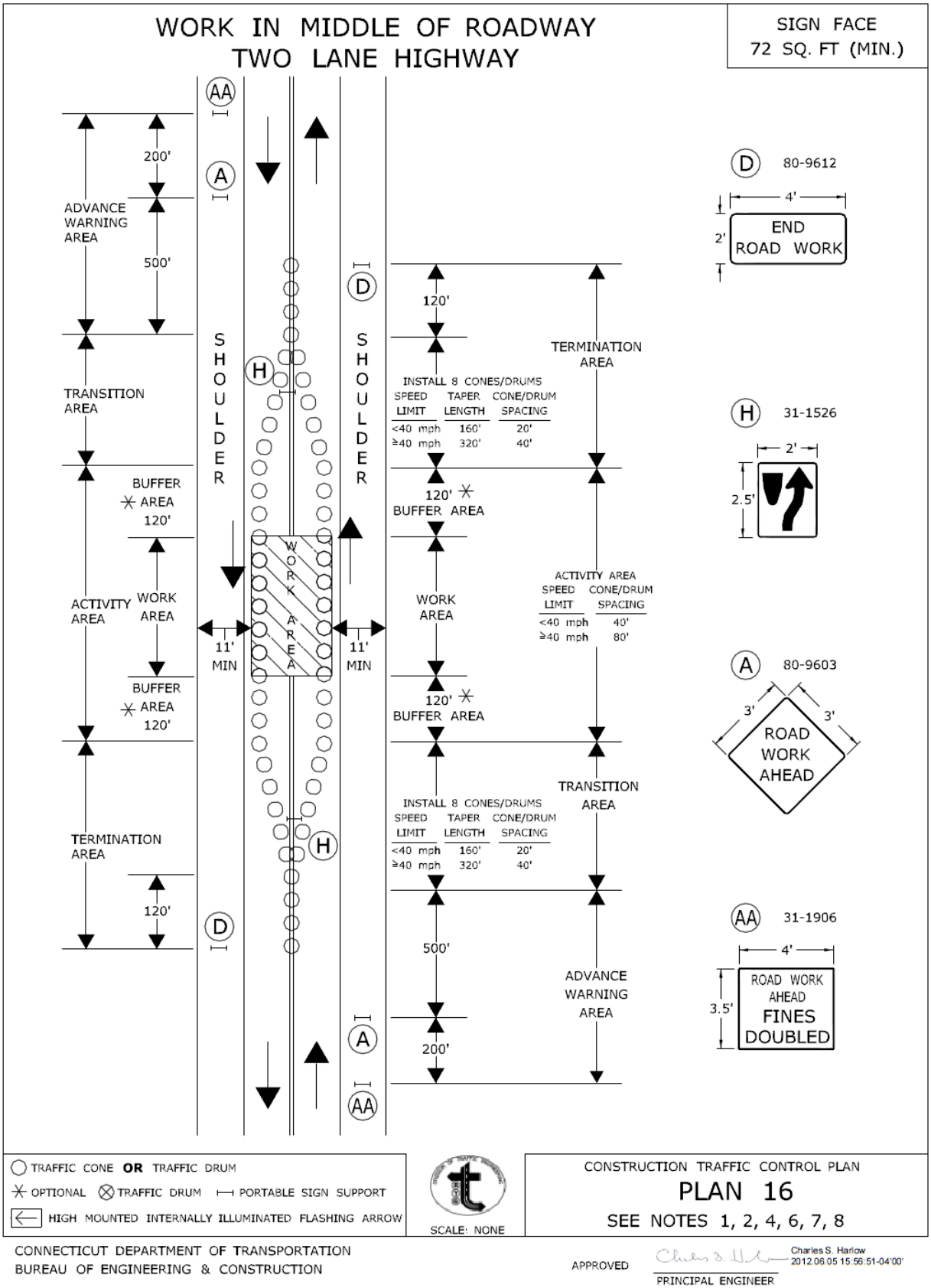
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 2 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

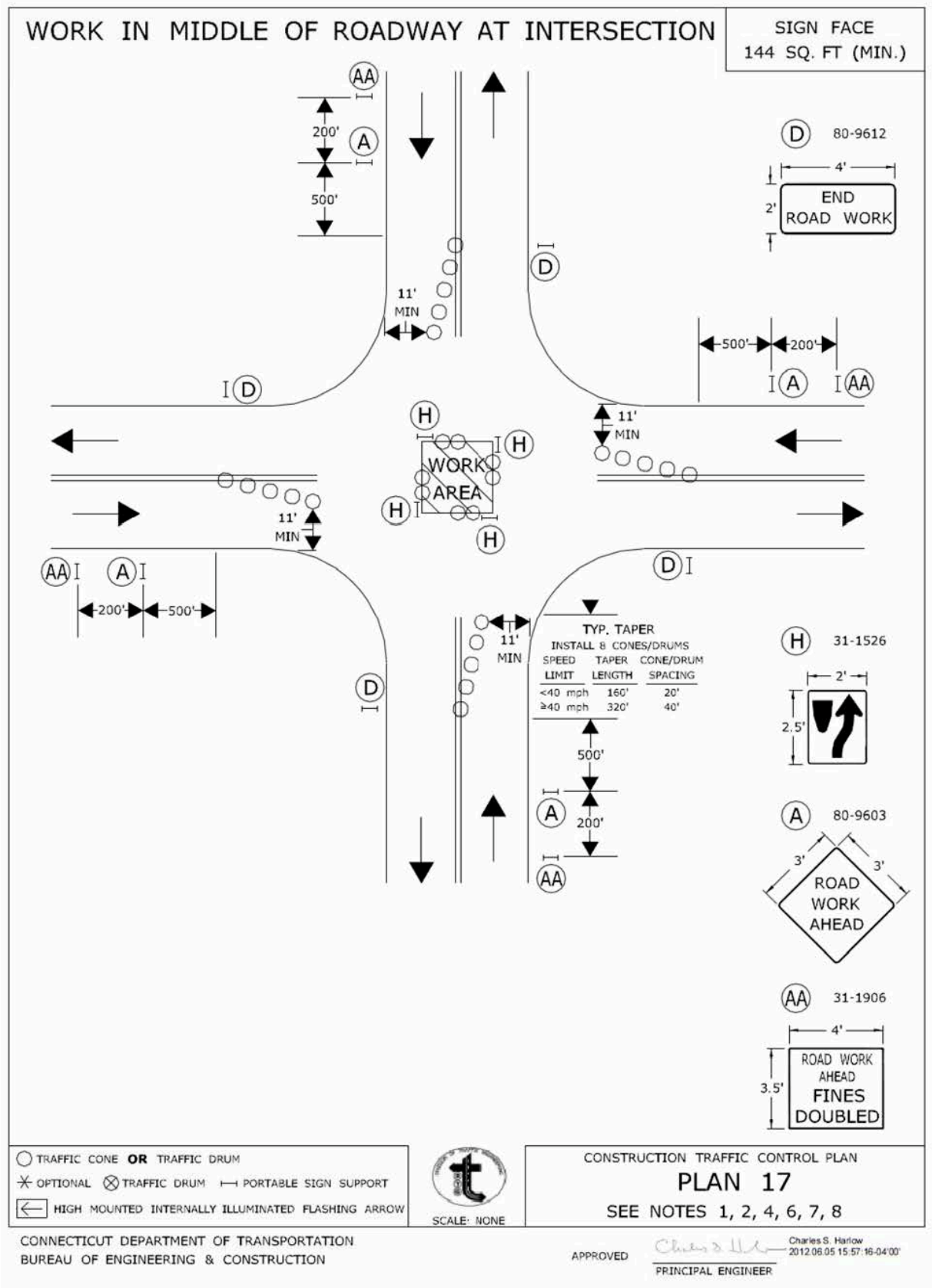
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:55:45-04'00'
PRINCIPAL ENGINEER


WORK IN SHOULDER - TWO LANE HIGHWAY
SIGN FACE
71 SQ. FT (MIN.)
AA
A
D
N
200'
500'
ADVANCE WARNING AREA
ACTIVITY AREA
TERMINATION AREA
SHOULDER
SHOULDER
WORK AREA
100'
TERMINATION AREA
WORK AREA
ACTIVITY AREA
SPEED LIMIT
CONE/DRUM SPACING
<40 mph 40'
≥40 mph 80'
80' BUFFER AREA
INSTALL 5 CONES/DRUMS
SPEED LIMIT
TAPER LENGTH
CONE/DRUM SPACING
<40 mph 100' 20'
≥40 mph 200' 40'
TRANSITION AREA
500'
ADVANCE WARNING AREA
500'
200'
D 80-9612
4'
2'
END ROAD WORK
N 80-9958
3'
3'
SHOULDER CLOSED
A 80-9603
3'
3'
ROAD WORK AHEAD
AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 14
SEE NOTES 1, 2, 4, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
Charles S. Harlow
2012.06.05 15:56:09-04'00'
PRINCIPAL ENGINEER


WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
SIGN FACE
62 SQ. FT (MIN.)
AA
A
D
200'
ADVANCE WARNING AREA
500'
TRANSITION AREA
BUFFER AREA 120'
ACTIVITY AREA
WORK AREA
BUFFER AREA 120'
TERMINATION AREA
SHOULDER
SHOULDER
11' MIN
11' MIN
WORK AREA
100'
TERMINATION AREA
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
120' BUFFER AREA
WORK AREA
ACTIVITY AREA
SPEED LIMIT | CONE/DRUM SPACING
<40 mph | 40'
≥40 mph | 80'
120' BUFFER AREA
TRANSITION AREA
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
500'
ADVANCE WARNING AREA
200'
D 80-9612
4'
2'
END ROAD WORK
A 80-9603
3'
3'
ROAD WORK AHEAD
AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL TRAFFIC DRUM PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 15
SEE NOTES 1, 2, 4, 6, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
Charles S. Harlow
2012.06.05 15:56:29-04'00'
PRINCIPAL ENGINEER


