

TOWN OF BRANFORD

BID PROPOSAL

FOR

**INSTALLATION OF
LOW PRESSURE SANITARY FORCE MAIN
RIVERVIEW AVENUE**

BRANFORD, CONNECTICUT

JAMES COSGROVE, FIRST SELECTMAN

PREPARED FOR: THE TOWN OF BRANFORD

PREPARED BY: CRISCUOLO ENGINEERING, LLC

CE FILE 2017.070

TABLE OF CONTENTS**DIVISION 0 – BIDDING AND CONTRACT REQUIREMENTS****PART A - BIDDING DOCUMENTS**

00020	Invitation to Bid
00100	Instructions to Bidders
00300	Bid Form
00410	Bid Bond; EJCDC C430 (2002 Edition)
00420	Bidder's Qualifications Form
00430	Non-Collusion Affidavit of Prime Bidder

PART B - CONTRACT DOCUMENTS

00500	Agreement
00610	Performance Bond; EJCDC C-610 (2002 Edition)
00615	Payment Bond; EJCDC C-615 (2002 Edition)
00700	General Conditions; EJCDC C-700 (2007 Edition)

PART C - SUPPLEMENTAL CONTRACT DOCUMENTS

1. Drawings (1 OF 3 thru 3 OF 3) Attached Separately
2. Addenda

DIVISION 1 – GENERAL REQUIREMENTS

01010	Summary of Work
01046	Control of Work
01295	Schedule of Values
01300	Submittals
01310	Construction Progress Schedule
01400	Quality Assurance
01500	Temporary Facilities
01600	Control of Materials
01610	Delivery, Storage and Handling
01710	Cleaning Up
01740	Warranties and Bonds

DIVISION 2 – SITE WORK

02018	Vibration Monitoring
02100	Site Preparation and Restoration
02110	Mobilization
02120	Maintenance & Protection of Traffic
02140	Dewatering
02210	Earth Excavation, Backfill, Fill and Grading
02211	Rock Excavation and Disposal

02224	Compacted Gravel
02225	Processed Aggregate Base
02435	Crushed Stone
02500	Bituminous Concrete Pavement
02568	Erosion and Sedimentation Controls
02610	Low Pressure Force Main
02900	Lawn & Grasses

Residential Grinder Pump Systems
(for reference only – not part of contract)

Part A
Bidding Documents

SECTION 00020

INVITATION TO BID**PROJECT: *LOW PRESSURE SANITARY FORCE MAIN
RIVERVIEW AVENUE
TOWN OF BRANFORD, CONNECTICUT***

- Sealed Bids will be received at the Finance Department, 1019 Main Street, P.O. Box 150, Branford, Connecticut 06405, for **PROJECT: *LOW PRESSURE SANITARY FORCE MAIN, RIVERVIEW AVENUE - TOWN OF BRANFORD, CONNECTICUT*** until 11:00 am, Thursday, August 22, 2019. Said Bids will then be opened and read aloud publicly at 11:00 am, Thursday, August 22, 2019.
- Bidding Documents and Contract Documents prepared by the project engineer, Criscuolo Engineering, LLC, may be obtained beginning Thursday, August 1, 2019 at the Town of Branford Engineering Department, 1019 Main Street, P.O. Box 150, Branford, Connecticut, Monday through Friday between 8:30 a.m. and 4:30 p.m. A \$25.00 non-refundable deposit is required. Documents will also be available on-line at www.branford-ct.gov
- A non-mandatory pre-bid meeting will be held at 11:00 am, Thursday, August 8, 2019 at the intersection of Riverview Avenue and Highland Avenue.
- All questions from Bidders must be received by the Engineer by fax (203.488.5729) or email in writing before 2:00 pm, Wednesday, August 14, 2019. (send emails to: office@cengineeringllc.com)
- All Bidders are required to examine and carefully study the Bidding Documents, and the Contract Documents so as to fully inform themselves as to the Work that is to be performed, the acceptable methods and means to be carried out in the performance of this Work, and the contractual obligations that would result from the submittal of a Bid proposal.
- Each Bid shall be prepared and submitted in accordance to the standards specified in the Bidding Documents/Contract Documents, and accompanied by Bid security in the form of a certified or bank check, made payable to the Town of Branford, for the amount equal to five percent (5%) of the total value of the Bid, or a Bid Bond designating the Town of Branford as obligee, in the amount of five percent (5%) of the total value of the Bid. If any Bid is not accompanied by a Bid Bond or check at the specified time of the Bid opening, the incomplete Bid will not be read and this action will constitute automatic rejection of such Bid.
- Complete instructions for Bid submission are included in the Instructions to Bidders.
- No obviously unbalanced Bid will be considered in the awarding of this contract.
- The contract must be executed within ten (10) days after the issuance by the OWNER of the Notice of Award. No bidder may withdraw his/her Bid within ninety (90) days after the actual date of the opening thereof.
- The apparent successful Bidder will be required to provide an identifying list of and experience statements for all subcontractors, suppliers, individuals, and entities proposed for the Work.

- The successful bidder will be required to furnish payment and performance bonds, each in an amount equal to 100% of the total Bid. A certified check cannot be substituted for either bond. The successful Bidder will also be required to submit the necessary certificates of insurance in accordance with the Contract Documents.
- The Bidder is hereby on notice that the Town of Branford reserves the right, at its sole discretion, to alter quantities for various items, and to accept or reject any or all Bids or any portion of any Bids, for any or no reason, including unavailability of appropriated funds, or as it may deem to be in its best interests. The award of this Contract is subject to, the approval of such governmental agencies as may be required by law, and the appropriation of adequate funds by the proper agencies, as applicable.
- The Town of Branford is an Affirmative Action/Equal Opportunity Employer. Minority/Womens' Business Enterprises are encouraged to apply.

Tyechia Pettway, Purchasing Clerk, Town of Branford

TOWN OF BRANFORD
OFFICE OF THE TREASUER



1019 Main Street
Post Office Box 150
Branford, CT 06405

(203) 488-8394
FAX: 315-3736

**General Requirements for Bidding
and
Instructions to Bidders**

NOTICE

Information provided in these specifications is ***CONFIDENTIAL*** and is to be used only for the purpose of preparing a proposal. It is further expected that each bidder will read these specifications with care, for failure to meet every one or a combination of specified conditions may invalidate the proposal.

The Town reserves the right to reject any or all bids or any portion thereof and to accept the bid deemed to be in the best interest of the Town of Branford.

Bidders are requested to submit quotations on the basis of these specifications. Alternate quotations will receive consideration providing such alternatives are clearly explained.

The information contained herein is believed to be accurate and is based upon the latest available information but is not to be considered in any way as a warranty.

Revised 5/2012
Standard Form

SECTION I - General Terms and Conditions

A. Compliance with Laws

The bidder shall at all times observe and comply with all laws, ordinances and regulations of the federal, state and local governments, which may in any way affect the preparation or the performance of the contract.

B. Timetable

Price quoted must be valid for **60** days. Delivery and installation completion dates must be included in the bid proposal.

C. Consideration of Proposals

The Board of Selectmen, or a majority of them, reserve the right to select or reject alternate proposals; to waive informality in proposals; and to reject any and all bids, or accept such bid as shall in its judgement be to the best interest of the Town of Branford.

D. Bid Bond

1. A certified check or bank draft made payable to the “Treasurer, Town of Branford”, or a satisfactory bid executed by the bidder and a surety company in an amount no less than five percent (5%) of the base bid, may be required with each proposal.
2. Checks or drafts will be returned to unsuccessful bidders within ten (10) business days of the bid award.

E. Performance Bond

Successful bidders will be required to furnish a Performance and Payment Bond in the amount of 100% of the contract sum.

F. Protection of Work and Property

Successful bidders shall be responsible for protection of their equipment and materials against theft, damage or deterioration on the site.

G. Competency of Bidders

1. Bidders shall have had proven experience in the field of work.
2. Bidders shall submit with their bid a listing of recent work performed within the State of Connecticut of the size equal to or greater than the work being bid.

H. Alternates

1. Any alternates to specified materials or workmanship must be separately listed and described in detail.
2. Alternates will be considered in awarding the contract only if they provide, as a minimum requirement, all features contained in the specifications.
3. The Town of Branford reserves the sole right to determine through its agents the equality of alternate products and/or installation procedures.

I. Bid Requirements

1. Each bidder shall return two (2) copies of the proposal sheet entitled "Bid Proposal". Each bid proposal must be signed by an authorized agent of the bidder.
2. Each bidder must complete and have notarized the "Non-Collusion Affidavit of Bidder" form. This form must accompany all bids being submitted.
3. Each bidder must be in good standing with the Town of Branford.
4. Successful bidders must obtain any required governmental approvals.

J. Specifications – General

The contract shall include all labor and materials, tools and equipment and services required for proper performance of the work as specified hereinafter and as may be required for proper completion of the work in accordance with the highest standards of the trades involved.

K. Examination of Site

Prior to submission of the bid, contractor shall visit the site, consult with the supervisor, and become thoroughly familiar with all conditions under which the work will be installed. The contractor will be responsible for any assumptions made regarding the site for the work to be performed.

SECTION II - Insurance Requirements

Bidder shall agree to maintain in force at all times during which services are to be performed the following coverages and shall name the Town of Branford as Additional Insured on a primary and non-contributory basis to the Bidder's Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the bidders Certificate of Insurance.** Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum Best's Rating of A-. In addition, all Carriers are subject to approval by the Town of Branford.

		(Minimum Limits)
General Liability	Each Occurrence	\$1,000,000
	General Aggregate	\$2,000,000
	Products/Completed Operations Aggregate	\$2,000,000
	-Include Waiver of Subrogation	
Auto Liability	Combined Single Limit	
	Each Accident	\$1,000,000
Umbrella (Excess Liability)	Each Occurrence	\$1,000,000
	Aggregate	\$1,000,000
Workers' Compensation and Employers' Liability	WC Statutory Limits	
	EL Each Accident	\$500,000
	EL Disease Each Employee	\$500,000
	EL Disease Policy Limit	\$500,000

Original, completed Certificates of Insurance must be presented to the Town of Branford prior to purchase order/contract issuance. Bidder agrees to provide replacement/renewal certificates at least 60 days prior to the expiration of the policy.

Hold Harmless Requirements

The contractor shall, at all times, indemnify and save harmless the Town of Branford, its officers, agents, and servants on account of any and all claims, damages, losses, litigation expense, counsel fees and compensation arising out of injuries (including death) sustained by or alleged to have been sustained by the public, any or all persons affected by the contractor's work, or by the contractor, any subcontractor, material, men or anyone directly or indirectly employed by them or any one of them while engaged in the performance of this contract. The Town of Branford shall be named as an additional insured on said policy of public liability insurance to cover all claims against the Town arising out of said contract.

BID BOND

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business)

OWNER (Name and Address):

TOWN OF BRANFORD
1019 MAIN STREET, P. O. BOX 150
BRANFORD, CONNECTICUT 06405

BID

BID DUE DATE:

PROJECT (Brief Description Including Location):

LOW PRESSURE SANITARY FORCE MAIN
RIVERVIEW AVENUE,
BRANFORD, CONNECTICUT

BOND

BOND NUMBER:

DATE (Not later than Bid due date):

PENAL SUM: _____ (Words) _____ (Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

_____(Seal)
Bidder's name and Corporate Seal

_____(Seal)
Surety's Name and Corporate Seal

By: _____
Signature and Title

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title

Attest: _____
Signature and Title

Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, OWNER, or any other party shall be considered plural where applicable.

PENAL SUM FORM

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Document, or
 - 3.2 All Bids are rejected by OWNER, or
 - 3.3 OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or actions shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirements of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

REFERENCES

The Bidder is required to fill out the following form to enable the Owner to make inquiries and judge as to the Bidder's' experience, skill, available financial resources, credit, and business standing.

1. Number of years the bidder has been in business as a General Contractor _____

2. List three projects of similar nature to the project described herein that the bidder has completed. Include name, address, and telephone number of a reference for each project., include approximate construction cost: _____

3. List projects under construction by the bidder, dollar amount of the contract and percent complete: _____

4. Has the bidder ever failed to complete work awarded; if so, state where and why: _____

5. Does the bidder plan to sublet any part of this work; if so, give details: _____

6. List equipment bidder owns that is available for this project: _____

7. List equipment Bidder plans to rent or purchase for this project: _____

8. If the bidder has worked under the direction of a Consulting Town Inspector, list recent projects, include the name, address, and telephone number of the consultant: _____

9. List name, address and telephone number for the following:

Surety: _____

Bank: _____

Major Material Supplier: _____

Bidder Signature _____

Name _____

Title _____

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____)
_____) ss.
County of _____

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

- 1) He is _____ (owner, partner, principal or officer) 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 Price 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 proceeds or prices in the attached Bid or any other 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 Branford (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.

The undersigned bidder further certifies that this statement is executed for the purpose of inducing the Town of Branford to consider the bid and make an award in accordance therewith.

Subscribed and sworn before me
This ____ day of _____, 2018

Legal Name of Bidder

Business Address

Notary Public
My Commission Expires

Signature and Title of Person

Date

Part B
Contract Documents

LOW PRESSURE SANITARY FORCE MAIN

**RIVERVIEW AVENUE,
BRANFORD, CONNECTICUT**

TOWN OF BRANFORD, CONNECTICUT

CONTRACT AND AGREEMENT

THIS AGREEMENT, made this _____ day of _____ in the year 201 _____,

Between the Town of Branford (hereinafter called OWNER), with its principal office and place of business at

Branford Town Hall, Branford, Connecticut 06405, acting herein through it's First Selectman and _____

_____ a _____, corporation, with an office and place of business at _____

_____, hereinafter called the CONTRACTOR.

WITNESSETH: That the parties to this agreement in consideration of the undertakings, promises, and agreements on the part of the other herein contained, hereby undertake, promise, and agree as follows:

I. SCOPE OF WORK

CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as providing all labor, services, tools, equipment, materials, incidentals, and documentation required to produce the construction and complete the Work. The overall scope of Work includes, but is not limited to the installation of 400± LF of 2" PVC force main including 13 lateral connectors stubbed to the right-of-way line. All excavations, bedding, backfill, pavement repair and landscaping as required for piping installation shall be included.

The Project has been designed by *Criscuolo Engineering, LLC (CE)*. All references to ENGINEER anywhere within the Contract Documents shall be interpreted to mean *Criscuolo Engineering, LLC*. Any questions or ambiguity regarding the Project shall be brought to the immediate attention of the ENGINEER or their authorized representative.

II. CONTRACT INCLUDES

The indices, headings, and subheadings are for convenience only and do not form a part of the Contract Documents.

The CONTRACTOR shall, at his own sole cost and expense, furnish all labor, materials, and other services necessary for the completion of this Contract and shall complete and finish the same in the most thorough, workmanlike, and substantial manner, in every respect, to the satisfaction and approval of the OWNER, in the manner and within the time hereinafter limited, and in strict accordance with the Advertisement, Information for Bidders, Proposal, Detailed Specifications, Project Manual and Addenda hereto attached, and the Contract Drawings herein referred to, (collectively the "contract documents"), which contract documents are hereby made a part of this Contract as fully as if the same were repeated at length herein.