WORK IN MIDDLE OF ROADWAY
TWO LANE HIGHWAY
SIGN FACE
72 SQ. FT (MIN.)
AA
A
D
H
200'
500'
ADVANCE WARNING AREA
TRANSITION AREA
BUFFER AREA 120'
ACTIVITY AREA
WORK AREA
BUFFER AREA 120'
TERMINATION AREA
120'
SHOULDER
SHOULDER
WORK AREA
11' MIN
11' MIN
120'
TERMINATION AREA
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
120' BUFFER AREA
WORK AREA
ACTIVITY AREA
SPEED LIMIT | CONE/DRUM SPACING
<40 mph | 40'
≥40 mph | 80'
120' BUFFER AREA
TRANSITION AREA
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
500'
ADVANCE WARNING AREA
200'
D 80-9612
4'
2'
END ROAD WORK
H 31-1526
2'
2.5'
A 80-9603
3'
3'
ROAD WORK AHEAD
AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 16
SEE NOTES 1, 2, 4, 6, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
Charles S. Harlow
2012.06.05 15:56:51-04'00'
PRINCIPAL ENGINEER


WORK IN MIDDLE OF ROADWAY AT INTERSECTION
SIGN FACE
144 SQ. FT (MIN.)
AA
200'
A
500'
11'
MIN
D
80-9612
4'
2'
END
ROAD WORK
500'
200'
H
WORK
AREA
TYP. TAPER
INSTALL 8 CONES/DRUMS
SPEED LIMIT
TAPER LENGTH
CONE/DRUM SPACING
<40 mph 160' 20'
≥40 mph 320' 40'
31-1526
2'
2.5'
80-9603
3'
ROAD
WORK
AHEAD
31-1906
ROAD WORK
AHEAD
FINES
DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 17
SEE NOTES 1, 2, 4, 6, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
Charles S. Harlow
2012.06.05 15:57:16-04'00'
PRINCIPAL ENGINEER

SECTION 01 57 00 - TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes procedures and requirements for temporary environmental controls during the Work.

B. Oil absorbent booms and blankets.

1.02 QUALITY ASSURANCE

A. Comply with the regulatory agencies having jurisdiction requirements. Failure to meet these requirements is sufficient grounds for suspension of the affected portion of the Work until such time as proper conditions are provided. No additional compensation or extension of time will be considered therefore.

1.03 SUBMITTALS

A. Certifications that materials proposed for use meet the requirements of this specification, unless otherwise approved by the Engineer.

B. Erosion and sediment control plan.

PART 2 PRODUCTS

2.01 GENERAL

A. Furnish equipment and materials required to execute water control, erosion control, dust control, noise control, and pollution control.

B. Furnish electronically driven equipment for night operations to the maximum extent possible to minimize noise.

2.02 MATERIALS

A. Oil absorbent booms and blankets - As manufactured by Sorbent Products, Inc., as distributed by Atlantic Environmental Corporation, Trumbull, Connecticut.

PART 3 EXECUTION

3.01 GENERAL

A. Provide and maintain temporary controls during construction.

B. Remove temporary controls and restore disturbed areas as the Work progresses and when the need for such controls no longer exists.

C. Maintain oil absorbent booms and blankets on Project site.

3.02 POLLUTION CONTROL

A. Do not permit pollutants such as chemicals, fuels, lubricants, solvents, sewage, water containing sediments, and other deleterious, poisonous, toxic, or oxygen demanding substances to enter streams, lakes, other surface waters, or into the groundwater.

B. Do not store, service, refuel, wash, or flush out vehicles in locations where leaks, spillage, waste materials, cleaners, or waters will be introduced into the soil, or flow into storm drains, wetlands, or watercourses. Immediately notify the Owner, Engineer, and the local water company of any containment spills.

C. Remediate surface and ground waters damaged by construction operations to the satisfaction of the Owner, Engineer and the local water company.

3.03 FLOOD CONTROL

A. Take necessary precautions and furnish equipment required to handle water, sewage, storm, seepage, surface, and flood flows which may be encountered during construction and assume associated costs.

B. Provide for all water courses interrupted or rerouted during the progress of the Work.

3.04 EROSION CONTROL

A. Take necessary measures to keep ground surface well drained, but in a manner to avoid erosion of embankments, excavations, the job site and public and private property.

B. Provide excavation dewatering required for temporary control of erosion.

C. Provide control of sedimentation from dewatering operations by the proper installation and maintenance of sediment basins, hay bales, filter bags, and/or other means as approved by the Engineer.

D. Do not directly discharge dewatering operations to any wetlands, streams, storm drainage or any other surface water areas.

E. Do not discharge dewatering operations to a sanitary sewer system.

3.05 DUST CONTROL

A. Take the necessary measures to control dust resulting from the Work.

B. Whenever directed by the Engineer, immediately apply water, calcium chloride, or other approved means to control dust at locations and in such quantities and frequencies as required to prevent dust from becoming a nuisance to the surrounding area.

3.06 NOISE CONTROL

A. Maintain mufflers and noise control devices and replace when necessary. Operate construction equipment such that there will be a minimum amount of noise and vibration.

B. Use electronically driven pumps and other equipment during night operations to the maximum extent possible.

3.07 OIL ABSORBENT BOOMS AND BLANKETS

A. Continuously provide and maintain at each re-fueling area eighty (80) linear feet of new oil absorbent booms and four-hundred fifty (450) square feet of new oil absorbent blankets for the duration of the construction. As blankets and booms are used during the construction, the supply shall be continuously replaced, at all times maintaining the required quantity specified herein at each location.

END OF SECTION

SECTION 01 74 00 - CLEANING AND WASTE MANAGEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes requirements for maintaining the site in a neat and clean condition during construction and requirements for final clean up prior to final payment.

1.02 CLEANING UP AND REMOVAL OF DEBRIS

A. Clean up refuse, rubbish, excess or unused materials, scrap materials, and debris caused by construction operations at the end of each day and frequently enough to maintain a neat and orderly construction site.

B. Before final payment, remove surplus material, falsework, temporary structures and their foundations, and debris of every nature resulting from construction operations and put the site in a neat orderly condition.

C. Before final payment, restore material and equipment storage areas and areas disturbed by construction operations to the area's original condition, or to a condition satisfactory to and approved by the Owner.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

(Not Used)

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes the administration and procedural requirements for meeting satisfactory conditions for final inspection and acceptance of the Work.

1.02 QUALITY OF WORK

A. Turn Work over to the Owner in good operating condition upon completion. Make such adjustments in the Work, additional tests, and all else as may be necessary, in the opinion of the Engineer, in order that all parts of the Work covered by such Contract will operate together, properly, in accordance with the intent of the Contract Documents.

B. Upon completion of the Work and just prior to final inspection, clean up the site. The entire Project site, all areas that have been used for storage of materials and equipment and that have been disturbed by Contractor's operations and the Work, shall be in a clean and finished state.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 GENERAL

A. Furnish all labor, equipment, and materials required by Engineer to assist in the various types of inspections.

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section generally describes the requirements for Project Record Documents, including making of measurements, keeping of records and preparation of record documents of all work performed and all existing utilities and facilities encountered during the course of the Work.

1.02 PROJECT RECORD DOCUMENTS

A. Maintain and keep on-site, throughout the progress of construction, a set of current, detailed field record drawings, to scale, indicating significant deviations from the Drawings, Shop Drawings, and/or installation drawings, and exact location of concealed work, including underground utilities. This requirement does not authorize any deviations without approval of the Engineer.

1. The field record information shall be marked in a legible manner on prints of approved Shop Drawings and/or installation drawings furnished by the Contractor or, where such drawings do not apply, on prints of the Drawings furnished by the Engineer. The field information to be so marked shall include, but is not necessarily limited to:
   a. Significant deviations of any nature made during construction.
   b. Existing underground facilities encountered in the course of the Work.
   c. Proposed underground facilities installed and relocated within the Contract.

1.03 MEASUREMENTS

A. Conduct and record necessary measurements for Project Record Documents.

B. Take at least three (3) tying measurements for each facility location point from permanent physical objects. The location of all such measurements shall be as approved by the Engineer.

1.04 SUBMITTALS

A. Submit field record information marked on approved Shop Drawings and/or installation drawings and Contract Drawings to the Engineer upon completion of Work.

PART 2 PRODUCTS

(Not used)

PART 3 EXECUTION

(Not used)

END OF SECTION

SECTION 02 41 13 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Demolition work as shown on the Drawings.

1.02 REFERENCE STANDARDS

A. See Section 9.12 of the Standard Specifications in Section 34 71 24.

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations.

B. Use experienced workmen.

C. Protect new work and items to remain from damage during demolition.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove items as indicated on the Drawings. Preserve items to be reused or relocated. Deliver items reserved for the Owner to the designated storage location. All other items shall become the property of the Contractor for salvage or disposal in a lawful manner.

B. Remove pavement in area indicated on the Drawings.

C. Remove existing concrete and masonry to a minimum depth of two (2) feet below the proposed grade. Where new structures are to be installed in the same location, remove existing concrete and masonry completely.

D. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.

E. Maintain mailboxes for continuous mail delivery by the U.S. Postal Service. Comply with requirements of the U.S. Postal Service.

END OF SECTION

SECTION 31 10 00 - SITE PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and grubbing.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading

B. Section 31 25 00 - Soil Erosion and Sediment Control

1.03 QUALITY ASSURANCE

A. Comply with governing codes and regulations.

B. Use experienced workmen. Trimming of roots and branches shall be performed by or under the supervision of a licensed arborist.

PART 2 PRODUCTS

2.01 MATERIALS

A. Clearing and Grubbing - Provide materials necessary for the proper performance of this portion of the Work, including, but not limited to, tree wrappings, burlap, erosion, and other pollution control products.

PART 3 EXECUTION

3.01 PREPARATION

A. Verify limits of clearing and grubbing with the Engineer prior to proceeding with these operations.

B. Coordinate disturbance of items affecting traffic or security with Owner and Engineer. Provide Owner and Engineer with minimum two (2) weeks advance notice of such disturbance and provide Owner and Engineer with updates of work affecting traffic and security.

C. Consult with the Engineer ten (10) days prior to removing or disturbing any tree, shrub, fence, wall, sidewalk, building, structure, roof drain, foundation drain or improvement that may be encountered in the line of the Work, or in the path of an easement.

D. Delineate working areas to the extent of the easement boundaries in the field with snow fence or as directed by the Engineer. As work progresses, move or remove fence, Fill and tamp fence holes, and restore surfaces.

E. Trees, shrubs and other landscape features which do not interfere with the Work, or which are designated to be left-in-place, shall be protected from scarring, debarking or other injuries during construction operations. Snow fence shall be placed around trees, shrubs and other landscape features designated to remain, within the limits of the Work. If, during the prosecution of the Work, the Contractor damages trees or any part thereof, the treatment and

restoration of the trees shall be accomplished under the direction of a qualified nurseryman and, before acceptance of the Work, the Contractor shall furnish the Engineer with a certificate from the nurseryman stipulating that the trees have been properly cared for, treated and restored under his direction.

3.02 CLEARING AND GRUBBING

A. The use of explosives in clearing and grubbing operations is prohibited.

B. Formulate clearing and grubbing schedules to provide minimum practical exposure of soils. Progress work in a manner that will minimize erosion.

C. Coordinate tree disturbance within a public right-of-way or easements with the Town of Bolton. Post trees sufficiently in advance of required disturbance in accordance with State and local laws and ordinances. Coordinate construction activities and the overall project schedule with the posting period.

D. Clear only that portion of the site which is absolutely necessary and essential for construction in accordance with any approved staging plan. Limit clearing and grubbing to the minimum extent possible to properly install the Work. Do not exceed clearing limits shown on the Drawings, unless otherwise approved by the Engineer.

E. Cut and dispose of all trees, down timber, shrubs, brush, bushes, snags, debris, and other objectionable matter and materials in a legal manner off site.

F. Leave items affecting traffic, safety and security in place as long as possible and replaced as soon as possible when such items must be removed.

G. Remove, store, and protect fences, signs, and other items to be restored.

H. Remove, protect, and return items to be removed and returned to Owner.

I. Remove and dispose of off-site in a legal manner stumps, roots, grass, turf, sod, vegetation, walls, concrete foundations and slabs, abandoned utilities (pipes, cables, conduits and appurtenances), curbs, bituminous concrete, pipeguards, debris, and other objectionable matter, and materials. Remove all of above to depth at least twelve (12) inches below finish grade and to the extent necessary to not interfere with new construction.

J. Replace trees damaged by the Contractor within the same season the trees were damaged.

3.03 PROTECTION

A. Do not disturb trees, shrubs, or other vegetation unless approved by the Engineer.

B. Protect trees, lawns, and other features remaining as portion of final landscaping.

C. Protect bench marks, fences, roads, and existing structures which are to remain.

D. Protect above or below grade utilities which are to remain.

END OF SECTION

SECTION 31 22 00 - GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Topsoil stripping and stockpiling.

B. Subsoil stripping and stockpiling.

C. Grade to reshape contours.

1.02 RELATED REQUIREMENTS

A. Section 01 32 23 - Field Engineering and Surveys

B. Section 01 78 39 - Project Record Documents

C. Section 31 23 16 - Excavation

D. Section 31 23 17 - Rock Excavation

E. Section 31 23 23 - Backfilling

F. Section 31 23 33 - Trenching

G. Section 31 25 00 - Soil Erosion and Sediment Control

H. Section 32 92 00 - Turf Establishment

1.03 SUBMITTALS

A. Certification - Submit copy of "Call Before You Dig, Inc." notification.

1.04 CLOSEOUT SUBMITTALS

A. Record Documents - Submit in accordance with Section 01 78 39.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil - as defined in Section 32 92 00.

B. Subsoil - as defined in Section 31 23 23.

PART 3 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours and datum. Coordinate with Section 01 32 23.

B. Notify "Call Before You Dig, Inc." (1-800-922-4455 or www.cbyd.com).

C. Owner to identify known below-grade utilities. Contractor to stake and flag locations.

D. Identify and flag above-grade utilities.

3.02 TOPSOIL STRIPPING

A. Strip topsoil from areas to be further excavated, landscaped, or graded, and stockpile on site for later use.

3.03 SUBSOIL STRIPPING

A. Strip subsoil from areas to be landscaped or graded, and stockpile on site for later use.

B. Cut roots of trees to remain by hand with sharp axe. Apply pruning paint to cut ends of roots that are one (1) inch diameter and larger, otherwise apply wet burlap to prevent them from drying out.

3.04 STOCKPILES

A. Maintain stockpiles to heights and slopes while considering safety risks from instability and local land use regulations.

3.05 GRADING

A. Rough grade area in which subsequent related work is to be performed, and establish lines and grades as shown on the Drawings.

B. Fine grade working area to lines and grades shown on the Drawings after preceding Work is complete and backfilled.

C. Conform to Section 31 23 23 where filling is required to establish lines and grades.

D. Surplus materials - Conform to Section 31 23 16.

3.06 TOLERANCES

A. Top Surface of Subgrade - Plus or minus one (1) inch.

3.07 PROTECTION

A. Protect trees, lawns, and other features remaining as portion of final landscaping.

B. Protect bench marks, fences, and roads.

C. Protect above or below grade utilities which are to remain.

D. Use proper caution when excavating in and around utility service facilities. Machine excavation shall not come within eighteen (18) inches from the designated location of a utility line except for pavement materials when in a roadway. After locating and verifying the location of the utility line utilizing hand tools, the Contractor may proceed with the careful use of power equipment.

E. Notify utility owner if accidental contact to a known utility or an unknown underground facility is discovered. Protect utility and facilities as directed by utility owner.

END OF SECTION

SECTION 31 23 16 - EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All excavation except trenching.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading

B. Section 31 23 17 - Rock Excavation

C. Section 31 23 19 - Dewatering

D. Section 31 23 23 - Backfilling

E. Section 31 23 33 - Trenching

F. Section 31 25 00 - Soil Erosion and Sediment Control

1.03 MEASUREMENT AND PAYMENT

A. Compensation for excavating and disposing of excavated material as ordered by the Engineer beyond excavation limits shown on the Drawings or specified shall be at the unit price established in the Bid for ADDITIONAL EXCAVATION AS ORDERED BY THE ENGINEER (A.O.B.E.). Such compensation shall include all excavating, dewatering, hauling and disposing of material, removal of pavements, sheeting and bracing, and other work necessary and related thereto. Measurement for payment for this item will be the actual volume removed as measured in-place by the Engineer.

B. No measurement for payment will be made for excavation of material down to subgrade elevations shown on the Drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Subsoil - Comply with Section 31 23 23.

PART 3 EXECUTION

3.01 PREPARATION

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

B. Sawcut pavements to be removed as delineated on the Drawings or as directed by the Engineer. Sawcut paved surfaces in neat and straight joint lines with a device approved by the Engineer. Pavements to be removed may be sawcut in advance but shall not be removed until the Work is ready to be installed.

C. Rough grade to subgrade prior to excavating for structures.

D. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases. Repair damage caused by construction operations at no additional cost to Owner or owner of damaged structure, utility or pipe chase, as approved by owner of damaged structure, utility or pipe chase.

3.02 GENERAL

A. Carry excavations for structures to subgrade as applicable.

B. Notify Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work. Excavate unstable material, as ordered by Engineer, and replace with a layer of select fill materials as shown on the Drawings, as ordered by the Engineer.

C. Do not excavate below a two (2) horizontal to one (1) vertical line drawn outward and down from the bottom edge of a footing (footing splay line). Notify the Engineer if in the opinion of the Contractor, such a situation may occur. Provide sheeting and bracing in accordance with Section 31 50 00 as required.

D. Provide additional excavation and disposal as ordered by the Engineer (A.O.B.E.).

E. Grade excavation top perimeter to prevent surface water run-off into excavation.

F. Remove loose and disturbed rock to expose sound intact rock where Drawings call for footing bearing on sound bedrock.

G. Cut roots of trees to remain by hand with sharp axe. Apply pruning paint to cut root ends that are one (1) inch diameter and larger, otherwise apply wet burlap to prevent from drying out.

H. Remove and dispose of all surplus excavated materials off-site in a legal manner, unless otherwise directed by the Owner.

3.03 PROTECTION

A. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave-in or loose soil from falling into excavation and as required by all applicable local, State, and Federal safety regulations and codes.

B. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

C. Use proper caution when excavating in and around utility service facilities. Machine excavation shall not come within eighteen (18) inches from the designated location of a utility line except for pavement materials when in a roadway. After locating and verifying the location of the utility line utilizing hand tools, the Contractor may proceed with the careful use of power equipment.

D. Notify utility owner if accidental contact to a known utility or an unknown underground facility is discovered. Protect utility and facilities as directed by utility owner.

END OF SECTION

SECTION 31 23 19 - DEWATERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering operations.

1.02 RELATED REQUIREMENTS

A. Section 01 57 00 - Temporary Controls

B. Section 31 23 16 - Excavation

C. Section 31 23 23 - Backfilling

D. Section 31 23 33 - Trenching

E. Section 31 25 00 - Soil Erosion and Sediment Control

1.03 REGULATORY REQUIREMENTS

A. Conform to all Federal, state, and local laws, ordinances and permits for the manner in which excavations and trenches are dewatered and water disposed.

B. Ascertain the complete extent of all permits required governing dewatering operations, and be bound by their conditions and provisions.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide the equipment and materials necessary to perform dewatering operations in accordance with this Specification.

PART 3 EXECUTION

3.01 PERFORMANCE

A. Dispose of water removed from the trenches or excavations by pumping, bailing, siphoning, well-points, or other means in such a manner so as to avoid interference with business, pedestrian, and vehicular traffic, and to prevent damage to persons or property.

B. Depress groundwater encountered within the limits of excavation to an elevation not less than six (6) inches below the limits of the excavation bottom before laying pipe or starting concrete work, unless otherwise permitted by Engineer. Maintain this groundwater's depressed elevation until concrete and joint material have attained adequate strength.

C. Discharge water removed from the excavated areas through pipes, troughs, gutters, or other artificial means to a point of proper disposal.

D. Filter water removed from trenches and excavations through a sediment removal system, approved by the Engineer, prior to discharging from the Project site.