Addendum No.____ Dated:_____ Addendum No.____ Dated:_____

III. SPECIFICATIONS AND CONTRACT DRAWINGS SUPPLEMENTARY

The said Specifications and Contract Drawings are intended to supplement each other, and together constitute one complete set of Specifications and Contract Drawings, so that any Work exhibited in the one and not in the other shall be executed just as if it had been set forth in both, in order that the Work shall be completed in every respect according to the complete design or designs as decided and determined by the ENGINEER. Should anything be omitted from the Specifications and Contract Drawings, the CONTRACTOR shall promptly notify the ENGINEER. From time to time during the progress of the Work, the ENGINEER will furnish such supplementary or working drawings as are necessary to show changes or define the Work in more detail, and these also shall be considered as Contract Drawings. When discrepancies exist between the Contract Drawings and Specifications, the Specifications shall govern.

IV. MODIFICATIONS

The CONTRACTOR, in entering into this Contract, understands that the OWNER reserves the right to modify, to the extent herein provided, the arrangement, character, grade, or size of the Work or appurtenances whenever, in the OWNER'S opinion, it shall be deemed necessary or advisable so to do. Minor changes in the Work, not involving extra cost and consistent with the purposes of the Work, may be made by verbal order, but no modifications involving extra Work or material changes shall be made unless ordered in writing by the ENGINEER; and if the modification requires additional cost, a purchase order must be issued prior to Work commencing. The CONTRACTOR shall and will accept such modifications when ordered in writing by the OWNER through the Town Inspector, and the same shall not vitiate or void this Contract.

Any such modifications so made shall not, however, subject the CONTRACTOR to increased expense without equitable compensation, which shall be determined by the ENGINEER. If such modifications result in a decrease in the cost of Work involved, and equitable deduction from the Contract price, to be determined by the ENGINEER, shall be made. The ENGINEER'S determination of such additional compensation, or of any such deduction, shall be based upon the unit prices in the CONTRACTOR'S bid, unless the modification involves Work not included in such bids and then in the event, the modification shall be as set forth in Section XXVIII prior to the commencement of additional Work. In no event shall any modification in the Work shown on the Plans and Specifications be made unless the nature and extent thereof has first been certified by the ENGINEER in writing and sent to the CONTRACTOR.

V. CORRECTION OF ERRORS AND OMISSIONS

The Plans and Specifications forming part of this Contract are intended to be explanatory of each other, but should any discrepancy appear or misunderstanding arise as to the import of anything contained in either, the explanation and decision of the ENGINEER shall be final and binding on the CONTRACTOR; and all directions and explanations required, to complete and make effective any of the provisions of the Contract and Specifications, shall be given by the ENGINEER. Corrections of errors and omissions in the Drawings or Specifications may be made by the ENGINEER when such corrections are necessary for the proper fulfillment of the Contract Documents as construed by the ENGINEER. The effect of such corrections shall date from the time that the ENGINEER gives due notice thereof to the CONTRACTOR.

VI. ENGINEER'S DECISION

All Work under this Contract shall be done to the satisfaction of the ENGINEER, who shall determine the amount, quality, acceptability, and fitness of the several items of Work and materials which are to be paid for hereunder. He also shall decide all questions that may arise as to the fulfillment of the terms of the Contract, Plans, and Specifications. The determination of the ENGINEER in all such matters shall be final and binding upon the parties thereto.

VII. INSPECTION OF WORK

It is agreed that the OWNER may, at its pleasure, appoint and employ, at its own expense, such persons as may be necessary, who are to act as Town Inspectors, or agents for the purpose of determining, in the municipalities interest, that the materials furnished and the Work done, as the Work progresses, conforms to the requirements of the Contract Documents. Such persons shall have unrestricted access to all parts of the Work and to other places at and where the preparation of the materials and other parts of the Work to be done under this Contract is conducted. The CONTRACTOR shall give them, all facilities and assistance required carrying out their Work of inspection.

It is not the function of the Town Inspector to supervise or direct the manner in which the Work to be done under this Contract is carried on or conducted. The Town Inspector is not responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the CONTRACTOR'S failure to carry out the Work in accordance with the Contract Documents.

The Town Inspector shall have authority to reject and shall reject any Work or material, or any part thereof, which does not, in his opinion, conform to the Contract Drawings, Working drawings, Specifications, and Contract, and it shall be permissible for him to do so at any time during the progress of the Work.

No Work shall be done except in the presence of the Town Inspector or his assistants. No material of any kind shall be used upon the Work until it has been inspected and accepted by the Town Inspector. Any materials or workmanship found at any time to be defective, or not of the quality or character required by the Contract Drawings and Specifications, shall be remedied at once regardless of previous inspection.

Such inspection shall not relieve the CONTRACTOR from any obligation to perform said Work strictly in accordance with the Contract Drawings and Specifications, and Work not so constructed shall be removed and made good by the CONTRACTOR at this own expense and free of all expense to the OWNER, whenever so ordered by the OWNER, without reference to any previous oversight or error in inspection.

VIII. ADDRESS OF CONTRACTOR

The address given in the Proposal, upon which this Contract is based, shall be the place where official notices will be sent. The delivery to the above-named place of any such notice, letter, or other communication from the Town to the CONTRACTOR, shall be the said date of such delivery. Nothing herein contained shall be deemed to preclude or render inoperative the service required by any notice, letter, or other communication upon the CONTRACTOR personally.

IX. OBLIGATION OF THE CONTRACTOR

The CONTRACTOR shall, at his own expense, provide any and all manner of supervisor, insurance, taxes, labor, materials, apparatus, scaffolding, appliances, tools, machinery, power, transportation, and whatever else may be required of every description necessary to do and complete the Work and shall be solely answerable for the same and for the safe, proper, and lawful construction, maintenance, and use thereof. The CONTRACTOR shall cover and protect the Work from damage and shall make good all injury to the same occurring before completion of this Contract. The CONTRACTOR shall employ only competent workmen and shall provide experienced superintendents and foremen on each part of the Work.

The CONTRACTOR shall, at its own expense, wherever necessary or required, maintain fences, provide watchmen, maintain lights, place additional timber and braces, and take such other precautions as may be necessary to protect life, property, and structures, vehicles and pedestrians and shall be liable for all damages, occasioned in any way by his act or neglect or that of his agent, employees, or workmen. He shall provide access at all times to private property.

X. OCCUPATIONAL SAFETY AND HEALTH ACT

The applicable sections of the Occupational Safety and Health Act of 1970 (Williams-Steiger Act) shall apply and be made a part of this Contract. The CONTRACTOR'S attention is particularly directed to the record keeping requirements of this Act. The State and Municipal laws, regulations and requirements as to OSHA shall be deemed incorporated herein.

XI. NONDISCRIMINATION IN EMPLOYMENT

The CONTRACTOR agrees and warrants that, in the performance of this Contract, he will not discriminate or permit discrimination against any person or group of persons on the grounds of their race, color, religious creed, age, marital or civil union status, national origin, ancestry, sex, mental retardation, physical disability or sexual orientation in any manner prohibited by State, Federal, County, or Municipal law. The State and Municipal laws, regulations and requirements as to nondiscrimination shall be deemed incorporated herein.

XII. PERSONAL ATTENTION AND COMPETENT WORKMEN

The CONTRACTOR shall give his personal attention constantly to the faithful prosecution of the Work and shall be present, either in person or by a duly authorized representative, on the site of the Work continually during its progress to receive directions or instructions from the Town Inspector. The CONTRACTOR shall employ at the site, during the performance of the Work, a competent superintendent, or foreman who shall be satisfactory to the Town Inspector and who shall not be changed, except with the consent of the Town Inspector, unless he shall cease to be an employee of the CONTRACTOR. Such superintendent or foreman shall represent and have full authority to act for the CONTRACTOR in his absence, and all directions and instructions given such superintendent or foreman shall be as binding as if given to the CONTRACTOR..

The CONTRACTOR shall employ only competent, skillful men to do the Work, and whenever the ENGINEER shall notify the CONTRACTOR in writing that any man on the Work is, in his opinion, incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such man shall be discharged from the Work and shall not again be employed on it, except with the consent of the ENGINEER.

XIII. PUBLIC SAFEGUARDS

The CONTRACTOR agrees to conduct the Work at all times in such a manner that public travel shall not be inconvenienced needlessly, neither shall it be wholly obstructed at any point.

XIV. MATERIALS AND WORKMANSHIP

It is the intent of the Specifications to describe fully and definitely the character of materials and workmanship furnished regarding all ordinary features and to require first-class Work and materials in all particulars. For any unexpected features arising during the progress of the Work and not fully covered herein, the Specifications shall be interpreted by the ENGINEER to require first class Work and materials in all respects and such interpretation shall be accepted by the CONTRACTOR.

XV. MATERIALS AND MANUFACTURED ARTICLES

All materials and workmanship shall be subject to the approval of the Town Inspector and shall be in conformity with approved modern practice.

Unless otherwise specifically provided for in the Specifications, all materials incorporated in the Work shall be new, of standard and first-class quality, and of the best workmanship and design. No inferior or low grade material will be either approved or accepted, and all Work of assembly and construction must be done in a neat, first-class, and workmanlike manner.

XVI. UNNOTICED DEFECTS

The inspection of the Work and materials by the Town Inspector shall not relieve the CONTRACTOR of any of his obligations to fulfill this Contract, as herein described, and defective Work shall be made good and unsuitable materials shall be rejected, notwithstanding that such Work and materials had been previously overlooked by the Town Inspector and accepted or estimated for payment. If the Work or any part thereof shall be found defective at any time before final acceptance of the whole Work, the CONTRACTOR shall forthwith make good such defects, in a manner satisfactory to the Town Inspector.

XVII. CARE AND PROTECTION OF WORK

From the commencement of the Work until the completion of the same, the CONTRACTOR shall be solely responsible for the care of the Work covered by the Contract and for the materials delivered at the site intended to be used in the Work; and all injury, damage, or loss of the same, from whatever cause, shall be made good at his expense before the final estimate is made. He shall provide suitable means of protection for all materials intended to be used in the Work and for all Work in progress as well as for completed Work. He shall take all necessary precautions to prevent injury or damage to the Work under construction by flood, freezing or inclement weather at any and all times. The methods used for this purpose shall be subject to the approval of the Town Inspector, but shall not relieve the CONTRACTOR from liability for inadequate protection of the Work or materials.

XVIII. ASSIGNMENT OF CONTRACT

The CONTRACTOR shall have no right or power to assign this contract, in whole or in part, nor to assign any right arising or moneys due or to grow due thereunder, without prior written approval of the OWNER.

XIX. SUBCONTRACTING

The CONTRACTOR may utilize the services of specialty subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty subcontractors. The CONTRACTOR shall not award the Work to a subcontractor(s) without prior written approval of the OWNER. The CONTRACTOR shall be fully responsible to the OWNER for all the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them.

The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to the CONTRACTOR by the terms of these Contract Documents, insofar as applicable to the Work of subcontractors, and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provisions of these Contract Documents.

Nothing contained in this contract shall create any contractual relation between any subcontractor and the OWNER.

XX. LIABILITY OF CONTRACTOR FOR EMPLOYEES

Each and every employee of the CONTRACTOR and each and every of his subcontractors engaged in the said Work shall, for all purposes, be deemed and taken to be the exclusive servants of the CONTRACTOR and not for any purpose or in any manner in the employment of the OWNER. The CONTRACTOR shall not be relieved from responsibility or liability or account of any fault or delay in the execution of the said Work, or any part thereof, by any such employee, or any such subcontractor, or any materialman, whatsoever.

XXI. COORDINATION WITH OTHER CONTRACTORS AND UTILITIES

During the progress of the Work, existing utilities may be found to be in close proximity to or in conflict with the Work being installed. The CONTRACTOR shall make every effort to identify and locate these utilities before Working in the area. If it is known or found that these utilities exist, the CONTRACTOR shall contact the appropriate utility and alert them to the situation. Should an existing utility be found to be in close proximity to the Work the CONTRACTOR shall take all the necessary precautions to protect the utilities and his Work. Should existing utilities be found to conflict with the Work, the CONTRACTOR shall arrange with the utility company for their adjustment. No additional compensation will be made for delays, inconvenience, or damage sustained by the CONTRACTOR due to interference from the above-noted utility appurtenances or the operation of locating, installing, or moving them or the inability of others to perform their Work in a timely manner.

XXII. PERMITS, LAWS, CODES, ORDINANCES AND INSURANCE

The CONTRACTOR shall keep himself fully informed of all existing and current codes, ordinances, and regulations and Municipal, County, State or National laws in any way limiting or controlling the actions or operations of those engaged upon the Work or affecting the materials supplied to or by them. He shall, at all times, observe and comply with all such valid and legally binding ordinances, laws, and regulations and shall protect and indemnify the OWNER and its representatives and agents against any claim or liability arising from, or based on, any violation of the same. He shall obtain and pay for all necessary permits and pay all fees required in connection with the Contract. CONTRACTOR shall provide the types and amounts of insurance as set forth in Information for Bidders and Form 817 and maintain them in effect. He shall take out and carry appropriate employer's liability insurance and public liability insurance.

XXIII. PATENT RIGHTS

The CONTRACTOR shall indemnify and save harmless the OWNER and its officers, agents, and representatives from all claims for damages arising from the infringements, or alleged infringements, of any Letters Patent or patent rights covering any material, appliance, or device used in or upon the Work or any part thereof.

All royalties for patents or patent infringement claims, that might be involved in the construction or use of the Work, shall be included in the Contract amount; and the CONTRACTOR shall satisfy all demands that may be made at any time for such and shall be liable for any damage or claims for patent infringements; and the CONTRACTOR shall, at his own expense, defend any and all suits or proceedings that may be instituted against the OWNER for infringement, or alleged infringement, of any patent or patents involved, or alleged to be involved, in the Work; and in case of any award for damages, the said CONTRACTOR shall pay such award.

XXIV. DEFENSE OF SUITS

The CONTRACTOR shall indemnify and hold harmless the OWNER and its consultants, agents and employees from and against all claims, damages, losses, and expenses, including, but not limited to, attorney fees, ("indemnification expense") arising out of or resulting from the performance of the Work or arising out of or resulting from the Contract Documents, including, without limitation, all indemnification expense regarding personal injury or death and/or damage to real or personal property or motor vehicles.

In claims against any person or entity indemnified under this section by an employee or the CONTRACTOR, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or a Subcontractor under Worker's or Workmen's compensation acts, disability benefit acts or other employee benefit acts.

XXV. CLAIMS FOR LABOR AND MATERIALS

The CONTRACTOR shall indemnify and save harmless the OWNER from all claims expenses and for judgments regarding labor done or materials furnished under this Contract, or any alterations or modifications thereof, including without limitation, reasonable Attorney's fees. CONTRACTOR shall furnish the OWNER with a Mechanic's Lien Waiver from all persons who have done Work, or furnished materials under this Contract. In case such waiver is not furnished, an amount necessary or sufficient, within the discretion of the OWNER, to meet the claims of the persons aforesaid, shall be retained, as herein specified, from the money due the CONTRACTOR under this Contract until the liabilities aforesaid shall be fully discharged or satisfactorily secured.

XXVI. COMPLETION OF WORK BY OWNER

If the Work to be done under this Contract shall be abandoned by the CONTRACTOR; or if this Contract shall be assigned, or the Work sublet by him, otherwise than as herein specified; or if at any time the OWNER shall be of the opinion that the performance of the Contract is unnecessarily or unreasonably delayed; or if the CONTRACTOR is willfully violating any of the conditions or covenants of this Contract, or of the Specifications, or is executing the same in bad faith or not in accordance with the terms thereof; or if the Work be not fully completed within the time named in this Contract for its completion, or within the time to which the completion of the Contract may be extended by the OWNER, the OWNER may notify the CONTRACTOR to discontinue all Work, or any part thereof under his Contract, by a written notice to be served upon the CONTRACTOR as herein provided.

The CONTRACTOR shall, within five (5) days of the service of said written notice, discontinue the Work, or such part thereof, and the OWNER shall thereupon have the power to contract for the completion of the Contract, in the manner prescribed by law; or to place such and so many persons as it may be deemed advisable, by contract or otherwise, to Work, and complete the Work herein described, or such part thereof; or to take possession of and use any of the materials, plant, tools, equipment, supplies, and property of every kind provided by the CONTRACTOR for the purpose of his Work; and to procure other materials and equipment for the completion of the same; and to charge the expense of said labor, materials and equipment to the CONTRACTOR.

The expense so charged shall be deducted and paid by the OWNER out of such moneys as may be due, or may at any time thereafter grow due to the CONTRACTOR under and by virtue of this Contract, or any part thereof; and in case such expense shall exceed the amount which would have been payable under the Contract, if the same had been completed by the CONTRACTOR, the CONTRACTOR or his surety shall pay the amount of such excess to the OWNER within five (5) days of written demand therefore; and in case such expense shall be less than the amount which would have been payable under this Contract, if the same had been completed by the CONTRACTOR, the OWNER shall pay such difference to the CONTRACTOR within five (5) days of written demand.

XXVII. PARTIAL AND FINAL ESTIMATES

On or about the last day of each month, the ENGINEER shall make an approximate estimate of the value of the Work done and of the materials incorporated into the Work.

The OWNER will pay the CONTRACTOR, within 30 days of receipt of an estimate, ninety-five percent (95%) of the total estimated value of the Work done, as estimated by the ENGINEER less previous payments. Partial payments will not be made whenever the amounts of the estimate or estimates of Work done since the last previous estimate are less than \$2,000.00.

The ENGINEER shall, as soon as practicable after the completion of Work, make a final certificate of the entire amount of the Work done under this Contract, and the value thereof, and the OWNER shall, within thirty (30) days after such final estimate is approved, pay the entire sum so found to be due hereunder, after deducting there from all previous payments and also all percentages and deductions to be retained under any of the provisions of this Contract.

Before payment of each estimate, the CONTRACTOR shall provide the OWNER with a Mechanic's Lien Waiver from the CONTRACTOR and all persons who have done Work or furnished materials under this Contract.

XXVIII. EXTRA WORK

Refer to Section 1.09.04 in the latest revision of the State of Connecticut Department of transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 817, including all supplements.

XXIX. PAYMENT

The OWNER, in consideration of the faithful performance by the CONTRACTOR of all his covenants, promises, and agreements contained herein, agrees to pay the CONTRACTOR for the full completion by him of the Work embraced in this Contract, in the manner and within the time herein specified and limited, and to the satisfaction and approval of the ENGINEER, the prices stipulated in the said Proposal hereto attached, such payment to be made at the times and in the manner and upon the conditions herein expressly provided. The OWNER also agrees to pay in addition such amounts as may be agreed upon for modifications and for extra Work.

XXX. GUARANTEE

The CONTRACTOR guarantees that the Work done under this Contract and the materials furnished by him and used in the construction of the same are free from defects or flaws. The guarantee is for a term of one (1) year from and after the date upon which the final estimate of the ENGINEER is formally approved by the OWNER. It is hereby agreed and understood that this guarantee shall not include making any repairs made necessary by any cause or causes other than defective materials furnished by, or defective Work done by, the CONTRACTOR.

XXXI. REPAIRS FOR ONE (1) YEAR

The CONTRACTOR further agrees that the said OWNER shall be and is hereby authorized to retain, out of the monies payable to the said CONTRACTOR under this Agreement, the sum of two and one half percent (2½%) of the amount of the Contract and to expend the same, in the manner hereinafter provided for, in making said repairs on the Work as may be required by the CONTRACTOR'S guarantee under Article XXX.

And it is further agree that if, at any time during the period of one (1) year from the date of the final estimate of the Work herein contracted for, any part of the Work done under this Contract shall be deemed by the ENGINEER to require repairing under the aforesaid Contractor's guarantee, then the said OWNER shall notify the said CONTRACTOR to make the repairs so required at no expense to the OWNER.

The CONTRACTOR shall undertake such replacements or repairs within twenty-four (24) hours after service of notice. If the CONTRACTOR unnecessarily delays or fails to make the ordered replacements or repairs within the time specified, or if any replacements or repairs are of such nature as not to allow for the time delay incident to the service of a notice, then the OWNER will have the right to make such replacements or repairs, and the expenses thereof shall be paid by the CONTRACTOR.

And the Town hereby agrees that upon the expiration of the said period of one (1) year, provided that the Work at the time shall be in good order, the CONTRACTOR shall be entitled to receive the whole or such part of the sum last aforesaid as may remain after the expense of making said repairs, in the manner aforesaid, shall have been paid therefrom, but if the said expense is in excess of the sum of two and one half percent (2½%) retained, the CONTRACTOR shall pay to the OWNER the amount of the excess.

It is, however, agreed that the Town may apply or keep the sum so retained for payment of other claims arising under the provisions of the contract document.

XXXII. RATE OF PROGRESS AND TIME OF COMPLETION

The CONTRACTOR shall commence Work within ten (14) calendar days of the date of the Notice to Proceed. The rate of progress shall be such that the whole Work shall be performed and the grounds cleared up in accordance with the Contract and Specifications within sixty (60) consecutive calendar days unless extensions of time shall be made for the reasons, and in the manner, stated under Article XXXIII, "Extension of Time".

XXXIII. EXTENSION OF TIME

The CONTRACTOR expressly covenants and agrees that, in undertaking to complete the Work within the time mentioned, he has taken into consideration, and made allowance for, all of the ordinary delays and hindrances incidental to such Work, whether growing out of delays in securing materials or workmen or otherwise. Should the CONTRACTOR, however, be substantially delayed in the prosecution and completion of the Work by any changes, additions, or omissions therein ordered in writing by the ENGINEER, or by fire, lightning, earthquake, tornado, cyclone, riot, insurrection, or war, or by the abandonment of the Work by the workman engaged therein through no fault of the CONTRACTOR, or by the discharge of all or any number of workmen in consequence of difficulties arising between the CONTRACTOR and such workmen, or by the neglect, delay, or default of any other CONTRACTOR of the OWNER, then the CONTRACTOR may, within five (5) days after the occurrence of the delay for which he claims allowance, notify the ENGINEER thereof in writing, and thereupon, and not otherwise, the CONTRACTOR shall be allowed such additional time for the completion of the Work as the ENGINEER, in his discretion, shall award in writing, and his decision shall be final and conclusive upon the parties.

XXXIV. DAMAGES FOR FAILURE TO COMPLETE ON TIME

The CONTRACTOR shall pay to the OWNER for each and every calendar day (including Saturdays, Sundays, and holidays) that he shall be in default in completing the entire Work in the time stipulated in Article XXXII, or within the extension of time he may be granted as provided in Article XXXIII, the sum of Three Hundred Dollars (\$300.00) per day. This sum is hereby agreed upon not as a penalty but as liquidated damages which OWNER will suffer by reason of such default, time being of the essence of the Contract and a material consideration thereof. The OWNER shall have the right to deduct the amount of any such damages from any monies due the CONTRACTOR under this Contract.

XXXV. NO WAIVER OF RIGHTS

No certificate given or payment made under this Contract, except the final certificate or final payment, shall be evidence of the performance of the Contract either wholly or in part, and no payment shall be construed to be an acceptance of defective Work or improper materials. No act of the OWNER or of the ENGINEER, or of any representatives of either of them in inspecting the Work, nor any extension of time for the completion of the Work, shall be regarded or taken as an acceptance of such Work, or any part thereof, or materials used therein or thereof, either wholly or in part; but such acceptance shall be evidenced only by the final certificate of the ENGINEER.

Before any final certification shall be allowed, the CONTRACTOR shall be required, and he hereby agrees, to sign and attest on said certificate a statement that he accepts the same in full payment and settlement of all claims on account of Work done and material furnished under this Contract, and furthermore, that all claims for materials provided or labor performed have been paid and satisfied in full. No waiver of any breach of this Contract by the OWNER or anyone acting for it, or on its behalf, shall be held as a waiver of any other or subsequent breach thereof.

XXXVI. MANDATORY NEGOTIATION

CONTRACTOR and the Town agree that they will attempt to negotiate in good faith any dispute of any nature arising under this contract. The parties shall negotiate in good faith at not less than two negotiation sessions prior to seeking any resolution of any dispute under the provisions of arbitration paragraph of this contract. Each party shall have the right to legal representation at any such negotiation session.

XXXVII. ARBITRATION

Any dispute or question arising under the provisions of this contract, which has not been resolved under the Mandatory Negotiation paragraph of this contract, shall be determined by arbitration. Arbitration proceedings shall occur at a neutral location in Branford, Connecticut, and shall be conducted in accordance with the rules then applicable of the American Arbitration Association. Arbitration shall proceed before a panel of one arbitrator to be selected by American Arbitration Association. The decision of the Arbitrator shall be final and may be entered in any court having jurisdiction thereof. Each party shall pay one-half of all costs and expenses of such arbitration.

XXXVIII. OWNER'S RIGHT TO USE

The OWNER reserves the right to use or occupy any portion of the Work considered by the ENGINEER as ready for use or occupancy. Such use or occupancy shall not be held, in any way, as final acceptance of the Work or any portion thereof, or as a waiver of any portion of this Contract.

XXXIX. VERIFICATION OF DATA

The quantities of Work to be done and the materials to be furnished under this Contract, are approximate estimates for the purpose of comparing bids on a uniform basis. Neither the OWNER nor the ENGINEER is to be held responsible for the data or information given relative to said quantities or that given on the Plans relative to existing conditions. The CONTRACTOR has judged for himself as to such quantities and as to other circumstances affecting the cost of the performance of this Contract, and he shall not at any time assert that there was any misunderstanding in regard to the character or amount of Work to be done and materials and labor to be furnished.

XL. CONTRACTOR'S WAGE CERTIFICATION FORM

If applicable, the CONTRACTOR or his authorized agent will be required to sign the CONTRACTOR'S Wage Certification Form at the time of Contract execution. The CONTRACTOR shall be responsible to comply with the Connecticut Statues Section 31-53 regarding wage rates and certified payroll, and any related regulations or laws which may be applicable.

XLI. VERBAL STATEMENTS NOT BINDING

It is understood and agreed that the written terms and provisions of this Agreement shall supersede all prior verbal statements of the Town Inspector or other representatives of the OWNER, and such statements shall not be effective or be construed as entering into or forming a part of, or altering in anyway whatsoever, the written Agreement.

XLII. FINAL ESTIMATE CONSTITUTES RELEASE

It is agreed that acceptance by the CONTRACTOR of the last payment made, under the provisions of Article XXVII, shall operate as and shall be a release to the OWNER, and every agent thereof, from all claims and liability to CONTRACTOR for anything done or furnished for, or relating to, the Work or for any act or neglect of the OWNER or of any agent thereof, except any claim against the OWNER for the remainder, if any, of the amounts kept or retained by the OWNER as percentages or deductions.

No payment, however, final or otherwise, shall operate to release the CONTRACTOR or his sureties from any obligations under this Contract.

XLIII. DELAYS OR TERMINATION BY GOVERNMENTAL AUTHORITIES

Notwithstanding any other provision(s) of this contract, the parties agree that in the event of a stop Work order from the State Department of Transportation, Department of Energy and Environmental Protection or any other State or Federal agency, no additional compensation will be made by the OWNER to the CONTRACTOR for delays, inconvenience, or damage sustained by CONTRACTOR due to such order, including, without limitation, damages for loss of use of equipment or idle equipment. Similarly, in the event of a termination of the project by the State DOT, DEEP or any other State or Federal agency, no additional compensation will be made by the OWNER to the CONTRACTOR for the termination, or for any delay, inconvenience or damage sustained by CONTRACTOR due to such termination, including, without limitation, damages for loss of use of equipment or idle equipment. In the event of such termination, the ENGINEER shall prepare a final certificate for the entire amount of Work done up to the effective date of termination. The provisions of Sections XXX (Guarantee) and XXXI (Repairs) shall apply to all Work completed as of the effective date of any stop Work order, as if the effective date was the date upon which the final estimate of the ENGINEER is formally approved by the Town.

XLIV. VALIDITY OF AGREEMENT

The provision of this Agreement shall be binding upon the Parties and their respective successor or assigns.

IN WITNESS WHEREOF, the said parties hereto have caused this instrument to be signed by their respective duly constituted officers, attested, and sealed pursuant to proper resolutions.

Signed and sealed
in the presence of

Town of Branford

(Witness)

First Selectman

(Witness)

CONTRACTOR

Witness)

(Duly Authorized)

(Witness)

PERFORMANCE BOND

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

CONTRACTOR (Name and Address):

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

OWNER (Name and Address):

**Town of Branford
1019 Main Street
P. O. Box 150
Branford, CT 06405**

CONTRACT

Date:

Amount:

Description (Name and Location):

**Low Pressure Sanitary Force Main
Riverview Ave**

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest:

Signature and Title

CONTRACTOR AS PRINCIPAL

Company:

Signature: _____ (Seal)

Name and Title:

SURETY

(Seal)

Surety's Name and Corporate Seal

By:

Signature and Title

(Attach Power of Attorney)

Attest:

Signature and Title:

EJCDC No. C-610 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

2. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 3.1.

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

3.1. Owner has notified Contractor and Surety, at the addresses described in Paragraph 10 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and

3.2. Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 3.1; and

3.3. Owner has agreed to pay the Balance of the Contract Price to:

1. Surety in accordance with the terms of the Contract;
2. Another contractor selected pursuant to Paragraph 4.3 to perform the Contract.

4. When Owner has satisfied the conditions of Paragraph 3, Surety shall promptly and at Surety's expense take one of the following actions:

4.1. Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or

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

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and Contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or

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

1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
2. Deny liability in whole or in part and notify Owner citing reasons therefor.

5. If Surety does not proceed as provided in Paragraph 4 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 4.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

6. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To a limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

6.1. The responsibilities of Contractor for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions or failure to act of Surety under Paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

7. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the 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 Owner or its heirs, executors, administrators, or successors.

8. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.

12.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3. Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker
Owner's Representative (engineer or other party)

PAYMENT BOND

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

CONTRACTOR (Name and Address):
Business):

SURETY (Name and Address of Principal Place of

OWNER (Name and Address):
TOWN OF BRANFORD
1019 MAIN STREET, P. O. BOX 150
BRANFORD, CT 06405

CONTRACT

Date:

Amount:

Description (Name and Location):

LOW PRESSURE SANITARY FORCE MAIN
RIVERVIEW AVENUE, BRANFORD, CONNECTICUT

BOND

Bond Number:

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Payment Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL
Company:

SURETY

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

Attest: _____
Signature and Title

CONTRACTOR AS PRINCIPAL
Company:

SURETY

Signature: _____ (Seal)
Name and Title:

Surety's Name and Corporate Seal (Seal)

By: _____
Signature and Title
(Attach Power of Attorney)

Attest: _____
Signature and Title:

EJCDC No. C-615 (2002 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, the American Institute of Architects, the American Subcontractors Association, and the Associated Specialty Contractors.

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2. Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1. Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the addresses described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2. Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to Surety and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. When a Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at Surety's expense take the following actions:

6.1. Send an answer to that Claimant, with a copy to Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2. Pay or arrange for payment of any undisputed amounts.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1. Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2. Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3. Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or comply with the other terms thereof.