E. Remove mud, silt, debris, and other accumulations discharged to catch basins, sumps, ditches, or water courses. Leave catch basins, sumps, ditches, or water courses in a condition similar to that which existed prior to construction operations.

F. Employ control measures to minimize siltation and erosion in and adjacent to the area of the Work.

G. Locate dewatering pumps as far as possible from residential structures. House pumps in noise suppression enclosures if used during evening and night hours. Implement additional noise suppression measures to reduce operating noise levels to acceptable levels if the operation noise levels, as determined by the Engineer, are excessive. The acceptable level during the hours from 6 p.m. to 7:30 a.m. shall not exceed an average A-weighted sound pressure level of 60 dBA as measured at fifty (50) feet from the sound source or at the closest exterior wall of the nearest residence, whichever distance is less.

H. Maintain trenches and excavations free of water, snow, ice, and other liquids.

END OF SECTION

SECTION 31 23 23 - BACKFILLING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preparation and special requirements for backfilling.

B. Site backfilling.

C. Compaction requirements.

1.02 RELATED REQUIREMENTS

A. Section 31 22 00 - Grading

B. Section 31 23 16 - Excavation

C. Section 31 23 33 - Trenching

1.03 MEASUREMENT AND PAYMENT

A. Compensation for ADDITIONAL GRANULAR FILL AS ORDERED BY THE ENGINEER (A.O.B.E.) shall be at the unit price established in the Bid for that item. Such compensation shall include all necessary dewatering, sheeting and bracing, granular fill, compaction, and all other work necessary and related thereto. Measurement for payment for this item will be in place, by the Engineer, after compaction.

B. Compensation for ADDITIONAL 3/4" CRUSHED STONE AS ORDERED BY THE ENGINEER (A.O.B.E.) shall be at the unit price established in the Bid for that item. Such compensation shall include all necessary dewatering, sheeting and bracing, crushed stone, compaction, and all other work necessary and related thereto. Measurement for payment for this item will be in place, by the Engineer, after compaction.

C. No payment will be made for granular fill or crushed stone that is required by the Drawings or the Technical Specifications other than such Additional Granular Fill, or Additional 3/4" Crushed Stone as may be specifically ordered by the Engineer.

1.04 DEFINITIONS

A. Broken or Crushed Stone - A product resulting from the artificial crushing of rocks, boulders, or large cobblestones, substantially all faces of which have resulted from crushing operations. It shall consist of sound, tough, durable stone, reasonably free from soft, thin, elongated, laminated, friable, micaceous or disintegrated pieces, mud, dirt, or other deleterious material.

B. Bank or Crushed Gravel - A product consisting of sound, tough, durable particles of crushed or uncrushed gravel, free from soft, thin elongated or laminated pieces and vegetable or other deleterious material. Crushed gravel shall be the manufactured product resulting from the deliberate mechanical crushing of gravel with at least 50% of the gravel retained on the No. 4 sieve having at least one fractured face.

C. Reclaimed Miscellaneous Aggregate - A product consisting of sound, tough, durable particles of crushed reclaimed waste. It shall be free of soft disintegrated pieces, mud,

dirt, glass, or other injurious materials and contain no more than 2% by weight (mass) of asphalt cement.

1.05 REFERENCE STANDARDS

A. Standard Specification Sections:

1. Section M.01-Gradation of Aggregate, Article M.01.01.
2. Section M.02 Granular Fill Subbase Granular Base and Surfaces Stone Base Pervious Structure Backfill Free-Draining Material Crusher-Run Stone, Article M.02.06
3. Section M.12 Bearing Areas Riprap Slope Paving & Slope Protection Waterproofing and Dampproofing Stone and Granite Slope Curbing Calcium Chloride for Dust Control Wood, Article M.12.02.

B. ANSI/ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates

C. ANSI/ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3)

D. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

E. AASHTO T 90 - Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils

F. AASHTO T 96 - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

G. AASHTO T 104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

H. AASHTO T 146 - Standard Method of Test for Wet Preparation of Disturbed Soil Samples for Test

I. AASHTO T 180, Method D - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in) Drop

1.06 SUBMITTALS

A. Samples - Submit a fifty (50) pound sample of each type of fill material to the testing laboratory in air-tight containers.

B. Test Reports:

1. Submit sieve analysis test results for the select fill materials and imported common fill performed in accordance with ASTM C136. Test date shall be within 90 days of submittal date.
2. Submit abrasion and soundness test results as specified for the select fill materials and plasticity test results as applicable.
3. Submit field compaction test results performed by an independent testing laboratory.

1.07 QUALITY ASSURANCE

A. Tests and analyze fill materials in accordance with the Reference Standards.

B. Reclaimed miscellaneous aggregate material from off-site is not permitted for use.

PART 2 PRODUCTS

2.01 COMMON FILL MATERIALS

A. Subsoil - Re-used or imported mineral soils, free of constituents of concern, organic and frozen materials, roots, topsoil, loam, trash, snow, ice, wood, and other objectionable materials which may be compressible or which cannot be compacted or specified. Common fill shall not contain stones with a largest dimension greater than ten (10) inches, nor shall have greater than thirty (30) percent by weight passing the No. 200 sieve and shall have the physical properties such that it can be readily placed and compacted as specified during backfilling.

B. For common fill having greater than ten (10) percent passing the No. 200 sieve, the moisture content at the time of compaction shall not exceed three (3) percent above optimum, as determined by ASTM D1557.

C. The natural inorganic soils excavated from the site may conform to the specified requirements for common fill. However, remove over-sized stones and render the natural material suitable for optimum compaction by adding water or aerating as required, prior to placing and compacting.

D. Common fill shall have a maximum dry unit weight, determined by ASTM D1557, of not less than 100 pounds per cubic foot.

2.02 SELECT FILL MATERIALS

A. Granular Fill

1. Material shall consist of broken or crushed stone, bank or crushed gravel, reclaimed miscellaneous aggregate, or a mixture thereof.
2. Gradation shall conform to the following Gradation "A", except where Gradation "C" is noted on the drawings, Gradation "A" when tested from the supply source and after delivered to the Work site:

Square Mesh Sieves	Percent Passing by Weight	Percent Passing by Gradation "C"
3-1/2"	100	-
1-1/2"	55-100	100
3/4"	-	45-80
1/4"	25-60	25-60
#10	15-45	15-45
#40	5-25	5-25
#100	0-10	0-10
#200	0-5	0-5

Source: Standard Specifications, Form 218, July 2018, Article M.02.06 Grading "A" and "C".

3. Plasticity
   a. When the fraction of the dry sample passing the #100 mesh sieve is greater than four (4) percent and equal or less than (8) percent by weight, that fraction shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.

b. When the fraction of the dry sample passing the #100 mesh sieve is greater than eight (8) percent by weight, the sample will be washed; and the additional material passing the #100 mesh sieve shall be determined by AASHTO Method T 146, except that the #100 mesh sieve will be substituted for the #40 mesh sieve where the latter is specified in AASHTO Method T 146. The combined materials that passed the #100 mesh sieve shall not have sufficient plasticity to permit the performing of the plastic limit test using AASHTO Method T 90.

4. Abrasion - Material shall show less than fifty (50) percent loss on abrasion from the AASHTO T 96 Test.
5. Soundness - Material shall be tested for soundness as directed by the Engineer. The AASHTO T 104 Test shall show less than fifteen (15) percent loss at the end of five (5) cycles for coarse aggregates.

B. 3/4" Crushed Stone

1. Material shall be uniform in consistency and only contain clean, hard, tough, durable fragments.
2. Material shall comply with the following gradation when tested from the supply source and after delivered to the Work site:

Square Mesh Sieves	Percent Passing by Weight
1"	100
3/4"	90-100
1/2"	20-55
3/8"	0-15
#4	0-5
#200	1

Source: Standard Specifications, Form 2018, July 2020, Article M.01.02 No. 6

3. Abrasion - Material shall show less than forty (40) percent loss on abrasion from the AASHTO T 96 Test.
4. Soundness - Material shall be tested for soundness as directed by the Engineer. The AASHTO T 104 Test shall show less than ten (10) percent loss at the end of five (5) cycles for coarse aggregates.

2.03 MATERIALS

A. Geotextile - Comply with Section 31 23 33.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify stockpiled fill to be reused is approved.

B. Verify areas to be backfilled are free of debris, snow, ice, and water, and that the ground surfaces are not frozen.

3.02 PREPARATION

A. Compact subgrade surfaces to density requirements for backfill material.

B. Do not disturb bottom of excavation for footings and foundations.

C. Excavate by hand to final subgrade just before concrete reinforcement and formwork is placed. Trim bottoms to required lines and grades to leave solid base for other work.

D. Test subgrade with a ten (10) ton vibratory roller or loaded dump truck (72,000 lb. GVW min.). The subgrade will be considered soft if subgrade moves, weaves, or quakes during the test.

E. Unless otherwise indicated, cut out soft areas of subgrade that are not readily capable of in-situ compaction A.O.B.E. Backfill with additional granular fill, A.O.B.E. or additional crushed stone, A.O.B.E., as ordered by Engineer and compact to density equal to requirements for subsequent backfill material.

F. Obtain Engineer's approval of subgrade prior to backfilling.

G. Backfill unsuitable material excavations as ordered by the Engineer.

H. Backfill materials shall be placed on approved subgrade that is free of water and has been re-compacted.

I. Large stones (in excess of the greatest principal dimension defined for Common Fill Materials) may be used for backfill if approved by the Engineer. However, large stones shall not be placed in nests, but shall be distributed over the area.

J. Provide respective utility representatives an opportunity to inspect all uncovered facilities. Coordinate the repair of damaged utilities prior to backfilling.

3.03 BACKFILLING

A. Backfill areas to contours and elevations. Use unfrozen materials.

B. Load, haul and place common fill material from on-site or off-site as required to meet final grades.

C. Do not backfill against new concrete walls until the concrete has cured for the following periods:

1. 7 Days - When backfill can be placed on both sides of walls so that the maximum differential in height of backfill does not exceed two feet.
2. 14 Days - When backfill is placed on one side of wall only. Adequately brace wall as required.
3. Should the results of concrete cylinder compressive testing reveal that concrete compressive strength has been achieved sooner than the time periods indicated above, backfilling can then commence. Be responsible for additional compressive testing specimens and early testing.