**FOR INFORMATION ONLY – Name, Address and Telephone
Surety Agency or Broker:
Owner's Representative (engineer or other party):**

FOR INFORMATION ONLY – Name, Address and Telephone

Surety Agency or Broker:

Owner's Representative (engineer or other party):

FOR INFORMATION ONLY – Name, Address and Telephone

Surety Agency or Broker:

Owner's Representative (engineer or other party):

**Engineers Joint Documents Committee
Design and Construction Related Documents
Instructions and License Agreement**

Instructions

Before you use any EJCDC document:

1. Read the License Agreement. You agree to it and are bound by its terms when you use the EJCDC document.
2. Make sure that you have the correct version for your word processing software.

How to Use:

1. While EJCDC has expended considerable effort to make the software translations exact, it can be that a few document controls (e.g., bold, underline) did not carry over.
2. Similarly, your software may change the font specification if the font is not available in your system. It will choose a font that is close in appearance. In this event, the pagination may not match the control set.
3. If you modify the document, you must follow the instructions in the License Agreement about notification.
4. Also note the instruction in the License Agreement about the EJCDC copyright.

License Agreement

You should carefully read the following terms and conditions before using this document. Commencement of use of this document indicates your acceptance of these terms and conditions. If you do not agree to them, you should promptly return the materials to the vendor, and your money will be refunded.

The Engineers Joint Contract Documents Committee ("EJCDC") provides **EJCDC Design and Construction Related Documents** and licenses their use worldwide. You assume sole responsibility for the selection of specific documents or portions thereof to achieve your intended results, and for the installation, use, and results obtained from **EJCDC Design and Construction Related Documents**.

You acknowledge that you understand that the text of the contract documents of **EJCDC Design and Construction Related Documents** has important legal consequences and that consultation with an attorney is recommended with respect to use or modification of the text. You further acknowledge that EJCDC documents are protected by the copyright laws of the United States.

License:

You have a limited nonexclusive license to:

1. Use **EJCDC Design and Construction Related Documents** on any number of machines owned, leased or rented by your company or organization.
2. Use **EJCDC Design and Construction Related Documents** in printed form for bona fide contract documents.
3. Copy **EJCDC Design and Construction Related Documents** into any machine readable or printed form for backup or modification purposes in support of your use of **EJCDC Design and Construction Related Documents**.

You agree that you will:

1. Reproduce and include EJCDC's copyright notice on any printed or machine-readable copy, modification, or portion merged into another document or program. All proprietary rights in **EJCDC Design and Construction Related Documents** are and shall remain the property of EJCDC.
2. Not represent that any of the contract documents you generate from **EJCDC Design and Construction Related Documents** are EJCDC documents unless (i) the document text is used without alteration or (ii) all additions and changes to, and deletions from, the text are clearly shown.

You may not use, copy, modify, or transfer EJCDC Design and Construction Related Documents, or any copy, modification or merged portion, in whole or in part, except as expressly provided for in this license. Reproduction of EJCDC Design and Construction Related Documents in printed or machine-readable format for resale or educational purposes is expressly prohibited.

If you transfer possession of any copy, modification or merged portion of EJCDC Design and Construction Related Documents to another party, your license is automatically terminated.

Term:

The license is effective until terminated. You may terminate it at any time by destroying **EJCDC Design and Construction Related Documents** altogether with all copies, modifications and merged portions in any form. It will also terminate upon conditions set forth elsewhere in this Agreement or if you fail to comply with any term or condition of this Agreement. You agree upon such termination to destroy **EJCDC Design and Construction Related Documents** along with all copies, modifications and merged portions in any form.

Limited Warranty:

EJCDC warrants the CDs and diskettes on which **EJCDC Design and Construction Related Documents** is furnished to be free from defects in materials and workmanship under normal use for a period of ninety (90) days from the date of delivery to you as evidenced by a copy of your receipt.

There is no other warranty of any kind, either expressed or implied, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose. Some states do not allow the exclusion of implied warranties, so the above exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

EJCDC does not warrant that the functions contained in **EJCDC Design and Construction Related Documents** will meet your requirements or that the operation of **EJCDC Design and Construction Related Documents** will be uninterrupted or error free.

Limitations of Remedies:

EJCDC's entire liability and your exclusive remedy shall be:

1. the replacement of any document not meeting EJCDC's "Limited Warranty" which is returned to EJCDC's selling agent with a copy of your receipt, or
2. if EJCDC's selling agent is unable to deliver a replacement CD or diskette which is free of defects in materials and workmanship, you may terminate this Agreement by returning EJCDC Document and your money will be refunded.

In no event will EJCDC be liable to you for any damages, including any lost profits, lost savings or other incidental or consequential damages arising out of the use or inability to use **EJCDC Design and Construction Related Documents** even if EJCDC has been advised of the possibility of such damages, or for any claim by any other party.

Some states do not allow the limitation or exclusion of liability for incidental or consequential damages, so the above limitation or exclusion may not apply to you.

General:

You may not sublicense, assign, or transfer this license except as expressly provided in this Agreement. Any attempt otherwise to sublicense, assign, or transfer any of the rights, duties, or obligations hereunder is void.

This Agreement shall be governed by the laws of the State of Virginia. Should you have any questions concerning this Agreement, you may contact EJCDC by writing to:

Arthur Schwartz, Esq.
General Counsel

National Society of Professional Engineers
1420 King Street
Alexandria, VA 22314

Phone: (703) 684-2845
Fax: (703) 836-4875
e-mail: aschwartz@nspe.org

You acknowledge that you have read this agreement, understand it and agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement between us which supersedes any proposal or prior agreement, oral or written, and any other communications between us relating to the subject matter of this agreement.

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES



ASCE American Society
of Civil Engineers

PE National Society of
Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by



CONSTRUCTION SPECIFICATIONS INSTITUTE

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

Copyright © 2007 National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314-2794
(703) 684-2882
www.nspe.org

American Council of Engineering Companies
1015 15th Street N.W., Washington, DC 20005
(202) 347-7474
www.acec.org

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400
(800) 548-2723
www.asce.org

Associated General Contractors of America
2300 Wilson Boulevard, Suite 400, Arlington, VA 22201-3308
(703) 548-3118
www.agc.org

The copyright for this EJCDC document is owned jointly by the four EJCDC sponsoring organizations and held in trust for their benefit by NSPE.

**STANDARD GENERAL CONDITIONS OF THE
CONSTRUCTION CONTRACT**

TABLE OF CONTENTS

	Page
Article 1 – Definitions and Terminology	1
1.01 Defined Terms.....	1
1.02 Terminology	5
Article 2 – Preliminary Matters	6
2.01 Delivery of Bonds and Evidence of Insurance	6
2.02 Copies of Documents	6
2.03 Commencement of Contract Times; Notice to Proceed.....	6
2.04 Starting the Work	7
2.05 Before Starting Construction	7
2.06 Preconstruction Conference; Designation of Authorized Representatives	7
2.07 Initial Acceptance of Schedules	7
Article 3 – Contract Documents: Intent, Amending, Reuse	8
3.01 Intent.....	8
3.02 Reference Standards.....	8
3.03 Reporting and Resolving Discrepancies.....	9
3.04 Amending and Supplementing Contract Documents	9
3.05 Reuse of Documents	10
3.06 Electronic Data.....	10
Article 4 – Availability of Lands; Subsurface and Physical Conditions; Hazardous Environmental Conditions; Reference Points.....	11
4.01 Availability of Lands.....	11
4.02 Subsurface and Physical Conditions.....	11
4.03 Differing Subsurface or Physical Conditions	12
4.04 Underground Facilities.....	13
4.05 Reference Points.....	14
4.06 Hazardous Environmental Condition at Site	14
Article 5 – Bonds and Insurance.....	16
5.01 Performance, Payment, and Other Bonds.....	16
5.02 Licensed Sureties and Insurers.....	16
5.03 Certificates of Insurance	17
5.04 Contractor’s Insurance	17
5.05 Owner’s Liability Insurance.....	19
5.06 Property Insurance.....	19
5.07 Waiver of Rights	20
5.08 Receipt and Application of Insurance Proceeds	21

5.09	Acceptance of Bonds and Insurance; Option to Replace	21
5.10	Partial Utilization, Acknowledgment of Property Insurer.....	22
Article 6 – Contractor’s Responsibilities		22
6.01	Supervision and Superintendence.....	22
6.02	Labor; Working Hours	22
6.03	Services, Materials, and Equipment	22
6.04	Progress Schedule	23
6.05	Substitutes and “Or-Equals”	23
6.06	Concerning Subcontractors, Suppliers, and Others.....	25
6.07	Patent Fees and Royalties	27
6.08	Permits.....	27
6.09	Laws and Regulations	28
6.10	Taxes	28
6.11	Use of Site and Other Areas.....	28
6.12	Record Documents.....	29
6.13	Safety and Protection	29
6.14	Safety Representative.....	30
6.15	Hazard Communication Programs.....	30
6.16	Emergencies	30
6.17	Shop Drawings and Samples	31
6.18	Continuing the Work.....	32
6.19	Contractor’s General Warranty and Guarantee	33
6.20	Indemnification	33
6.21	Delegation of Professional Design Services.....	34
Article 7 – Other Work at the Site.....		35
7.01	Related Work at Site	35
7.02	Coordination.....	35
7.03	Legal Relationships.....	36
Article 8 – Owner’s Responsibilities.....		36
8.01	Communications to Contractor.....	36
8.02	Replacement of Engineer	36
8.03	Furnish Data	36
8.04	Pay When Due.....	36
8.05	Lands and Easements; Reports and Tests.....	36
8.06	Insurance.....	36
8.07	Change Orders.....	37
8.08	Inspections, Tests, and Approvals	37
8.09	Limitations on Owner’s Responsibilities	37
8.10	Undisclosed Hazardous Environmental Condition	37
8.11	Evidence of Financial Arrangements.....	37
8.12	Compliance with Safety Program.....	37
Article 9 – Engineer’s Status During Construction.....		37
9.01	Owner’s Representative	37

9.02	Visits to Site	37
9.03	Project Representative.....	38
9.04	Authorized Variations in Work	38
9.05	Rejecting Defective Work.....	38
9.06	Shop Drawings, Change Orders and Payments	39
9.07	Determinations for Unit Price Work	39
9.08	Decisions on Requirements of Contract Documents and Acceptability of Work	39
9.09	Limitations on Engineer’s Authority and Responsibilities	39
9.10	Compliance with Safety Program	40
Article 10 – Changes in the Work; Claims		40
10.01	Authorized Changes in the Work	40
10.02	Unauthorized Changes in the Work.....	41
10.03	Execution of Change Orders.....	41
10.04	Notification to Surety.....	41
10.05	Claims.....	41
Article 11 – Cost of the Work; Allowances; Unit Price Work		42
11.01	Cost of the Work.....	42
11.02	Allowances	45
11.03	Unit Price Work	45
Article 12 – Change of Contract Price; Change of Contract Times		46
12.01	Change of Contract Price	46
12.02	Change of Contract Times	47
12.03	Delays	47
Article 13 – Tests and Inspections; Correction, Removal or Acceptance of Defective Work.....		48
13.01	Notice of Defects.....	48
13.02	Access to Work	48
13.03	Tests and Inspections	49
13.04	Uncovering Work.....	49
13.05	Owner May Stop the Work.....	50
13.06	Correction or Removal of Defective Work	50
13.07	Correction Period	50
13.08	Acceptance of Defective Work.....	51
13.09	Owner May Correct Defective Work	52
Article 14 – Payments to Contractor and Completion		52
14.01	Schedule of Values.....	52
14.02	Progress Payments	52
14.03	Contractor’s Warranty of Title.....	55
14.04	Substantial Completion.....	55
14.05	Partial Utilization	56
14.06	Final Inspection	57
14.07	Final Payment.....	57
14.08	Final Completion Delayed	58

14.09 Waiver of Claims	58
Article 15 – Suspension of Work and Termination	59
15.01 Owner May Suspend Work.....	59
15.02 Owner May Terminate for Cause	59
15.03 Owner May Terminate For Convenience	60
15.04 Contractor May Stop Work or Terminate.....	60
Article 16 – Dispute Resolution	61
16.01 Methods and Procedures	61
Article 17 – Miscellaneous	61
17.01 Giving Notice	61
17.02 Computation of Times	62
17.03 Cumulative Remedies	62
17.04 Survival of Obligations	62
17.05 Controlling Law	62
17.06 Headings.....	62

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
 5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
 7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
 8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
 9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
 10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
 11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.
39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.
44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.
48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *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, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.
51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an

addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
4. When “furnish,” “install,” “perform,” or “provide” is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, “provide” is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

- A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 Copies of Documents

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on

Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

- A. Standards, Specifications, Codes, Laws, and Regulations
 1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
 - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.
- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;
2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier shall not:
1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or
 2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

- A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:
1. is of such a nature as to establish that any “technical data” on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or
 2. is of such a nature as to require a change in the Contract Documents; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. 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, 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 as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner’s obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
 - a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or
 - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and
2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all such information and data;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents;
 - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the

consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

- C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, 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 a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- H. To the fullest extent permitted by Laws and Regulations, Contractor shall 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 a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also

meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
 - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
 - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
 - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

- a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
 - b. by any other person for any other reason;
5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and
 6. 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.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;
 2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
 3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
 4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
 5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
 6. include completed operations coverage:
 - a. Such insurance shall remain in effect for two years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
 2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.
 3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
 4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
 5. allow for partial utilization of the Work by Owner;
 6. include testing and startup; and
 7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,

members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's

interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR’S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, 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, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. 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. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner’s written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *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.

- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment 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.

6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
 - 1. "*Or-Equal*" Items: If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and
 - 3) it has a proven record of performance and availability of responsive service.
- b. Contractor certifies that, if approved and incorporated into the Work:
- 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - 1) shall certify that the proposed substitute item will:
 - a) perform adequately the functions and achieve the results called for by the general design,
 - b) be similar in substance to that specified, and
 - c) be suited to the same use as that specified;
 - 2) will state:
 - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
 - b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

- c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
 - 3) will identify:
 - a) all variations of the proposed substitute item from that specified, and
 - b) available engineering, sales, maintenance, repair, and replacement services; and
 - 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.
- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- F. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be

required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.
- C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:
1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor
 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.
- F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner,

Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of 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. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors 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 any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall 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 any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all 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. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear 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 such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.
2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
3. To the fullest extent permitted by Laws and Regulations, Contractor shall 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 any claim or action, legal or equitable, brought

by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. 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, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and

shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

- A. 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.

6.16 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to 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.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
- b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

- a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
- b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
- c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
- d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. 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 and approval of that submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. 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.

6.18 *Continuing the Work*

- A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

- 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 representation of Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. use or occupancy of the Work or any part thereof by Owner;
 - 5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;
 - 6. any inspection, test, or approval by others; or
 - 7. any correction of defective Work by Owner.

6.20 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, Contractor shall 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, 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 any of them may be liable .

- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) 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 any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.
- B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 – OTHER WORK AT THE SITE

7.01 Related Work at Site

- A. Owner may perform other work related to the Project at the Site with Owner’s employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
 - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
 - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner’s employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.
- C. If the proper execution or results of any part of Contractor’s Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor’s Work. Contractor’s failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor’s Work except for latent defects and deficiencies in such other work.

7.02 Coordination

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
 - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
 - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
 - 3. the extent of such authority and responsibilities will be provided.

- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. 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 incident thereto, 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.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. 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 pursuant to Paragraph 6.13.D.

ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

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

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or

continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, 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 incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents 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.

- B. 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 incident thereto, 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.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in 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 by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:
 - 1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
 - 2. 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; and
 - 3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

- A. 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.

10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data

shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
 2. approve the Claim; or
 3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of

said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.
2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not

limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.
- C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.
- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances:*
 1. Contractor agrees that:
 - a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance:*
 1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to

the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
 - 2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
 - 3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee*: The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or
2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or

neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. 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.
- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 Notice of Defects

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 Access to Work

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests 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 and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
 - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;
 - 2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
 - 3. as otherwise specifically provided in the Contract Documents.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
- E. If any Work (or the work of others) 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.
- F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

- C. If it is found that the uncovered Work is defective, Contractor shall pay 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 such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

- A. 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, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay 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 such correction or removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or
 2. correct such defective Work; or
 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. 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 such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay 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) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.
- C. 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) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

- 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an

Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. 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 have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or

- involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or
- b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
 - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
 - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;
 - b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - c. there are other items entitling Owner to a set-off against the amount recommended; or
 - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.
3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before

final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.
 - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof 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 is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
 - b. consent of the surety, if any, to final payment;
 - c. a list of all Claims against Owner that Contractor believes are unsettled; and
 - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying

documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
 1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
 2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

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 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will justify termination for cause:
1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
 2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
 3. Contractor's repeated disregard of the authority of Engineer; or
 4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
 2. 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
 3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds 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) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when

so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, 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;
 - 3. 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) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
 - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated 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, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) 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 Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 – DISPUTE RESOLUTION

16.01 Methods and Procedures

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agrees with the other party to submit the Claim to another dispute resolution process; or
 - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 Giving Notice

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions 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 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 Documents. 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.

17.04 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, 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 *Controlling Law*

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

17.06 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

Part C
Supplemental Contract Documents

TECHNICAL SPECIFICATIONS

TOWN OF BRANFORD

The material and construction methods for the work specified in this contract shall conform with the applicable provisions of the State of Connecticut, Department of Transportation specifications entitled *Standard Specifications for Roads, Bridges and Incidental Construction, Form 817*, Dated 2016, *Supplemental Specifications to the Standard Specifications for Roads, Bridges and Incidental Construction Form 817*, Last Revised July 2017 and the Special Provisions contained in the Contract Documents. Form 817 and supplemental specifications may be purchased from:

Connecticut Department of Transportation
Plan Sales Office
160 Pascone Place
Newington, CT 06111

Or may be viewed at the State of Connecticut Department of Transportation's website at <http://www.ct.gov/dot>

All references to Commissioner, Department, Engineer, and State anywhere within the Contract documents and Form 817 shall be interpreted to mean the Town of Branford Town Engineer or duly authorized agent of the Town. Any questions or ambiguity regarding any definitions shall be brought to the immediate attention of the Town

SECTION 01010
SUMMARY OF WORK

PART 1 - GENERAL

1.01 LOCATION OF WORK

- A. The Work of this Contract is located on a section of Riverview Avenue in the Town of Branford, CT.

1.02 GENERAL REQUIREMENTS

- A. The Work of this Contract includes furnishing of all tools, materials, equipment, labor, and supervision required to complete the installation of a Low Pressure Sanitary Force Main in Riverview Avenue as indicated on the Drawings, as specified herein, and as evidently required to complete the Work.
- B. The CONTRACTOR shall visit the site and fully inform himself of all existing and controlling conditions with respect to his Work, the limitations of space in the Work area, and the accessibility to and from the Work site.
- C. The CONTRACTOR shall develop a plan of operations and a sequence of construction that will provide for the completion of the Work in an orderly and unobtrusive manner that shall maintain safe vehicle and pedestrian traffic flows through the Work area, as well as maintain access to all properties within or adjacent to the Work area.
- D. The CONTRACTOR is solely responsible for means and methods in performance of the Work.
- E. Surplus, excavated, or removed materials shall be properly disposed of off-site at no additional cost to the OWNER.

1.03 SCOPE OF WORK

The scope of this project consists of, but is not limited to the following:

- A. The scope of work shall consist of providing all labor, equipment and materials to complete in every detail for the installation of 400± linear feet of low pressure sanitary force main, including:
1. Excavation , bedding and backfill as necessary for all underground piping as indicated on the plans.
 2. All piping, fitting, etc. to provide lateral connection opportunities for 13 connections
 3. All pavement repair (roadway and driveway as necessary).

END OF SECTION 1010

SECTION 01046
CONTROL OF WORK

SUBSECTION INDEX

PART 1 – GENERAL

- 1.01 Hours of Construction
- 1.02 Occupying Private Land
- 1.03 Utility Locations
- 1.04 Dimension of Existing Structures
- 1.05 Open Excavations
- 1.06 Interference with and Protection of Streets
- 1.07 Care and Protection of Property
- 1.08 Protection and Relocation of Existing Structures and Utilities
- 1.09 Cooperation within this Contract
- 1.10 Cleanup and Disposal of Excess Material
- 1.11 Storage and Materials and Equipment
- 1.12 Safety
- 1.13 Lines, Grades, and Measurements
- 1.14 Work to Conform
- 1.15 Noise

PART 1 – GENERAL

1.01 HOURS OF CONSTRUCTION

- A. It is the CONTRACTOR'S responsibility to furnish equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of Work and a rate of progress which will insure the completion of the Work within the Contract Time. If at any time it appears to the ENGINEER to be inefficient, inappropriate, or insufficient for securing the quality of Work required or for producing the rate of progress aforesaid, the ENGINEER may inform the CONTRACTOR. Failure of the ENGINEER to give such notice shall in no way relieve the CONTRACTOR of his obligations to secure the quality of the Work and rate of progress required.
- B. Normal construction activity in all areas shall take place only between the hours of 7 a.m. to 5:00 p.m., excluding Sundays and legal holidays. Work outside the above time periods will be permitted only with the approval of the OWNER.

1.02 OCCUPYING OF PRIVATE LAND

- A. The CONTRACTOR shall not (except after written consent from the proper parties) enter or occupy with men, tools, materials, or equipment, and land outside the rights of way or property of the OWNER. A copy of the written consent shall be given to the OWNER.

- B. The CONTRACTOR shall confine his operations and Work to within the project limits specified on the drawings and, unless otherwise depicted on the drawings, to within the road right-of-way. When operations and/or disturbance are required on private property, the CONTRACTOR shall priorly coordinate with the Town to insure that the Town has obtained the necessary releases or easements from the property owners, and to verify the terms and conditions of these releases or easements.

1.03 UTILITY LOCATIONS

- A. It is the responsibility of the CONTRACTOR to verify information and data shown on the Drawings with respect to underground and above ground utilities on/adjacent to the project area. The information and data relative to subsurface conditions or utilities depicted on the Drawings have been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes or other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents. The CONTRACTOR shall have priorly made due allowance in his Bid proposal any variance which may potentially exist between the aforesaid information depicted in the drawings or Contract Documents and the actual surface and/or subsurface conditions actually encountered.

1.04 DIMENSION OF EXISTING STRUCTURES

- A. Where the dimensions and locations of existing structures are of importance in the installation of connection of any part of the Work, the CONTRACTOR shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependant on the correctness of such information.

1.05 OPEN EXCAVATIONS

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, fencing, caution signs, lights, and other means to prevent accidents to persons and damage to property. The CONTRACTOR shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and Workmen. Bridges provided for access during construction shall be removed when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the ENGINEER. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the ENGINEER may require special construction procedures such as limiting the length of the open trench, and prohibiting stacking excavating material in the street.
- B. No open trenches shall be permitted to remain open overnight.

1.06 INTERFERENCE WITH AND PROTECTION OF STREETS

- A. The CONTRACTOR shall not close or obstruct any portion of a street, road, or private way without obtaining permits therefor from the proper authorities. If any street, road, or private way shall be rendered unsafe by the CONTRACTOR'S operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.
- B. Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the CONTRACTOR, who shall assume and have full responsibility for the adequacy and safety of provisions made therefor.

- C. The CONTRACTOR shall, at least 24 hours in advance, notify the Police and Fire Departments in writing, with a copy to the ENGINEER, if the closure of a street or road is necessary. He shall cooperate with the Police Department in the establishment of alternate routes and shall provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion. The Police Department shall determine the adequacy of detour signs.

1.07 CARE AND PROTECTION OF PROPERTY

- A. The CONTRACTOR shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to the public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the CONTRACTOR, such property shall be restored by the CONTRACTOR, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the ENGINEER.

1.08 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. The CONTRACTOR shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The CONTRACTOR shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the CONTRACTOR'S operations shall be repaired by him at his expense.
- B. Assistance will be given to the CONTRACTOR in determining the location of existing services. The CONTRACTOR, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, drain lines, and sewers.) Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the CONTRACTOR.
- C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the Work under the Contract and all costs in connection therewith shall be included in the appropriate item on the Bid Form.
- D. The CONTRACTOR shall notify all utility companies in writing at least 72 hours (excluding Saturdays, Sundays, and legal holidays) before excavating in any public way. CONTRACTOR shall also notify Connecticut Call-Before-You-Dig at 1-800-922-4455 at least 72 hours prior to start of Work.

1.09 COOPERATION WITHIN THIS CONTRACT

- A. All firms or persons authorized to perform any Work under this Contract shall cooperate with General CONTRACTOR and his subcontractors or trades, and shall assist in incorporating the Work of other trades where necessary or required.
- B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the ENGINEER.

1.10 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

- A. During the course of Work, the CONTRACTOR shall keep the site of his operations in as clean and neat a condition as possible. He shall dispose of all residues resulting from the construction Work and, at the conclusion of the Work, he shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the Work in a neat and orderly condition.
- B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the CONTRACTOR and his subcontractors shall comply with all applicable Federal, State, and local laws, and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and elsewhere in the Specifications.
- C. The CONTRACTOR is advised that the disposal of excess excavated material in wetlands, stream corridors, and flood plains is strictly prohibited even if the permission of the property OWNER is obtained. Any violation of this restriction by the CONTRACTOR or any person employed by him, will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. Therefore, the CONTRACTOR will be required to remove the fill at his own expense and restore the area impacted.

1.11 STORAGE OF MATERIALS AND EQUIPMENT

- A. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Materials and equipment shall be kept neatly piled and compactly stored in such locations as will cause minimum of inconvenience to public travel and adjoining owners, tenants, and occupants.

1.12 SAFETY

- A. The CONTRACTOR shall take all necessary precautions and provide all necessary safeguards to prevent personal injury and property damage. The CONTRACTOR shall provide protection for all persons including but not limiting his employees and employees of other contractors or subcontractors; members of the public; and employees, agents, and representatives of the OWNER, the ENGINEER, and regulatory agencies that may be on or property including but not limited to structures, pipes, and utilities, above and below ground.
- B. The CONTRACTOR shall provide and maintain all necessary safety equipment such as fences, barriers, signs, lights, walkways, guards and fire prevention and fire-fighting equipment and shall take such other actions as is required to fulfill his obligations under this subsection.
- C. The CONTRACTOR shall comply with all applicable Federal, State, and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property.
- D. The CONTRACTOR shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This responsible person shall have the authority to take immediate action to correct unsafe or hazardous conditions and to enforce safety precautions and programs.

- E. Jobsite safety is solely the responsibility of the CONTRACTOR. Review of the construction by the ENGINEER is for conformance with design aspects only, not to review the CONTRACTOR'S provisions for jobsite safety. Lack of comment on the part of the ENGINEER with regard to jobsite safety is not to be interpreted as approval of jobsite safety.

1.13 LINES, GRADES AND MEASUREMENTS

- A. The CONTRACTOR shall employ a competent land surveyor, licensed in the State of Connecticut as a Professional Land Surveyor, who shall establish all lines, elevations, reference marks, batter boards, etc., needed by the CONTRACTOR during the progress of the Work, and from time to time verify such marks by instruments or other appropriate means.
- B. The ENGINEER shall be permitted at all times to check the lines, elevations, reference marks, batter boards, etc., set by the CONTRACTOR, who shall correct any errors in lines, elevations, reference marks, batter boards, etc., disclosed by such check. Such a check shall not diminish in any way the responsibility of the CONTRACTOR for the accurate and satisfactory construction and completion of the entire Work.
- C. The CONTRACTOR shall make, check, and be responsible for all measurements and dimensions necessary for the proper construction of and the prevention of the misfittings in the Work.

1.14 WORK TO CONFORM

- A. During its progress and on its completion, the Work shall conform truly to the lines, levels, and grades indicated on the Drawings or given by the ENGINEER and shall be built in a thoroughly substantial and Workmanlike manner, in strict accordance with the Drawings, Specifications, and other Contract Documents and the directions given by the ENGINEER.
- B. All Work done without instructions having been given therefor by the ENGINEER, without proper lines or levels, or performed during the absence of the ENGINEER, will not be estimated or paid for except when such Work is authorized by the ENGINEER in writing. Work so done may be ordered uncovered or taken down, removed, and replaced at the CONTRACTOR'S expense.

1.15 NOISE

- A. All the CONTRACTOR'S operations shall conform to the Town of Branford Noise Ordinances.

END OF SECTION

SECTION 01295
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The Schedule of Values for all of the Work shall include quantities and prices of items which, when added together, equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve the basis for progress payments during the performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of work.
- B. The format of the Schedule of Values shall be a breakdown by Specification Section.
- C. The unit prices published in the Schedule of Values will be the basis of payment for any change orders or additions to the original contract.

1.02 SUBMITTALS

- A. Within 10 calendar days after the date of the Notice to Proceed, the Contractor shall submit a preliminary Schedule of Values for all of the Work to the Engineer for review:
 - 1. The Contractor's Schedule of Values will be acceptable to the Engineer as to form and substance if it provides a reasonable allocation of the Contract price to component parts of the Work.
 - 2. The Engineer may request and require additional detail or documentation to support the values published on the preliminary schedule of values. This additional documentation may consist of, but is not limited to, executed purchase orders, subcontracts, or other agreements.
 - 3. The Engineer may request and require an additional level of break down to the values published in the preliminary schedule of values.
 - 4. If the value published for any of the items in the preliminary schedule of values is in the opinion of the Engineer, inappropriate, it shall not be accepted.
 - 5. If, in the opinion of the Engineer, the preliminary schedule of values is unbalanced as to provide for overpayment on items of Work to be performed first, it shall not be accepted.

END OF SECTION 01295

SECTION 01300**SUBMITTALS**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section specifies the general methods and requirements of submissions applicable to the following Work-related submittals.
 - 1. Shop Drawings
 - 2. Product Data
 - 3. Samples
 - 4. Construction Photographs
 - 5. Construction or Submittal Schedules
 - 6. Certifications
- B. Detailed submittal requirements will be specified in the technical specifications section.

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

- A. Shop Drawings:
 - 1. Shop drawings, as defined in the General Conditions, and as specified in individual Work Sections include, but are not necessarily limited to:

Custom-prepared data such as fabrication and erection/installation (working) drawings of concrete reinforcement, structural details and piping layout, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications as applicable to the Work.
 - 2. All shop and Working drawings shall be prepared on standard size, 24-in. by 36-in. sheets, except those which are made by changing existing standard shop or Working drawings.
 - 3. All shop drawings shall be submitted using the transmittal form acceptable to the ENGINEER.
 - 4. All shop drawings submitted by subcontractor for approval shall be sent directly to the CONTRACTOR for checking. The CONTRACTOR shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
 - 5. The CONTRACTOR shall check all subcontractor's shop drawings regarding measurements, size of members, and details to satisfy himself that they conform to the intent of the Drawings and Specifications. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.