D. Begin compaction of backfill at walls and work away from walls. Use hand guided power compaction equipment within five (5) feet of walls.

E. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.

F. Place and compact select fill materials in continuous layers not exceeding eight (8) inches (loose depth) in open areas, and eight (8) inches (loose depth) in areas where compacted by hand guided vibratory equipment, except as noted. Compact each individual layer uniformly to obtain the required minimum density of not less than 95% of the dry density achieved by the AASHTO T 180, Method D Test.

G. Place and compact common fill material in continuous layers not exceeding twelve (12) inches loose depth.

H. Employ a placement method so not to disturb or damage piping, foundation dampproofing, and utilities in trenches.

I. Maintain optimum moisture content of backfill materials to attain required compaction density.

J. Make changes in grade gradual. Blend slopes into level areas.

K. Dispose of surplus backfill materials as specified in Section 31 23 16.

L. Leave stockpile areas completely free of excess fill material.

M. Geotextile - Place geotextile in locations and to the dimensions shown on the Drawings or as directed by the Engineer. Install per the manufacturer's instructions for the specific purpose intended.

3.04 TOLERANCES

A. Top Surface of Backfilling - Plus or minus one (1) inch.

3.05 FIELD QUALITY CONTROL

A. The Owner shall retain and pay for services of an independent testing laboratory to perform compaction test on in-place materials. Contractor shall be responsible for arranging and coordinating with the Owner's testing laboratory to obtain tests.

B. Compaction tests on in-place materials, as required in the Schedule of Locations and Backfill Requirements below, shall be performed in accordance with ATSM D6938.

C. Should testing of a material fail to meet the specification requirements, resolve the problem as appropriate. Reimburse the Owner for all testing charges incurred by the Owner after the second failure, if repeated failures occur in the same material or the same lift.

3.06 SCHEDULE OF LOCATIONS AND BACKFILL REQUIREMENTS

A. The paragraphs below identify location, fill material to be used (identified from lower to upper fill type), compacted thickness of each fill, and compaction expressed as a percentage of maximum density and optimum moisture in comparison with ANSI/ASTM D1557.

1. Fill under pavement (including but not necessarily limited to bituminous, concrete, brick, stone or other masonry paved surfaces): Subsoil fill to subgrade, unless otherwise indicated, compacted to 95%.
2. Fill under structures: Granular fill to subgrade unless otherwise indicated or directed, compacted to 95%.
3. Fill under vegetated areas: Subsoil fill to subgrade, compacted to 95%.

B. Where specifically indicated on the Drawings or as ordered by the Engineer, firmly compact crushed stone with multiple passes of a vibratory roller or vibratory plate compactor.

C. Backfill in Trenches - Comply with Section 31 23 33.

END OF SECTION

SECTION 31 23 33 - TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavation, backfill, and compaction requirements for underground utility installation.

B. Pipe bedding material.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-In-Place Concrete

B. Section 31 23 16 - Excavation

C. Section 31 23 19 - Dewatering

D. Section 31 23 23 - Backfilling

E. Section 31 25 00 - Soil Erosion and Sediment Control

F. Section 33 41 00 - Storm Drainage Pipe

1.03 MEASUREMENT AND PAYMENT

A. Compensation for rock excavation, boulder removal, and disposal of these materials shall be as specified in Section 31 23 17.

B. Comply with Section 31 23 23 for additional select fill materials as ordered by the Engineer as applicable.

C. Compensation for excavating and disposing of earth materials as ordered by the Engineer beyond trench excavation limits shown on the Drawings or specified shall be at the unit price established in the Bid for ADDITIONAL TRENCH EXCAVATION - AS ORDERED BY THE ENGINEER (A.O.B.E.). Compensation includes excavation, dewatering, hauling and disposing of surplus materials off-site, removing pavements, sheeting and bracing, and other work necessary and related thereto. Measurement for payment for this item will be the actual volume removed as measured in-place by the Engineer.

D. No payment will be made for the excavation of materials to subgrade elevations or for geotextile that is required by the Drawings or the Specifications other than such Additional Trench Excavation - Unsuitable Materials or Additional Geotextile as may be specifically ordered by the Engineer.

1.04 DEFINITIONS

A. See Section 31 23 23.

1.05 REFERENCE STANDARDS

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

B. ANSI/ASTM D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3)

C. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

D. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity

E. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles

F. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

G. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile

H. ASTM D6241 - Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

I. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

J. AASHTO T 90 - Standard Method of Test for Determining the Plastic Limit and Plasticity Index of Soils

K. AASHTO T 96 - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

L. AASHTO T 104 - Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

M. AASHTO T 146 - Standard Method of Test for Wet Preparation of Disturbed Soil Samples for Test

N. AASHTO T 180, Method D - Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

1.06 SUBMITTALS

A. Samples - Submit a fifty (50) pound sample of each type of bedding and fill material to the testing laboratory in air-tight containers.

B. Test Reports:

1. Submit sieve analysis test results for the select fill materials and imported common fill performed in accordance with ASTM C136. Test date shall be within 90 days of submittal date.
2. Submit abrasion and soundness test results as specified for the select fill materials and plasticity test results as applicable.
3. Submit field compaction test results performed by an independent testing laboratory.

1.07 QUALITY ASSURANCE

A. Tests and analyze fill materials in accordance with the Reference Standards.

B. Reclaimed miscellaneous aggregate material from off-site is not permitted for use.

PART 2 PRODUCTS

2.01 COMMON FILL MATERIALS

A. Subsoil - Comply with Section 31 23 23.

2.02 SELECT BEDDING AND FILL MATERIALS

A. Granular Fill - Comply with Section 31 23 23

B. Crushed Stone - Comply with Section 31 23 23.

2.03 GEOTEXTILE

A. Nonwoven geotextile - Polypropylene, stable fiber, needle punched geotextile, GEOTEX® 601 as manufactured by Geotextile Systems by Propex.

Property	Test Method	Minimum Average Roll Value
Grab Tensile Strength	ASTM D4632	160 lbs
Elongation	ASTM D4632	50%
CBR Puncture Strength	ASTM D6241	410 lbs
Trapezoidal Tear	ASTM D4533	60 lbs
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	70 US Sieve (max.)
Permittivity	ASTM D4491	1.3 sec^{-1}
Flow Rate	ASTM D4491	110 $gal/ft^2/min$

B. Woven geotextile - Polypropylene, high tenacity yarn, woven geotextile, Mirafi® 600X as manufactured by TenCate Mirafi.

Property	Test Method	Minimum Average Roll Value
Grab Tensile Strength	ASTM D4632	315 lbs
Elongation	ASTM D4632	15%
CBR Puncture Strength	ASTM D6241	900 lbs
Trapezoidal Tear	ASTM D4533	120 lbs
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	40 US Sieve (max.)
Permittivity	ASTM D4491	0.05 sec^{-1}
Flow Rate	ASTM D4491	4.0 $gal/ft^2/min$

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify stockpiled fill to be reused is approved.

B. Verify areas to be backfilled are free of debris, snow, ice, or water, and that the ground surfaces are not frozen.

3.02 PREPARATION

A. Identify required lines, level, contours, and datum.

B. Sawcut pavements to be removed as delineated on the Drawings or as directed by the Engineer. Sawcut paved surfaces in neat and straight joint lines with a device approved by the Engineer. Pavements to be removed may be sawcut in advance but shall not be removed until the Work is ready to be installed.

C. Rough grade to subgrade prior to excavating for piping or structures.

D. Compact subgrade surfaces to density requirements for backfill material.

E. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases. Repair damage caused by construction operations at no additional cost to Owner or owner of damaged structure, utility or pipe chase, as approved by owner of damaged structure, utility or pipe chase.

F. Provide respective utility representatives an opportunity to inspect all uncovered facilities. Coordinate the repair of damaged utilities prior to backfilling.

3.03 EXCAVATION

A. Cut trenches to limits shown on Drawings. Where pipe is to be laid below the ground line, excavate a trench to the required depth and grade the bottom to the elevation of the bottom of the bedding material. Where pipe is to be laid in a fill area, place the embankment and compact to an elevation twelve (12) inches above the top of the proposed pipe, then excavate the trench and install the pipe.

B. Hand trim excavation and leave free of loose matter.

C. Excavate to minimum of one (1) horizontal to one (1) vertical line at existing foundations on rock, or a minimum of two (2) horizontal to one (1) vertical line at existing foundations on soil or decomposed rock, unless otherwise approved by Engineer.

D. Notify Engineer of unexpected subsurface conditions and discontinue work in affected area until notified to resume work.

E. Grade excavation top perimeter to prevent surface water run-off into excavation.

F. Correct unauthorized excavation at no cost to Owner.

G. Fill unauthorized over-excavated areas with granular fill or crushed stone as ordered by the Engineer, at no cost to Owner.

H. Remove unsuitable soil as ordered by the Engineer, and backfill as ordered by the Engineer.

3.04 BACKFILLING

A. Backfill trenches to contours and elevations. Use unfrozen materials. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

B. Place and compact select fill materials in continuous layers not exceeding eight (8) inches (loose depth) in open areas, and eight (8) inches (loose depth) in areas where compacted by hand guided vibratory equipment, except as noted. Compact each individual layer uniformly

to obtain the required minimum density of not less than 95% of the dry density achieved by the AASHTO T 180, Method D Test.

C. Place and compact common fill material in continuous layers not exceeding twelve (12) inches (loose depth).

D. Employ a placement method so not to disturb or damage foundation dampproofing or utility lines.

E. Maintain optimum moisture content of backfill materials to attain required compaction density.

F. Dispose of surplus backfill materials and unsuitable materials as specified in Section 31 23 16.

G. Leave stockpile areas completely free of excess fill materials.

3.05 GEOTEXTILE

A. Place geotextile and carefully backfill to avoid puncturing or tearing. Provide twelve (12) inch minimum overlap to cover aggregate and between adjoining geotextile sheets.

3.06 TOLERANCES

A. Top Surface of Backfilling - Plus or minus one (1) inch.

3.07 FIELD QUALITY CONTROL

A. The Owner shall retain and pay for services of an independent testing laboratory to perform compaction test on in-place materials. Contract or shall be responsible for arranging and coordinating with the Owner's testing laboratory to obtain tests.

B. Compaction tests on in-place materials, as required in the Schedule of Locations and Backfill Requirements list below, shall be performed in accordance with ATSM D6938.

C. Should testing of a material fail to meet the specification requirements, resolve the problem as appropriate. Reimburse the Owner for all testing charges incurred by the Owner after the second failure, if repeated failures occur in the same material or the same lift.

3.08 SCHEDULE OF LOCATIONS AND BACKFILL REQUIREMENTS

A. Perform in-place compaction tests on fill materials in accordance ASTM D6938. The paragraphs below identify location, fill material to be used (identified from lower to upper fill type), compacted thickness of each fill, and compaction expressed as a percentage of maximum density and optimum moisture in comparison with ANSI/ASTM D1557.

1. Fill under pavement (including but not necessarily limited to bituminous, concrete, brick, stone or other masonry paved surfaces) or structures, from the top of bedding material or bottom of pipe or culvert: Granular fill to subgrade unless otherwise indicated or directed, compacted to 95%.
2. Fill under vegetated areas, from the top of bedding material: Subsoil fill to subgrade, compacted to 95%, except as noted in Section 33 40 00.

B. Where specifically indicated on the Drawings or as ordered by the Engineer, firmly compact crushed stone with a minimum of two passes with a vibratory plate compactor.

3.09 PROTECTION

A. Protect excavations by shoring, bracing, sheet piling, under-pinning, or other methods required to prevent cave-in or loose soil from falling into excavation and as required by all applicable local, state and Federal safety regulations and codes.

B. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

C. Use proper caution when excavating in and around utility service facilities. Machine excavation shall not come within eighteen (18) inches from the designated location of a utility line except for pavement materials when in a roadway. After locating and verifying the location of the utility line utilizing hand tools, the Contractor may proceed with the careful use of power equipment.

D. Notify utility owner if accidental contact to a known utility or an unknown underground facility is discovered. Protect utility and facilities as directed by utility owner.

END OF SECTION

SECTION 31 25 00 - SOIL EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Geotextile silt fence.

B. Temporary mulching.

C. Temporary erosion control blankets.

D. Permanent turf reinforcement mats.

E. Filter bag for dewatering pump discharge.

F. Other methods and measures required to control soil erosion and sedimentation on a continuous basis throughout the course of the Work.

1.02 RELATED REQUIREMENTS

A. Section 01 57 00 - Temporary Controls

B. Section 31 10 00 - Site Preparation

C. Section 31 22 00 - Grading

D. Section 31 23 16 - Excavation

E. Section 31 23 19 - Dewatering

F. Section 31 23 23 - Backfilling

G. Section 31 23 33 - Trenching

H. Section 32 92 00 - Turf Establishment

1.03 SUBMITTALS

A. Certifications that materials proposed for use meet the requirements of this specification, unless otherwise approved by the Engineer.

1.04 QUALITY ASSURANCE

A. Parts 2 and 3 of this specification and the Contract Drawings set forth the minimum requirements for soil erosion and sediment control and do not include all methods and measures that may be required to control soil erosion and to prevent sediment from entering wetlands, water bodies and watercourses. It is the Contractor's responsibility to employ such additional methods and measures as may be necessary to fully comply with the guidelines and recommendations set forth in the "Connecticut Guidelines for Soil Erosion and Sediment Control", the Connecticut Council on Soil and Water Conservation, 2002, latest edition.

B. Maintain a copy of the "Connecticut Guidelines for Soil Erosion and Sediment Control" on the Project site for continuous reference thereto.

1.05 REFERENCE STANDARDS

A. ASTM D3776 - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric

B. ASTM D3786 - Standard Test Method for Bursting Strength of Textile Fabrics—Diaphragm Bursting Strength Tester Method

C. ASTM D4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

D. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity

E. ASTM D4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles

F. ASTM D4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

G. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile

H. ASTM D4833 - Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

I. ASTM D4884 - Standard Test Method for Strength of Sewn or Bonded Seams of Geotextiles

J. ASTM D5141 - Standard Test Method for Determining Filtering Efficiency and Flow Rate of the Filtration Component of a Sediment Retention Device

PART 2 PRODUCTS

2.01 MATERIALS

A. Geotextile Silt Fence - Pervious sheet of polypropylene, nylon, polyester, ethylene, or similar filaments. The geotextile shall be non-rotting, acid and alkali resistant, and have sufficient strength and permeability for the purpose intended. Filaments in the geotextile shall be resistant to absorption. The filament network must be dimensionally stable and resistant to delamination. The geotextile shall be free of any chemical treatment or coating which will reduce the permeability. The geotextile shall be free of any flaws or defects which will alter its physical properties. Torn or punctured geotextiles shall not be used. The geotextile shall be certified by the manufacturer, or supplier, as conforming to the following requirements:

Property	Test Method	Minimum Average Roll Value
Filtering Efficiency	ASTM D5141	75% (min)
Grab Tensile Strength	ASTM D4632	100 lbs
Puncture Strength	ASTM D4833	50 lbs
Mullen Burst	ASTM D3786	250 psi
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	0.60 - 0.90 mm (max.)
Permittivity	ASTM D4491	0.05 sec^{-1}
Flow Rate	ASTM D4491	0.2 $gal/ft^2/min$

B. Temporary Mulching - Hay, salt hay, straw, manufactured cellulose fiber or wood pulp mulch as set forth in the "Connecticut Guidelines for Soil Erosion and Sediment Control" as approved by Engineer.

C. Temporary Erosion Control Blankets - North American Green EroNet S150.

D. Permanent Turf Reinforcement Mats - North American Green VMax SC250.

E. Filter Bag for Dewatering Pump Discharge

1. Dirtbag® as manufactured by ACF Environmental. The filter bag shall be manufactured using a polypropylene nonwoven geotextile sewn into a bag with a double needle matching using a high strength thread.
2. The filter bag shall have a spout large enough to accommodate a four (4) inch discharge hose.
3. The discharge hose shall be secured with straps which shall secure the hose and prevent pumped water from escaping without being filtered. The filter bag seams shall conform to the following ASTM test methods:

Property	Test Method	Minimum Average Roll Value
Seam Wide Width Strength	ASTM D4884	100 lbs/in
Weight	ASTM D3776	8 oz/yd2
Grab Tensile Strength	ASTM D4632	205 lbs
Grab Tensile Elongation	ASTM D4632	15%
Puncture Strength	ASTM D4833	110 lbs
Mullen Burst	ASTM D3786	350 psi
Trapezoidal Tear	ASTM D4533	125 x 115 lbs
UV Resistance @ 500 hrs	ASTM D4355	70%
Apparent Opening Size	ASTM D4751	US 80 Sieve
Permittivity	ASTM D4491	1.5 sec^{-1}
Flow Rate	ASTM D4491	100 $gpm/ft^2/min$

F. Crushed Stone - Comply with Section 31 23 23 for the stone size shown on the Drawings.

G. Woven and Non-Woven Geotextile - Comply with Section 31 23 33.

PART 3 EXECUTION

3.01 INSTALLATION

A. Comply with Stormwater Pollution Control Notes and Details on the Drawings.

B. Dispose of all retained sediment or off-site in a legal manner or in a stable upland area as approved by the Engineer.

C. Install, maintain, replace, relocate, and remove specified materials in accordance with the manufacturer's written instructions and details or as shown on Drawings.

END OF SECTION

SECTION 32 05 00 - RESTORATION OF SURFACES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for completion and proper restoration of all surfaces damaged or disturbed under this Contract.

1.02 RELATED REQUIREMENTS

A. Section 31 25 00 - Soil Erosion and Sediment Control

B. Section 32 11 00 - Base Courses

C. Section 32 12 00 - Flexible Paving

D. Section 32 92 00 - Turf Establishment

1.03 QUALITY ASSURANCE

A. Restore grades and surfaces to be equal or better than the conditions prior to being damaged or disturbed, except as otherwise specified or shown on the Drawings.

B. Restore surfaces under the jurisdiction of public authorities or public utilities in accordance with the requirements of such authorities. Ascertain such requirements to procure necessary permits and inspections and pay required fees, deposits, and other charges.

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.01 GENERAL

A. Reinstall, replace, and construct items removed, damaged, destroyed, or displaced.

B. Replace items to their original locations or as designated on the Drawings.

C. Replace items removed during construction operations as soon as possible with special attention directed at those which control traffic, protect property and lives, are essential to a person's livelihood, create hazards when not in place, or are otherwise deemed essential.

D. Restore surfaces as soon as possible to cause the least amount of inconvenience to the public, to protect lives, to ensure safety, to avoid property damage, to provide for orderly and safe traffic conditions, and to provide an aesthetically pleasing construction site.

E. Replace pavements as specified in Sections 32 11 00 and 32 12 00.

F. Rough grade areas to be seeded or planted within 48 hours after installation of the Work. Finish grade within two (2) weeks after installation of the Work, topsoil within three (3) weeks after installation of the Work, and seed as soon as conditions are satisfactory. Outside of

seeding seasons, provide a temporary heavy mulch cover until seeding can be accomplished. Replant trees, shrubs and other vegetation as soon as possible.

G. Replace traffic signs as soon as possible but no later than 24 hours after installation of the Work.

H. Replace guide rails as soon as possible, but no later than 72 hours after installation of the Work.

I. The phrase "after installation of the Work" used above means after the installation of that portion of the Work which necessitated the removal of an item or items.

END OF SECTION

SECTION 32 92 00 - TURF ESTABLISHMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnishing and placing topsoil.

B. Establishment of grass turf on all disturbed surfaces not shown to be covered with other materials or structures.

1.02 RELATED REQUIREMENTS

A. Section 31 25 00 - Soil Erosion and Sediment Control

1.03 SUBMITTALS

A. Product Data - Submit technical data for fertilizer, lime, seed mixtures, and related products, including labels, chemical analysis, purity, recommended application rates, percentage of weed seed, and related data.