6. All details on shop drawings submitted for approval shall show clearly the relation of the various parts of the main members and lines of the structure, and where correct fabrication of the Work depends upon field measurements; such measurements shall be made and noted on the drawings before being submitted for approval.

B. Product Data:

1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and printed installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances including certificates of compliance and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications and recommended spare-parts listing, and printed product warranties, as applicable to the Work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. The CONTRACTOR shall review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
 1. Field measurements
 2. Field construction criteria
 3. Catalog numbers and similar data
 4. Conformance with the Specifications
- B. Each shop drawing, sample, and product data submitted by the CONTRACTOR shall have affixed to it the following "Certification Statement including the CONTRACTOR'S submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-in. X 17-in. and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the ENGINEER a copy of each submittal transmittal form for shop drawings, product data and samples at the time of submittal of said drawings, product data and samples to the ENGINEER.
- C. If a shop drawing shows any deviation from the requirements of the Contract Documents, the CONTRACTOR shall make specific mention of the deviations in the Transmittal Form furnished by the ENGINEER and provide a description of the deviations in a letter attached to the submittal.
- D. The review and approval of shop drawings, samples or product data by the ENGINEER shall not relieve the CONTRACTOR from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the CONTRACTOR and the ENGINEER will not have responsibility therefor.
- E. No portion of the Work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not

conform to approved shop drawings and data shall be at the CONTRACTOR'S risk. The OWNER will not be liable for any expense or delay due to corrections remedies required to accomplish conformity.

- F. Project Work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.
 - 1. Manufacturer's printed installation instructions, a part of product data submitted to the ENGINEER will not be reviewed and are for informational purposes only.

1.04 SUBMISSION REQUIREMENTS

- A. Make Submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the Work of any other CONTRACTOR.
- B. All submittals shall be submitted sufficiently in advance of construction requirements to provide no less than ten days, including Saturdays, Sundays and legal holidays for review from the time received at the ENGINEER'S reviewing office. For submittals of major equipment, that require more than ten days to review, due to its sheer complexity and amount of detail and also requiring review by more than one engineering discipline, a letter will be sent by the Project Manager or his/her designee to the CONTRACTOR informing him/her of the circumstances and the date it is expected the submittal will be returned to the CONTRACTOR.
- C. Number of submittals required:
 - 1. Shop Drawings: Unless otherwise stated in the respective Specifications Sections, submit four (4) copies.
 - 2. Product Data: Unless otherwise stated in the respective Specifications submit four (4) copies.
 - 3. Samples: Submit the number stated in the respective Specification Sections.
- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and number.
 - 3. CONTRACTOR identification.
 - 4. The names of:
 - a. CONTRACTOR
 - b. Supplier
 - c. Manufacturer
 - 5. Identification of the product, with the specification section number, page and paragraph(s).
 - 6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the Work or material
 8. Applicable standards, such as ASTM or Federal Specification numbers.
 9. Identification of deviations from Contract Documents.
 10. Identification of revisions on resubmittals.
 11. An 8-in. x 3-in. blank space for CONTRACTOR and ENGINEER stamps.
- E. Each shipment of drawings shall be accompanied by a transmittal form acceptable to the ENGINEER giving a list of the drawing numbers and the names mentioned above.
- 1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES
- A. The ENGINEER'S review is for general conformance with the design concept and Contract drawings. Markings or comments shall not be construed as relieving the CONTRACTOR from compliance with the Contract plans and specifications or from departures therefrom. The CONTRACTOR remains responsible for details and accuracy, for coordinating the Work with all other associated Work and trades, for selecting fabrication processes, for techniques of assembly, and for performing Work in a safe manner.
- B. The review of shop drawings, data, and samples will be general. They shall not be construed:
1. as permitting any departure from the Contract requirements;
 2. as relieving the CONTRACTOR of responsibility for any errors, including details, dimensions, and materials;
 3. as approving departures from details furnished by the ENGINEER, except as otherwise provided herein.
- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which the ENGINEER finds to be in the interest of the OWNER and to be so minor as not to involve a change in Contract Price or time for performance, the ENGINEER may return the reviewed drawings without noting an exception.
- D. Two (maximum) copies of shop drawings or product data will be returned to the CONTRACTOR via First Class United States Postal Service. Samples will not be returned.
- E. Submittals will be returned to the CONTRACTOR under one of the action codes indicated and defined on the transmittal form furnished by the ENGINEER.
- F. Resubmittals will be handled in the same manner as first submittals. On resubmittals the CONTRACTOR shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the ENGINEER, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the CONTRACTOR. The CONTRACTOR shall make corrections to any Work done because of this type revision that is not in accordance to the Contract Documents as may be required by the ENGINEER.

- G. Partial submittals may not be reviewed. The ENGINEER will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the CONTRACTOR, and will be considered “Rejected” until resubmitted. The ENGINEER may at his option provide a list or mark the submittal directing the CONTRACTOR to the areas that are incomplete.
- H. If the CONTRACTOR considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the CONTRACTOR shall give written notice thereof to the ENGINEER at least seven Working days prior to release for manufacture.
- I. When the shop drawings have been completed to the satisfaction of the ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.

1.06 DISTRIBUTION

- A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the ENGINEER. Number of copies shall be as directed by the ENGINEER but shall not exceed 6.

1.07 GENERAL PROCEDURES FOR SUBMITTALS

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related Work or other applicable activities, or within the time specified in the individual Work sections, of the Specifications, so that the installation will not be delayed by processing times including disapproval resubmittal (if required), coordination with other submittals, inspection, testing activities. No extension of time will be authorized because of the CONTRACTOR’S failure to transmit submittals sufficiently in advance of the Work.

1.08 CERTIFICATION FORMS

- A. If specified in other Sections of these Specifications, the CONTRACTOR shall submit the applicable certification form for each item required, and in the form attached to this Section, completely filled in and stamped.

1.09 CERTIFICATION OF COMPLIANCE

- A. Certificates of Compliance specified in the specifications shall include and mean certificates, manufacturer’s certificates, certifications, certified copies, letters of certification and certificate of materials.
- B. The CONTRACTOR shall be responsible for providing Certificates of Compliance requested and specified in the technical specifications. Certificates are required for demonstrating proof of compliance with specification requirements and shall be executed in 4 copies unless otherwise specified. Each certificate shall be signed by an official authorized to certify on behalf of the manufacturing company and shall contain the name and address of the Supplier, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Supplier from furnishing satisfactory material, if after tests are performed on selected samples, the material is found not to meet the specific requirements.

END OF SECTION

SECTION 01310**CONSTRUCTION PROGRESS SCHEDULES**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. CONTRACTOR shall prepare and submit to ENGINEER for review within 14 days after Notice to Proceed, a construction progress schedule.

1.02 FORM OF SCHEDULES

- A. Prepare schedules in form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each operation.
 - 2. Horizontal Time Scale: Identify first work day of each week.
 - 3. Scale and spacing to allow space for notations and future revisions.
- B. Format of Listings: Chronological order of start of each item of work.
- C. Identification of Listings: By major specification section numbers.

1.03 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show complete sequence of construction by activity.
 - 2. Show dates for beginning and completion of each major element of construction. Elements shall include all aspects of Work described in the Contract Documents, as shown on the Project Drawings, and as directed by the ENGINEER. Allowances shall be made for inclement weather.
 - 3. Show projected percentage of completion for each item as of first day of each month.

1.04 SCHEDULE REVISIONS

- A. Every 7 days CONTRACTOR shall revise construction schedule to reflect changes in progress of work.
- B. Indicate progress of each activity at date of submittal.
- C. Show changes occurring since previous submittal of schedule.
 - 1. Major changes in scope.
 - 2. Activities modified since previous submittal.
 - 3. Revised projections of progress and completion.

4. Other identifiable changes.

D. Provide a narrative report as needed to define:

1. Problem areas, anticipated delays, and impact on schedule.
2. Corrective action recommended and its effect.
3. Effect of changes on schedules of other CONTRACTORS.

1.05 SUBMITTAL REQUIREMENTS

A. For initial submittal of construction schedule and subsequent revisions thereof, furnish copies of schedule to ENGINEER.

END OF SECTION

SECTION 01400**QUALITY ASSURANCE**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This section covers Quality Assurance and Control requirements for this contract.
- B. The CONTRACTOR is responsible for controlling the quality of work, including Work of its subcontractors, and suppliers and for assuring the quality specified in the Technical Specification is achieved.

1.02 TESTING LABORATORY SERVICE

- A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the ENGINEER. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- B. Preliminary Testing Services: Unless otherwise specified, the CONTRACTOR shall be responsible for all testing laboratory services in connection with concrete materials and mix designs, the design of asphalt mixtures, gradation tests and Engineering data required for the ENGINEER'S review of materials and equipment proposed to be used in the Work. The CONTRACTOR shall obtain the ENGINEER'S acceptance of the testing laboratory before having services performed, and shall pay all costs for services.
- C. Quality Control Testing Services: Perform all quality control tests in the field or in the laboratory on concrete, asphalt mixtures, moisture-density (Proctor) and gradation tests on structural and embankment fills, and backfill materials, in-place field density tests on structural and embankment fills, and other materials and equipment, during and after their incorporation in the Work. Field sampling and testing shall be performed in the general manner indicated in the specifications, with minimum interference with construction operations. The ENGINEER shall determine the exact time and location of field sampling and testing, and may require such additional sampling and testing as necessary to determine that materials and equipment conform with data previously furnished by CONTRACTOR and with the Contract Documents.
- D. Arrangements for delivery of samples and test specimens to the testing laboratory will be made by the CONTRACTOR. The laboratory tests shall be performed within a reasonable time consistent with the specified standards. Furnish a written report of each test to the ENGINEER.
- E. CONTRACTOR shall furnish all sample materials and cooperate in the sampling and field testing activities, interrupting the Work when necessary. When sampling or testing activities are performed in the field, the CONTRACTOR shall furnish personnel and facilities to assist in the activities.

- F. The CONTRACTOR shall not retain any testing laboratory against which the OWNER or the ENGINEER have reasonable objection, and if at any time during the construction process the services become unacceptable to the OWNER, or the ENGINEER, either the OWNER or the ENGINEER may direct in writing that such services be terminated. The request must be supported with evidence of improper testing or unreasonable delay. If the ENGINEER determines that sufficient cause exists, the CONTRACTOR shall terminate the services and engage a different testing laboratory.
- G. Transmittal of Test Reports: Written reports of testing and engineering data furnished by the CONTRACTOR for the ENGINEER'S review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.
- H. The testing laboratory shall furnish four copies of a written report of each test performed by laboratory personnel in the field of laboratory to the CONTRACTOR. Distribution shall be two copies of each test report to the ENGINEER'S Representative, one copy to the OWNER, and one copy for the CONTRACTOR within three days after each test is completed.

1.03 QUALITY ASSURANCE

- A. Copies of applicable referenced standards are not included in the Contract Documents. Where copies of standards are needed by the CONTRACTOR for superintendence and quality control of the work, the CONTRACTOR shall obtain a copy or copies directly from the publication source and maintain at the jobsite, available to the CONTRACTOR'S personnel, subcontractors, and ENGINEER.
- B. Quality of Materials: Unless otherwise specified, all materials and equipment furnished for permanent installation in the Work shall conform to applicable standards and specifications and shall be new, unused, and free from defects and imperfections, when installed or otherwise incorporated in the Work. Material and equipment shall not be used by the CONTRACTOR for any purpose other than that intended or specified unless the ENGINEER authorizes such use.
- C. Where so specified, products or workmanship shall also conform to the additional performance requirements included within the Contract Documents to establish a higher or more stringent standard or quality than that required by the reference standard.

1.04 OFFSITE INSPECTION

- A. When the specifications require inspection of materials or equipment during the production, manufacturing, or fabricating process, or before shipment, such services shall be performed by an independent testing laboratory, or inspection organization acceptable to ENGINEER in conjunction with or by the ENGINEER.
- B. The CONTRACTOR shall give appropriate written notice to the ENGINEER not less than 30 days before offsite inspection services are required, and shall provide for the producer, manufacturer, or fabricator to furnish safe access and proper facilities and to cooperate with inspecting personnel in the performance of their duties.
- C. The inspection organization shall submit a written report to the CONTRACTOR who shall provide copies to the ENGINEER.

1.05 MATERIALS AND EQUIPMENT

- A. The CONTRACTOR shall maintain control over procurement sources to ensure that materials and equipment conform to specified requirements in the Contract Documents.
- B. The CONTRACTOR shall comply with manufacturer's printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and operation. Should circumstances occur where the contract documents are more stringent than the manufacturer's printed instructions, the CONTRACTOR shall comply with the specifications. In cases where the manufacturer's printed instructions are more stringent than the contract documents, the CONTRACTOR shall advise the ENGINEER of the disparity and conform to the manufacturer's printed instructions. In either case, the CONTRACTOR is to apply the more stringent specification or recommendation, unless approved otherwise by the ENGINEER.

1.06 SHOP AND FIELD TESTING

- A. The CONTRACTOR is also responsible for providing the shop and field testing specified in the technical specification sections.
- B. The CONTRACTOR and its Subcontractor shall perform inspections, tests, and other services as required by the Contract Documents.
- C. CONTRACTOR shall provide twenty one days notice to the ENGINEER so that the ENGINEER may witness CONTRACTOR and/or Subcontractors off site and on site tests. The ENGINEER'S witnessing of tests does not relieve the CONTRACTOR and/or Subcontractors of their obligation to comply with the requirements of the Contract Documents.

1.07 MANUFACTURER'S FIELD SERVICES

- A. When specified in the technical specifications sections, the CONTRACTOR shall arrange for and provide technical representation from manufacturer's of respective equipment, items or components. The manufacturer's representative shall be a factory trained service ENGINEER/technician with type and length of experience specified in the technical specifications.
- B. Services Furnished Under This Contract: An experienced, competent, and authorized factory trained service ENGINEER/technician representative of the manufacturer of each item of equipment for which field services are indicated in the specifications shall visit the site of the Work and inspect, operate, test, check, adjust if necessary, and approve the equipment installation. In each case, the manufacturer's service representative shall be present when the equipment is placed in operation. The manufacturer's service representative shall revisit the jobsite as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory to the ENGINEER.
- C. Manufacturers' warranties and guarantees furnished for materials used for the project, as well as instruction sheets and parts lists supplied with project materials, shall be delivered to the ENGINEER prior to acceptance of the project. Each warranty or guarantee so furnished shall indicate its commencement and expiration date.

1.08 CERTIFICATION FORMS AND CERTIFICATES

- A. The CONTRACTOR shall be responsible for submitting the certification forms and certificates in conformance with the requirements specified in Section 01300 – SUBMITTALS.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 QUALITY CONTROL

- A. Quality control is the responsibility of the CONTRACTOR, and the CONTRACTOR shall maintain control over construction and installation processes to assure compliance with specified requirements.
- B. Certifications for personnel, procedures, and equipment associated with special processes (e.g., welding, cable splicing, instrument calibration, surveying) shall be maintained in the CONTRACTOR'S field office, available for inspection by the ENGINEER. Copies will be made available to the ENGINEER upon request.
- C. Means and methods of construction and installation processes are the responsibility of the CONTRACTOR, and at no time is it the intent of the ENGINEER to supersede or void that responsibility.
- D. If materials requiring testing, inspection, or approval by the ENGINEER have been installed or incorporated by the CONTRACTOR in the Work without these quality control measures being priorly accomplished, payment for such incorporated or installed materials will not be made without receipt of the required documentation which shows that the material meets the requirements of the specifications, unless otherwise authorized by the ENGINEER. If the reports and certificates, or determination by the ENGINEER, show that the material installed or incorporated in the Work does not meet the requirements of the specification, such material shall be removed and replaced with material which does meet the requirements, at no additional cost or expense to the OWNER.