B. Samples - Submit sample of native and imported topsoil to the State Cooperative Extension System for analysis.

C. Test Reports - Soil test recommendations from State Cooperative Extension System.

1.04 GUARANTEE

A. Turf establishment guarantee period is one (1) year from the date of turf establishment completion contingent upon the lawns, grass, and ground cover remaining in vigorous and healthy condition.

B. Final acceptance of this portion of the Work will be given after lawns, grass, and ground cover have been in a vigorous and healthy condition for the entire turf establishment guarantee period.

PART 2 PRODUCTS

2.01 TOPSOIL

A. Topsoil - That portion of the soil profile defined technically as the "A" horizon by the Soil Science of America, containing not less than three (3) nor more than twenty (20) percent of organic matter as determined by loss-on-ignition of oven-dried samples.

B. The following textural classes, as determined on the basis of material passing the 850 µm mesh sieve and subjected to partial mechanical analysis, are acceptable:

1. Loamy sand, with not more than 80 percent sand.
2. Sandy Loam.
3. Loam.
4. Sandy Clay loam, with not more than 30 percent clay.
5. Silt loam, with not more than 60 percent silt.

C. Topsoil to be loose, friable, reasonably free of admixtures of subsoil, and free from refuse, stumps, roots, brush, weeds, rocks, and stones over one (1) inch in overall measurements. Topsoil to also be free from any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth.

2.02 LIME

A. Commercial grade ground limestone containing not less than fifty (50) percent of total oxides. Gradation as follows: Minimum seventy-five (75) percent passing the one-hundred (#100) mesh sieve and 100 percent passing the twenty (#20) mesh sieve.

2.03 FERTILIZER

A. Ten (10) percent nitrogen, six (6) percent phosphorous and four (4) percent potassium. Granulated to pass through one-eighth (1/8) inch screen.

2.04 SEED

A. Furnished to the site in unopened containers, fully labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act. Seed mixture to be approximately as follows:

	Mixture Percent	Minimum Percent Germination
Blue Grass	30%	85%
Creeping Red Fescue	40%	85%
Perennial Rye	20%	85%
Annual Rye	10%	85%

B. Use seed within one year of test date on label.

C. Percent Live Seed = Percent Minimum Purity x Percent Minimum Germination /100.

2.05 MULCH

A. Salt hay, straw, manufactured cellulose fiber or wood pulp mulch as approved.

PART 3 EXECUTION

3.01 GENERAL

A. Verify that all underground work in the area is completed, and all conditions are proper, prior to initiation of this portion of the Work.

B. Perform seeding only during the following dates:

1. April 1 to June 15.
2. August 15 to October 1.

C. With the exception of Crown Vetch, the final fall seeding dates may be extended an additional 15 days in the coastal towns of New London, Middlesex, New Haven, and Fairfield counties.

D. Follow recommendations of State Cooperative Extension Agency lab report for application rates of lime and fertilizer.

3.02 TOPSOILING

A. Spread topsoil evenly and compact lightly to a thickness of not less than six (6) inches. Do not spread topsoil in a frozen or muddy condition. Make allowance for settlement.

B. Import additional topsoil if insufficient quantity is available from stripping the Project site.

C. Surplus topsoil - Comply with Section 31 23 16.

3.03 SEEDING METHODS

A. Apply lime evenly, prior to fertilizing and seeding, and work lime into the top three (3) inches of soil. Redress the surface. Apply fertilizer after liming and before seeding. (Fertilizer may be sown with seed by hydroseeding if water soluble fertilizer is utilized.)

B. If topsoil in the areas to be seeded has become hard or crusted before seeding, make topsoil friable and receptive to seeding by approved methods which will not disrupt the line and grade of the areas to be seeded.

C. Apply seed uniformly by any agronomically acceptable and feasible method approved. Apply seed at a rate recommended by the seed vendor, but not less than four (4) pounds of live seed per 1,000 square feet, as determined by Article 2.04.C of this Specification.

D. Apply mulch as specified under Section 31 25 00.

E. When spreading straw mulch by hand, divide the area to be mulched into sections of approximately 1,000 square feet and place at least 70-90 pounds (1-1/2 to 2 bales) of straw in each section to ensure uniform distribution and obtain at least 80% coverage of the surface of the seedbed. Anchor mulches immediately after spreading to prevent wind-blowing by applying an approved binder or erosion control netting.

F. In areas where slopes to be vegetated are steeper than three (3) horizontal to one (1) vertical, install four (4) inches of straw mulch covered with approved erosion control netting, as soon as the seed is placed, unless otherwise shown on the Drawings or specified herein. Install netting in accordance with the manufacturer's instructions immediately after the mulch has been placed.

3.04 OUT-OF-SEASON SEEDINGS

A. Perform out-of-season seeding in the same manner as in-season seeding. Since acceptable turf establishment is less likely, be responsible for in-season reseeding until the turf conforms to Paragraph 1.04.C.

3.05 MAINTENANCE DURING TURF ESTABLISHMENT GUARANTEE PERIOD

A. Mow turfed area to an average height of two and one-half (2-1/2) inches whenever average height of grass becomes three and one-half (3-1/2) inches.

B. Mow, eradicate weeds, water, fertilize, overseed, and perform other operations necessary to promote turf growth.

C. Repair lawns, grass, and ground cover areas not found acceptable by the Engineer during the turf establishment guarantee period, and reset the turf establishment date of completion as specified in 1.04.A of this Section.

END OF SECTION

SECTION 33 40 10 - STORM DRAINAGE STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Catch basins.

1.02 RELATED REQUIREMENTS

A. Section 01 55 26 - Maintenance and Protection of Traffic

B. Section 01 57 00 - Temporary Controls

C. Section 03 30 00 - Cast-in-Place Concrete

D. Section 31 23 23 - Backfilling

E. Section 31 23 33 - Trenching

F. Section 33 41 00 - Storm Drainage Pipe

1.03 REFERENCE STANDARDS

A. See Sections 6.01, M.03, 6.02, and M.06.01 of the Standard Specifications, as attached to Section 03 30 00.

B. AWS Structural Welding Code.

C. ASTM A27 - Standard Specification for Steel Castings, Carbon, for General Application.

D. ASTM A36 - Standard Specification for Carbon Structural Steel.

E. ASTM A47 - Standard Specification for Ferritic Malleable Iron Castings.

F. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

G. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

H. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.

I. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.

J. ASTM C55 - Standard Specification for Concrete Building Brick.

K. ASTM C139 - Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.

L. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.

M. ASTM C990 - Standard Specifications for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

N. ASTM D4101 - Standard Specification for Polypropylene Injection and Extrusion Materials.

O. AASHTO M 105 - Standard Specification for Gray Iron Castings.

P. AASHTO M 199 - Standard Specification for Precast Reinforced Concrete Manhole Sections.

Q. AASHTO T 22 - Standard Method of Test for Compressive Strength of Cylindrical Concrete Specimens.

R. AASHTO T 23 - Standard Method of Test for Making and Curing Concrete Test Specimens in the Field.

S. AASHTO T 152 - Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method.

1.04 SUBMITTALS

A. Shop Drawings - Submit Shop Drawings for approval showing products and materials proposed for:

1. Precast concrete catch basins.
2. Catch basin frames and grates.

1.05 QUALITY ASSURANCE

A. Comply with the requirements of the authority having jurisdiction for work involving restoration of their storm drainage systems.

B. Furnish and install all drainage structures in accordance with the details shown on the Drawings.

C. All precast concrete drainage structure components shall be the product of a single manufacturer. Likewise, all frames and grates shall be the product of a single manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle all materials so as to preclude all damage thereto.

B. Deliver cement, lime, and all waterproofing and similar materials in manufacturer's unopened and clearly marked containers. Store in weather-proof enclosures.

1.07 SOURCE QUALITY CONTROL

A. For precast concrete, perform tests to ensure compliance with ASTM C478 and these Specifications.

PART 2 PRODUCTS

2.01 MATERIALS

A. Drainage Structures - The materials to be used in the construction shall conform to the following:

1. Brick for Drainage Structures - Conform to the requirements of ASTM C32 except that the depth shall be 2 1/4 inches, the width 3 5/8 inches and the length 8 inches, and except that the maximum water-absorption by 5-hour boiling shall not exceed the following limits:
   a. Average of 5 bricks: 15%.

b. Individual brick: 18%.

2. Concrete Building Brick for Drainage Structures - Conform to the requirements of ASTM C55, Grade S II.
3. Masonry Concrete Units for Drainage Structures - Conform to the requirements of ASTM C139.
4. Precast Units for Drainage Structures
   a. Precast units for drainage structures may be used except where particular conditions require building or casting in place.
   b. Fabrication plants shall have a quality control plan approved by the Chief, Materials Section of the Connecticut Department of Transportation that is demonstrated to the satisfaction of the Engineer. The facility, the quality of materials, the process of fabrication and the finished precast units shall be subject to inspection by the Engineer.
   c. Circular precast drainage structures shall conform to ASTM C478 and rectangular precast catch basins and drop inlets shall conform to ASTM C913 as supplemented below:
   d. All materials used for concrete shall conform to the requirements of Section M.03 of the Standard Specifications, as attached to Section 03 30 00.
   e. The pertinent provisions of Article 6.01.03 of the Standard Specifications, as attached to Section 03 30 00, shall apply except that the concrete shall contain 5.0% - 8.0% entrained air. Water-absorption of individual cores taken from precast units shall be not more than 7%.
   f. Reinforcement shall conform to the requirements of Article M.06.01 of the Standard Specifications, as attached to Section 03 30 00.
   g. Suitable provision shall be made in casting the units for convenient handling of the completed casting, and additional reinforcement steel shall be provided to allow for such handling in the casting yard and during transportation and placement. Each completed unit shall be identified with the name of manufacturer and date of the concrete pour from which it was cast, either by casting this information into an exposed face of the unit or by suitable stencil. For each day's production of precast units, the fabricator shall mold, cure and test standard cylinders, or cylinders compacted in a similar manner to the parent precast units, for the purpose of determining the compressive strength of the concrete incorporated into the precast units. Concrete used in molding the cylinders shall be representative of the concrete incorporated into the precast units during the production period. Cylinders shall be molded in accordance with AASHTO T 23, cured by the same method as the units they represent, and tested as prescribed in AASHTO T 22.
   h. The fabricator shall determine the air content of the concrete used in the day's production of precast units by performing tests as prescribed in AASHTO T 152.
   i. The equipment and personnel necessary to perform the required testing shall be furnished by the fabricator and approved by the Engineer. All testing equipment shall be calibrated at least once each twelve (12) months or as directed by the Engineer. The fabricator shall maintain records relative to the production, testing, and shipment of precast units supplied. Said records shall be available upon request.
   j. Certification - Precast concrete units will be accepted on the basis of fabricator’s certification. The fabricator shall certify each shipment of precast concrete units on Department Form MAT 314 (PC-1), "Certification of Precast Concrete Products." Two (2) copies of this certification shall be furnished with the shipment to the Engineer at the Project Site.
   k. Precast units that are cracked, show evidence of honeycomb, or have over ten (10) percent of their surface area patched may be subject to rejection, even though meeting other requirements.

5. Metal for Drainage Structures - Metal for catch basins, extensions, and gratings shall be cast iron, cast steel, structural steel, or malleable iron conforming to the requirements of the Drawings.
    a. Gratings shall bear uniformly on their supports. Extensions shall be designed so that the existing catch basin grate, when set in place, will have substantially the same bearing, fit and load carrying capacity as in the existing frame. The extension shall be designed to fit into the original frame, resting specifically on the flange and rim area. The extension shall accept the existing cover or grate so that the cover or grate is seated firmly without movement.
    b. Ladder rungs for manholes shall conform to ASTM C478 and shall be copolymer polypropylene conforming to ASTM D4101 for Type II propylene copolymers. The copolymer polypropylene shall encase a 1/2 inch diameter grade 60 reinforcing bar conforming to ASTM A615.
    c. Cast iron shall conform to the requirements of AASHTO M 105, Class 25 for the frames and Class 30 for grates.
    d. Cast steel shall conform to the requirements of ASTM A27, Grade optional, and shall be thoroughly annealed.
    e. Structural Steel shall conform to the requirements of ASTM A36 or ASTM A283, Grade B or better, as to quality and details of fabrication, except that in the chemical composition of the steel, the 2/10 of 1% of copper may be omitted.
    f. Malleable iron shall conform to the requirements of ASTM A47, Grade 22010. The materials and method of manufacture for drop inlets shall conform to the requirements as stated on the Drawings or as ordered.

B. Protective Compound Material - The brand and type of material must be listed on the Connecticut Department of Transportation's Qualified Products List and approved by the Engineer for the specified use.

C. Galvanizing - Unless otherwise specified on the Drawings, the zinc coating on all iron and steel materials, other than wire, shall meet the requirements of ASTM A123 or ASTM A153, whichever shall apply. When mechanical galvanizing is used it shall meet the requirements of ASTM B695 Class 50.

D. Joints - Neoprene rubber O-ring or self-sealant butyl based rubber gasket conforming to ASTM C443 and ASTM C990.

E. Mortar - Comply with Section 03 30 00.

F. Concrete - Comply with Section 03 30 00.

G. Granular Fill - Comply with Section 31 23 23.

H. Non-Woven Geotextile - Comply with Section 31 23 33.

I. Crushed Stone - Comply with Section 31 23 23.

PART 3 EXECUTION

3.01 PREPARATION

A. Install level, plumb and on select fill base materials. Comply with Section 31 23 23.

B. Verify that all pipes have been laid in the correct location, and that excavation and subgrade preparation is properly complete.

C. Pointing up - point up all concrete surfaces to provide a clean finished installation.

D. Install in conformance with Drawings and as specified herein.

3.02 INSTALLATION

A. These structures shall be constructed in accordance with the requirements contained herein for the character of work involved. The provisions of Article 6.02.03 of the Standard Specifications, as attached to Section 03 30 00, pertaining to bar reinforcement shall apply except that shop drawings need not be submitted for approval, unless called for on the Drawings or directed by the Engineer. Welding shall be performed in accordance with the applicable sections of the AWS Structural Welding Code, D1.1.

B. Give the surfaces of the tops of all catch basins, junction boxes, and drop inlets a coat of protective compound material immediately upon completion of the concrete curing period at the rate of 0.04 gallons per square yard.

C. Lay masonry units in full mortar beds.

D. Set metal fittings for catch basins, junction boxes, manholes, or drop inlets in full mortar beds or otherwise secured as shown on the Drawings.

E. Extend inlet and outlet pipes through the walls for a sufficient distance beyond the outside surface to allow for satisfactory connections. Construct the concrete or masonry around them and mortar inside and outside of joint neatly to prevent leakage along their outer surfaces. Cut the pipe flush with the inside face of the wall, or as shown on the Drawings.

F. Backfill the upper portion of the excavation made for catch basins and drop inlets down to the elevation of the invert of the outlet pipe but in no case to a depth greater than three (3) feet below the top of the structure with granular fill.

G. Remove frames, covers, and tops which are to be reset from their present beds; rebuild the walls or sides to conform to the requirements of the new construction; and reset the tops, frames, and covers. Alternatively, raise the grates or covers by extensions of suitable height approved by the Engineer.

H. Do not use extensions on catch basins or drop inlets at pavement low points or where adjacent curbing is being raised. Tack weld extensions for catch basins or drop inlets to the frame in four locations approximately at the mid points of each side of the frame. If the frames, covers, or tops are broken or so damaged as to be unfit for further use, with new, sound material conforming to the above requirements for the material involved.

END OF SECTION

SECTION 33 41 00 - STORM DRAINAGE PIPE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Storm drainage pipe, fittings, and appurtenances.

1.02 RELATED REQUIREMENTS

A. Section 01 55 26 - Maintenance and Protection of Traffic

B. Section 01 57 00 - Temporary Controls

C. Section 31 23 17 - Rock Excavation

D. Section 31 23 23 - Backfilling

E. Section 31 23 33 - Trenching

F. Section 33 40 10 - Storm Drainage Structures

1.03 REFERENCE STANDARDS

A. AASHTO M 170 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

B. AASHTO M 207 - Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe.

C. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Pipe.

D. AASHTO M 294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter.

E. AASHTO T 280 - Standard Method of Test for Concrete Pipe, Manhole Sections, or Tile.

F. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.

G. ASTM C1478 - Standard Specification for Storm Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes, and Laterals.

H. ASTM D140 - Standard Practice for Sampling Bituminous Materials.

1.04 SUBMITTALS

A. Shop Drawings - Submit catalog cuts, manufacturer's literature, and technical data for all pipe, end sections, and fittings.

1.05 QUALITY ASSURANCE

A. Comply with the requirements of the Town of Portland for work involving restoration of storm drainage systems in Town Roads. Comply with the requirements of the Connecticut

Department of Transportation for work involving restoration of storm drainage systems in State Highway right of way.

PART 2 PRODUCTS

2.01 CORRUGATED POLYETHYLENE PIPE AND FITTINGS

A. Pipe

1. 12-inch diameter to 60 inch diameter - AASHTO M 294 Type S (solid wall with smooth interior) or Type SP (solid wall with smooth interior and perforations) where indicated on the Drawings, as manufactured by Advanced Drainage Systems, Inc.

B. Tubing

1. 4-inch diameter to 10 inch diameter - AASHTO M 252 Type S (solid wall with smooth interior) or Type SP (solid wall with smooth interior and perforations) as indicated on the Drawings, as manufactured by Advanced Drainage Systems, Inc.

C. Fittings

1. End Sections and Couplings - Pro Link ST, soil tight unless otherwise shown on Drawings, high molecular weight, high density polyethylene conforming to AASHTO M 252 or 294, as manufactured by Advanced Drainage Systems, Inc.

2.02 DISSIMILAR MATERAIL PIPE COUPLER

A. Couplers to shall be products intended to connect two dissimilar pipe materials with identical inside diameters and different outside diameters. The use of an internal coupler spigot adapter with an outer coupler and wrap as manufactured by Marmac Consutruction Products Co., Inc. and Advanced Drainage System, Inc. is acceptable. Coupler products manufactured by Fernco Inc. that account for the difference in outside diameter of the connecting pipes are acceptable.

2.03 SELECT FILL AND BEDDING MATERIALS

A. Granular Fill as shown on Drawings and complying with Section 31 23 23.

B. Crushed Stone as shown on Drawings and complying with Section 31 23 23.

2.04 GEOTEXTILE

A. As shown on the Drawings and in accordance with Section 31 23 33.

PART 3 EXECUTION

3.01 INSTALLATION

A. Take precautions to protect existing storm drainage systems and their earth foundations and bedding. Replace in kind and size any storm drainage system components damaged or displaced during installation of the Work.

B. Inspect all pipe before laying. Reject and remove pipe not meeting Specifications.

C. Backfill in accordance with Section 31 23 23 to twelve (12) inches above the top of the proposed pipe elevation for pipes laid above existing grade prior to excavating trench.

D. Excavate trenches in accordance with Section 31 23 33.

E. Install pipes in accordance with the details and to the required lines and grades as shown on the Drawings using an approved method of control. Adjustments to line and grade shall be done by scraping away or filling under pipe, not by blocking or wedging.

F. Backfill trenches in accordance with Section 31 23 33. Compact fill material around pipe when fill material reaches six (6) inches in depth from pipe invert in addition to the requirements set forth in Section 31 23 33.

G. Normally, the placement of pipe shall start at the downstream end and progress upstream. All pipe shall be carefully laid, true to the lines and grades given, hub ends upgrade and with the spigot ends fully entered into the adjacent hubs.

H. Take up and relay or otherwise correct any pipe which is not in true alignment, or which shows any settlement or distortion after laying, to the satisfaction of the Engineer without additional compensation.

I. Where indicated on the Drawings or directed by the Engineer, take up and relay or extend and renew existing pipe culverts in the same manner as specified herein for new pipe culverts.

J. Where shown on the Drawings or directed by the Engineer, connect the proposed drainage system with existing drainage structures or pipes in a workmanlike manner.

K. Where shown on the Drawings or directed by the Engineer, plug existing pipes with cement masonry.

L. Install dissimilar pipe material couplers per manufacturer's written instructions.

END OF SECTION