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall provide all temporary facilities for the proper completion of the work, as required and as specified.

1.02 SANITARY REGULATIONS

- A. The CONTRACTOR shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required.
- B. The CONTRACTOR shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the OWNER, or on adjacent property.

1.03 WATER SUPPLY

- A. The CONTRACTOR shall make arrangements and pay for all water necessary for completion of construction operations under this contract.

1.04 TEMPORARY HEAT

- A. If temporary heat is required for the protection of the Work, the CONTRACTOR shall provide and install suitable heating apparatus, shall provide adequate and proper fuel, and shall maintain heat as required.
- B. Temporary heating apparatus shall be installed and operated in such manner that finished work will not be damaged thereby. After the permanent heating system has been installed, tested, and made ready for operation, the CONTRACTOR may, at his own risk and expense, use it for providing heat for protection of the Work. He shall provide and pay for all fuel and care necessary, and, when the Work is ready for acceptance, he shall, at his own expense, put the system into first-class condition, even to the extent of replacing worn or damaged parts as directed.

1.05 ELECTRICAL ENERGY

- A. The CONTRACTOR shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. The CONTRACTOR shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. The CONTRACTOR shall provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

1.06 PRECAUTIONS DURING ADVERSE WEATHER

- A. During adverse weather and against the possibility thereof, the CONTRACTOR shall take all necessary precautions so that the Work may be secured in all respects. Required protection shall be provided by use of tarpaulins, framed shelters, or other suitable means.
- B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by suitable means which will result in a moist or a dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

1.07 TEMPORARY FENCING

- A. Where existing fencing must be removed, provide commercial grade chain link fence to prevent trespass by workmen and suppliers onto private property and the public from construction site.

END OF SECTION

SECTION 01600
CONTROL OF MATERIALS

PART 1 – GENERAL

1.01 APPROVAL OF MATERIALS

- A. Unless otherwise specified, only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the work without prior approval of the Engineer.
- B. All materials used in the Work shall meet the quality requirements described in the material section of the specifications unless the same are altered by specific notes shown on the plans, or in the proposal.
- C. As specified in Section 01300, the Contractor shall submit to the Engineer, data relating to materials and equipment he proposed to furnish for the work. Such data shall be in sufficient details to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications.
- D. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during the progress of the work, the Contractor shall submit additional samples or materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the Contractor's expense. Except as otherwise noted, the Owner will make arrangements for and pay for the tests.
- E. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of a claim against the Owner or the Engineer.
- F. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.
- G. The materials and equipment used on the work shall correspond to the approved samples or other data. No changes shall be made in the sources of supply, or the kinds of materials, or in the type of any item except upon written approval by the ENGINEER.

END OF SECTION

SECTION 01610**DELIVERY, STORAGE AND HANDLING**

PART 1 – GENERAL

1.01 GENERAL

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the Work. Specific requirements, if any, are specified with the related items.

1.02 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with manufacturer's instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the ENGINEER.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking protecting and installing.
- E. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the CONTRACTOR'S normal construction operation or those of subcontractors and other CONTRACTORS and will not interfere with the flow of necessary traffic.
- F. Provide necessary equipment and personnel to unload all items delivered to the site.
- G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e., OWNER, other contractors), perform inspection. Notify ENGINEER in writing of any problems.
- H. For any material that requires more than one month for delivery, the CONTRACTOR shall provide the ENGINEER with documentary proof that said material has been ordered in sufficient time to complete the Project as planned. Failure to produce such documentary proof may result in a denial of any claim for a time extension based on late delivery of such material.

1.03 STORAGE AND PROTECTION

- A. Store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Instruction shall be carefully followed. Arrange storage to permit access for inspection.
- B. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.

- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, shipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce breakage, cracking and spilling to a minimum.
- D. All mechanical and electrical equipment and instruments to corrosive damage by atmosphere is stored outdoors (even though covered by canvas) shall be stored in a weathertight building to prevent injury. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the ENGINEER. Building shall be provided with adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.
1. All equipment shall be stored fully lubricated with oil, grease and other lubricants unless otherwise instructed by the manufacturer.
 2. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding". Upon installation of the equipment, the CONTRACTOR shall start the equipment does not deteriorate from lack of use.
 3. Lubricants shall be changed upon completion of installation and as frequently as required thereafter during the period between installation and acceptance. New lubricants shall be put into the equipment at the time of acceptance.
 4. Prior to acceptance of the equipment, the CONTRACTOR shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested and accepted in a minimum time period. As such, the manufacturer will guaranty the equipment equally in both instances. If such a certification is not given, the equipment shall be judged to be defective. It shall be removed and replaced at the CONTRACTOR'S expense.

END OF SECTION

SECTION 01710**CLEANING UP****PART 1 – GENERAL****1.01 DESCRIPTION OF WORK**

- A. During its progress, the Work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible. In addition, street sweeping of any street within the project area where Work has been initiated shall be conducted at a minimum of once per week in order that the streets and associated catch basins, drains, gutter, swales, etc. are kept clear of debris. All debris collected as part of street sweeping shall be satisfactorily disposed of during the progress of the Work.
- B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, and structures because of Work done under this contract, or elsewhere during the course of the CONTRACTOR'S operations, such material or debris shall be entirely and immediately removed and satisfactorily disposed of during the progress of the Work, and the ditches, channels, drains, pipes, structures, and Work, etc., shall, upon completion of the Work, be left in a clean and neat condition.
- C. On or before the completion of the Work, the CONTRACTOR shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.
- D. Upon completion of the Work, the CONTRACTOR shall remove from the sites of the subsurface explorations all of his plant, machinery, tools, equipment, temporary work, and surplus materials; shall, unless otherwise directed or permitted in writing, remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.
- E. The CONTRACTOR shall thoroughly clean all materials and equipment installed by him and his subcontractors, and on completion of the Work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation. All light fixtures and lamps are to be cleaned.
- F. The CONTRACTOR shall restore or replace, when and as directed, any public or private property damaged by his Work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the CONTRACTOR shall do as required all necessary highway or driveway, walk, and landscaping Work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as Work progresses and shall not be left until the end of the contract period.

END OF SECTION

SECTION 01740**WARRANTIES AND BONDS****PART 1 – GENERAL****1.01 SCOPE OF WORK**

- A. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers' standard warranties on products and special warranties.

1.02 RELATED WORK

- A. Refer to Conditions of Contract for the general requirements relating to warranties and bonds.
- B. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual sections.
- C. Certifications and other commitments and agreements for continuing services to OWNER are specified elsewhere in the Contract Documents.

1.03 SUBMITTALS

- A. Submit written warranties and/or maintenance bond to the OWNER prior to the date fixed by the ENGINEER for Substantial Completion, as required in the Contract Documents. If the Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the OWNER.
- B. When a designated portion of the Work is completed and occupied or used by the OWNER by separate agreement with the CONTRACTOR during the construction period, submit properly executed warranties to the OWNER within fifteen days of completion of that designated portion of the Work.
- C. When a special warranty is required to be executed by the CONTRACTOR, or the CONTRACTOR and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the ENGINEER for approval prior to final execution.
- D. Refer to individual sections for specific content requirements, and particular requirements for submittal of special warranties.
- E. At Final Completion, compile two copies of each required warranty and bond properly executed by the CONTRACTOR, or by the CONTRACTOR, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

- F. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½” x 11” paper.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of the product or work item.
- H. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer, supplier, and manufacturer.
- I. Identify each binder on the front and the spine with the typed or printed title “WARRANTIES AND BONDS”, the Project title or name, and the name, address, and telephone numbers of the CONTRACTOR and equipment supplier.
- J. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.
- K. Schedule of Special Warranties
 - 1. As specified on the Contract Documents.

1.04 WARRANTY REQUIREMENT

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The CONTRACTOR is responsible for the cost of replacing or rebuilding defective Work regardless of whether the OWNER has benefited from use of the Work through a portion of its anticipated useful service life.
- D. OWNER’S Recourse: Written warranties made to the OWNER are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the OWNER can enforce such other duties, obligations, rights or remedies.
- E. Rejection of Warranties: The OWNER reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.

- F. The OWNER reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or as part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the CONTRACTOR of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the CONTRACTOR.

1.05 DEFINITION

- A. Standard Product Warranties are pre-printed written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the OWNER.
- B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the OWNER.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02018**VIBRATION MONITORING****PART 1 – GENERAL****1.01 DESCRIPTION**

- A. Furnish, install, maintain, monitor, and remove vibration monitoring equipment as specified vibration-inducing operations are utilized.
- B. Monitor noise levels originating from construction operations as specified, if required by the Engineer.
- C. Modify construction operation procedures if existing operation creates vibration, air blast overpressure, or noise exceeding specified amounts.
- D. Vibration monitoring for rock removal shall conform to the requirements of this specification section and the requirements of the Town of Branford and the State of Connecticut.

1.02 RELATED WORK

- A. Division 1: General Requirements
- B. Section 02140: Dewatering
- C. Section 02210: Earth Excavation, Backfill, Fill, and Grading
- D. Section 02211: Rock Excavation and Disposal

1.03 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400.
- B. Retain the services of an independent vibration consulting firm with the following in-house personnel to conduct the following vibration monitoring requirements:
 - 1. Preparation, signing and stamping of monitoring plans and daily reports, and overseeing monitoring and interpretation of monitoring equipment shall be performed by personnel with the following qualifications:
 - a. Be a Connecticut Registered Professional Engineer
 - b. Have a minimum of five (5) years of experience in the vibration consulting field
 - c. Have successfully completed at least five (5) projects with vibration –inducing operations, air blast overpressures, and noise levels equal to or more severe than those to be encountered.

2. Installation, monitoring and interpretation of monitoring equipment shall be performed by personnel with the following qualifications:
 - a. Have at least three (3) years of experience in the operation of monitoring equipment proposed for use and interpretation of records produced by such equipment.
 - b. Have installed, operated, monitored and interpreted equipment and records on at least three (3) projects with vibration-inducing operations, air blast overpressures, and noise levels equal to or more severe than those to be encountered.

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01300:
 1. Qualifications of the independent vibration consulting firm's Professional Engineer as specified in subparagraph 1.03B.1 including the names of the five (5) successful projects with names, current addresses, and telephone numbers of persons in charge of representing the owners or the owners at the time of monitored vibration-inducing operation, air blast overpressures, and noise levels.
 2. Qualifications of the vibration consulting firm's personnel to install, operate and interpret the monitoring equipment as specified in subparagraph 1.03B.2 including the name of the personnel and the names of the three (3) projects per person which they installed, operated, monitored, and interpreted monitoring equipment with names, current addresses and telephone numbers of persons in charge of representing the owners or the owners at the time of monitored vibration-inducing operations, air blast overpressures, and noise levels.
 3. Prior to commencement of rock removal or other vibration inducing operations, submit in writing the plan for monitoring operations and equipment to be used to assure compliance with the vibration, air blast overpressure, and noise limitation. As a minimum, this plan shall provide for the following:
 - a. Recommended vibration limiting methods to meet the specified peak partial velocity limitations and locations for taking measurements.
 - b. Manufacturer's brochures and written operation instructions for seismograph recording equipment intended to be used for each vibration occurrence.
 4. Daily reports, while removing rock or performing other vibration-inducing operations, detailing each source of vibration, location of monitoring, and the vibration records highlighting peak particle velocities. For blasting, include the air blast overpressure records as well as a plot of particle velocity versus scaled distance. All daily reports shall be stamped and signed by the Vibration Consulting Firm's Professional Engineer.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- A. Provide a low frequency sensitive three-component seismic recording instrument with wave paper trace, variable trigger level setting, peak particle velocity memory operation (in inches/second) and air blast overpressure and sound level readout capability.
- B. Manufacturers:
 - 1. Spregner, St. Louis, MO
 - 2. Slope Indicator Co., Seattle, WA
 - 3. D & L Equipment Corp., Spoffard, NH
 - 4. Or approved equal

PART 3 – EXECUTION

3.01 EXECUTION

- A. Furnish specified instrumentation to be installed, operated and interpreted by the vibration consulting firm's personnel, as specified below and indicated.
- B. Monitor vibrations and record the entire particle velocity wave train, not just peak velocities. Obtain accurate, legible seismometer records of monitored vibrations.
- C. Perform all rock removal and other vibration-inducing operations so that vibrations reaching adjacent structures and facilities are within specified limits.
- D. Monitor vibrations by measuring the peak particle velocity in the vicinity of work. Peak particle velocity is defined as a maximum of the three velocity components, measured in three mutually perpendicular directions at any point by an instrument and combining the results. The peak particle velocity as measured by the vibration consulting firm's personnel on or at the location as specified in the submitted vibration monitoring plan, for rock removal or other vibration-inducing operations, shall not exceed the 1.0 for building structures or 2.0 for utilities.
- E. When blasting is conducted in the vicinity of structures subject to damage, air blast overpressures resulting from the blasting shall not exceed 0.014 psi peak overpressure. Operate the instrument to make a permanent record for each blast. Take measurement at the location as specified in the submitted vibration monitoring plan.
- F. In the event any recordings indicate that vibration or air overpressure limits are being exceeded, immediately suspend all blasting and other vibration-inducing operations and submit a report to the Engineer. Revise operations to reduce vibrations and submit a copy of the revised procedure to the Engineer at no additional cost to the Owner.

- G. If evidence of displacement or damage to utilities, equipment, or structures is observed or reported, immediately notify the Engineer and discontinue operations creating the vibrations. Revise operation to reduce vibrations and submit a copy of the revised procedure to the Engineer.
- H Restore or replace utilities, equipment, or structures damaged by vibrations or air blast overpressures at no additional cost to the Owner.

END OF SECTION

SECTION 02100**SITE PREPARATION AND RESTORATION****PART 1 – GENERAL****1.01 DESCRIPTION**

- A. Furnish labor, material, tools and equipment to prepare and restore site as indicated and specified. This shall consist of the replacement, resetting, and/or restoring to existing conditions all items that are removed or damaged in any way by construction activities. Loaming, fertilizing, seeding, planting, and related Work shall be done in accordance with Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Latest Edition, unless otherwise specified. Clearing and grubbing operations are not included in the Work to be completed under this section.

1.02 RELATED WORK

- A. Section 01710: Cleaning Up
- B. Section 02210: Earth Excavation, Backfill, Fill and Grading
- C. Section 02568: Erosion and Sedimentation Controls

1.03 REFERENCES

- A. Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817, Section 9.44 “Top Soil”.
- B. Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817, Section 9.46 “Liming”.
- C. Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817, Section 9.49 “Furnishing, Planting and Mulching Trees, Shrubs, Vines, and Ground Cover Plants”.
- D. Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817, Section 9.50 “Turf Establishment”.
- E. Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817, Section 9.53 “Sodding”.
- F. 2002 Connecticut Guidelines for Soil Erosion and Sediment Control

1.04 QUALITY ASSURANCE

- A. All Work to be performed in accordance with the requirements specified in Section 02568 – Erosion and Sedimentation Controls.

- B. Repair or replace seeded areas, plants, shrubs, and trees which, in judgment of ENGINEER, have not survived or grown in a satisfactory manner, for a period of at least one year after acceptance, or to the Work warranty period specified in the Contract Documents, whichever time period is longer.
- C. All Work to be in accordance with applicable permits.

1.05 JOB CONDITIONS

- A. It is the intent of this specification that existing trees within the limits of the Work are not to be disturbed by construction operations and are to be protected, except where specified or required by the ENGINEER to be removed. Only trees tagged in the field by the OWNER or the ENGINEER should be removed.
- B. ENGINEER directs variations required in grading on the job.

1.06 DELIVERY

- A. Seed material will be inspected upon arrival at the site. Unacceptable material will be removed from the site and replaced at no additional cost.
- B. Soil conditioners and amendments will be delivered to the site in their original unopened containers bearing the manufacturer's guaranteed chemical analysis and name.

1.07 STORAGE

- A. Seeds not planted on the day of arrival at the site will be stored and protected. Outside storage locations will be continually shaded and protected from the wind.
- B. Soil conditioners and amendments will be kept in dry storage separated from contaminants.

1.08 SUBMITTALS

- A. Submit with seed, certificates concerning seed mixture, purity, germinating value, and crop year identification.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. All areas disturbed as a result of the Work shall be restored to a state that is like or better than the pre-project condition by the CONTRACTOR. All disturbed areas shall be restored by the CONTRACTOR to the satisfaction of the OWNER and the ENGINEER.
- B. All on and offsite areas used for storage, staging, or for field offices shall be restored to a state that is like or better than the pre-project condition by the CONTRACTOR. All areas shall be restored by the CONTRACTOR to the satisfaction of the OWNER and the ENGINEER, and in accordance to the terms of offsite construction easement/agreements obtained for the project Work, as applicable.

3.02 EXISTING TREES AND VEGETATION

- A. Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering of trees by stockpiling construction or excavated material within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary fences, barricades or guards as required to protect trees and vegetation to be left standing. Install snow fence to protect trees at locations shown on the Drawings and as required to restrict construction activities from areas of existing vegetation to be preserved.
- B. All damaged trees shall be either repaired or removed. If a tree is damaged, the CONTRACTOR must immediately contact the ENGINEER. The decision as to whether a damaged tree should be repaired or removed shall, at the request of the CONTRACTOR, be priorly determined by the ENGINEER, who may choose to consult with an arborist/professional. If the ENGINEER determines that the consult or services of an arborist/professional is warranted, then the CONTRACTOR shall be responsible for all costs incurred, and shall receive no additional compensation from the OWNER for such costs.
- C. All trees or vegetation damaged during the Work operations shall be replaced by the CONTRACTOR, and to the satisfaction of the OWNER and the ENGINEER, at no additional cost to the OWNER. The CONTRACTOR shall consult with the OWNER and the ENGINEER to determine suitable replacement tree and vegetation varieties and sizes, prior to their installation by the CONTRACTOR.

3.03 EXISTING STRUCTURES AND PROPERTY

- A. Remove existing mailboxes, posts, catch basin frames and grates, manhole frames and covers, etc. within construction path unless directed otherwise. Existing structures and items located outside of the Work area or outside of the road right-of-way that necessitate either temporary or permanent removal/relocation to complete the work operations shall not be removed or relocated without prior authorization of the OWNER or the ENGINEER. Private property located within the project area shall not be removed or relocated without prior authorization of the OWNER or ENGINEER.
- B. Store at site designated by OWNER, items in reusable conditions as determined by ENGINEER. All items not in reusable condition, as determined by the ENGINEER, or that are not to be replaced or relocated after the completion of Work, shall be removed and disposed of in an appropriate and lawful manner by the CONTRACTOR.
- C. Unless otherwise specified in the Contract Documents, items removed that are determined by the ENGINEER not to be in reusable condition shall be replaced by the OWNER, except for items otherwise addressed in the Specifications. Items removed that are determined by the ENGINEER to be reusable that are damaged by the CONTRACTOR during their removal or storage shall be replaced by the CONTRACTOR at no cost to the OWNER.
- D. After the completion of Work operations, or when otherwise determined appropriate by the ENGINEER, all items that were stored, and all items serving as replacements to items that were determined by the ENGINEER to not be in reusable condition, shall be restored to their pre-construction location, unless otherwise authorized by the ENGINEER, specified in the Contract Documents, or shown on the project Drawings.

3.04 GROUND SURFACE PREPARATION/RESTORATION

- A. Where required, ground surfaces within the project area shall be cleared and grubbed in accordance with Section 02230 Clearing and Grubbing.
- B. For Work in loamed areas, strip all loam to one side to avoid mixing with excavation materials. Where applicable, loam is to be stockpiled and surrounded by an erosion control barrier. If stockpile is not to be used within 30 days, it shall be seeded and mulched by the CONTRACTOR. Do not take loam from site, unless directed by the ENGINEER.
- C. All disturbed ground surfaces shall be graded, either in accordance to a grading plan prepared or approved by the ENGINEER, or at the direction of the ENGINEER, topsoiled, seeded, and mulched. Ground surface seed bed preparation shall be completed by the CONTRACTOR in accordance to the Erosion and Sedimentation Control Plan prepared by the ENGINEER, or if a plan has not been completed by the ENGINEER in accordance with the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control".

3.05 WORK IN IMPROVED PROPERTY

- A. Protect or dig up, trees, cultivated hedges, lawns, shrubs, and plants which might be damaged by Contractor's operations, and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and maintain until growth is reestablished. If, at the determination of the OWNER or ENGINEER, trees, cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, replace at no additional compensation, by items at least equal to that existing at start of Work. Trees which cannot be temporarily replanted and maintained are to be replaced with trees at least equal to that existing at start of Work. Guarantee survival of trees and shrubs for at least one year after restoration is complete or to the Work warranty period specified in the Contract Documents, whichever time period is longer. Loam and seed lawns damaged by CONTRACTOR'S operation, as specified.
- B. Do such hand Work as may be required to prevent damage to buildings or trees in all Work in approved property.

END OF SECTION

SECTION 02110

MOBILIZATION

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Under this Work the CONTRACTOR shall set up his necessary general plan, including shops, storage areas, office and such sanitary and other facilities as are required by local or state law or regulation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Such materials as are required for mobilization and that are not to be a part of the completed Contract shall be as determined by the CONTRACTOR except that they shall conform to any pertinent local or state law, regulation or code.

PART 3 - EXECUTION

3.01 CONSTRUCTION DETAILS

- A. The Work required to provide the above facilities and services for mobilization shall be done in a safe and workmanlike manner and shall conform with any pertinent local or state law, regulation or code. Good housekeeping consistent with safety shall be maintained.

END OF SECTION

SECTION 02120**MAINTENANCE AND PROTECTION OF TRAFFIC**

PART 1 - PART 1 – GENERAL

1.01 DESCRIPTION

- A. The CONTRACTOR shall maintain and protect traffic in the project area in accordance with the requirements and regulations of the Town and these specifications. Unless otherwise specified, the CONTRACTOR must maintain pedestrian and vehicular traffic to permit access to businesses, residences, and intersecting streets. It shall be the sole responsibility of the CONTRACTOR to forewarn the Town Local Regulatory Agencies (including but not limited to the Police and Fire Departments) at least 72 hours in advance of changes in traffic patterns due to reduction of pavement width or closing of street (streets shall not be closed without prior approval of the Town). The CONTRACTOR shall furnish, install, maintain, adjust and store all signs, suitable barricades, traffic barrels, and traffic cones, as necessary to carry out the traffic routing plan and maintain vehicular and pedestrian traffic. All of this work shall meet with the approval of the Town and the ENGINEER.
- B. Lane Closures:
1. Allowable periods for lane closures shall be in general from 9:00 a.m. until 4:00 p.m. daily. The Town, at their sole option, may modify the allowable period.
 2. The CONTRACTOR shall maintain access to all properties on an as needed basis.
 3. Excepted therefrom will be those periods, during the allowable periods, when the CONTRACTOR is actively working at which time the CONTRACTOR will be allowed to maintain and protect at least an alternating one-way traffic operation on a paved travel path no less than 12 feet in width.

1.02 SUBMITTALS

- A. **The CONTRACTOR shall submit to the ENGINEER and the Town for review and approval a “Traffic Routing Plan”. This plan shall include proposed signage patterns, layout of traffic cones, traffic barrels, barricades, etc., and proposed scheduling of certified traffic control personnel.**

1.03 REFERENCES

- A. All signs, barricades, flashing lights, traffic personnel, detours, etc., and all else necessary and incidental for the maintenance and protection of traffic shall conform to the “Manual on Uniform Traffic Control for Streets and Highways”, as approved and amended.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Construction traffic control devices such as traffic cones, barricades, drums, signage, flashers, etc., proposed on the traffic routing plan prepared by the CONTRACTOR shall meet the applicable guidelines published in Form 817, and the requirements specified herein.

PART 3 – EXECUTION

3.01 MATERIAL AND METHODS

A. Staged Construction

1. The CONTRACTOR shall maintain and protect traffic while construction is occurring. Traffic routing shall be as shown on the approved “Traffic Routing Plans” as prepared by the CONTRACTOR, reviewed by the ENGINEER and approved by the Town.

B. Residential Driveways

1. The CONTRACTOR shall maintain access to and egress from all residential driveways throughout the project limits.
2. If a temporary closure of a residential driveway is necessary, the CONTRACTOR shall coordinate with the property owner to determine the time period of the closure.

C. Signing

1. The CONTRACTOR shall maintain all existing signs throughout the project limits during the duration of the project.
2. The CONTRACTOR shall temporarily relocate existing signs and sign supports as many times as deemed necessary and install temporary sign supports and foundations if necessary and as directed by the ENGINEER.

3. Construction Signs and Barricades

- a. Signs: Properly lighted, adequately sized clear, concise, legible signs shall be furnished as necessary for the safe regulation of traffic.
- b. Barricades: Suitable lighted barriers or barricades shall be furnished by the CONTRACTOR and put up and maintained at all times during the night or daytime, around all open ditches, trenches, excavations, or other work potentially dangerous to pedestrians and traffic. Barricades shall be placed on all sides and throughout the entire length of all open ditches, trenches, excavations, or other work which must be bared to the general public. Barricades shall be properly painted in order to retain a high degree of visibility to vehicular and pedestrian traffic.
- c. Flashers: barricades shall be lit by flashers in accordance with this paragraph or other lighting methods approved by the ENGINEER in lieu thereof. Flashers shall be placed along the entire length of the barricades at an interval no greater than 8 feet, center to center. Flashers shall be power operated, lens directed, enclosed light units which shall provide intermittent light from 70 to 120 flashes per minute, with the period of light emittance occurring not less than 25 percent of each on-off cycle, regardless of temperature.

The emitted light shall be yellow in color and the area of light on at least one face of the unit shall be not less than 12 square inches. The discernable light shall be bright enough to be conspicuously visible during the hours of darkness at a minimum distance of 800 feet from the unit under normal atmospheric conditions. For units which beam light in one or

more directions the foregoing specifications shall apply 10 degrees or more to the side and 5 degrees or more above and below the photometric axis.

CONTRACTOR shall furnish and securely fasten flashing unit to signs, barricades, and other objects in such numbers and for such lengths of time as are required for the maintenance and protection of traffic. The flasher shall be in operation during all hours between sunset and sunrise, and during periods of low visibility. The CONTRACTOR shall maintain, relocate and operate barricades and flashers throughout the life of the Contract.

- d. **Signing Patterns:** The CONTRACTOR shall erect and maintain all signing patterns in accordance with the traffic control plans submitted and approved by the OWNER and ENGINEER. Proper distances between advance warning signs and proper taper lengths are mandatory.
4. When all Work is completed, the CONTRACTOR shall remove and/or reset existing signs and install new signs as detailed in the Project Drawings.
- D. **Traffic Signals**
1. The CONTRACTOR shall keep each traffic signal in the project limits operational at all times during construction.
- E. **Access**
1. The CONTRACTOR shall arrange his operations to maintain access to properties along the street including temporary bridges to driveways, and to fire hydrants, manholes, gate boxes, or other utilities. Whenever any trench obstructs traffic in or to any public way, private driveway, or property entrance, the CONTRACTOR shall take such steps as required to maintain necessary traffic and access including temporary bridging if required. The CONTRACTOR shall confine his occupancy of public or traveled ways to the smallest space compatible with the efficient and safe performance of the Work.
- F. The CONTRACTOR shall observe and obey all local and state laws, ordinances, regulations and permits in relation to the obstruction of streets and highways, keeping passageways open and protecting traffic where there may be danger from blasting or other construction activities.
- G. If the CONTRACTOR'S operations shall interfere with the removal or sanding of snow or ice by the public authorities or adjoining land owners, in an ordinary manner with regular highway equipment, the CONTRACTOR shall be required to perform such services for the public authorities or adjoining owners without charge. If the CONTRACTOR fails to do so, he shall reimburse the said authorities or adjoining owners or the Town for any additional, cost to them for doing such work occasioned by conditions arising from the CONTRACTOR'S operations, occupancy, or trench surfaces, together with any damage to the equipment of the said parties by those conditions, or claims of any parties for damage or injury of loss by reason of failure to remove snow or ice or to sand icy spots under these conditions.
- H. **Detours**
1. If a detour is deemed necessary, a proposed detour plan will be submitted to the ENGINEER and the applicable Town Agencies.

I. Non-Performance

1. Should the CONTRACTOR or his employees neglect to set out and maintain barricades or lights, as required in these Specifications, the ENGINEER immediately, and without notice, may furnish, install and maintain barricade or lights. The cost thereof shall be borne by the CONTRACTOR and may be deducted from any amount due or to become due to the CONTRACTOR under this contract.
2. The CONTRACTOR will be held responsible for any damages that the Town, ENGINEER, Governmental units, or their heirs or assigns may have to pay as a consequence of the CONTRACTOR'S failure to protect the public from injury, and the same may be deducted from any payments that are due or may become due to the CONTRACTOR under this contract.

J. Trafficmen

1. The CONTRACTOR shall be responsible for providing well-trained, qualified and adequately equipped personnel for the direction of traffic and for the adequate protection of the traveling public at such locations and for such time as necessary or as ordered by the ENGINEER. The CONTRACTOR, as his option, may select to utilize the services of off-duty Town Police personnel as traffic men during the course of construction, the cost of which shall be included in the Lump Sum.
2. The CONTRACTOR shall be responsible for the scheduling of the Off-duty Police Officers, and for any charges incurred through his failure to appropriately notify the Officers of cancellation in a timely manner.

- K. All signs, barricades, flashing lights, traffic personnel, detours, etc., and all else necessary and incidental shall conform to the "Manual on Uniform Traffic Control For Streets and Highways" as approved and amended.

END OF SECTION

SECTION 02140**DEWATERING****PART 1 – GENERAL****1.01 DESCRIPTION**

- A. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and permit work to be performed under dry and stable conditions. Work to be done as part of dewatering includes, but is not limited to:
 - 1. Lower the groundwater level
 - 2. Lower hydrostatic pressure
 - 3. Prevent surface water from entering the excavation during construction
 - 4. Implement erosion control measures for disposing of discharge water
- B. Groundwater within the excavation area shall be lowered to at least 2 feet below the lowest excavation levels as specified and as indicated.
- C. Common dewatering methods include, but are not limited to, sump pumping, deep wells, well points, vacuum well points or any combination thereof.
- D. The Contractor shall obtain the required permits for discharge from the Contractor's dewatering systems in accordance with 40 CFR part 122.61 FR 10 813. The discharge location shall be in accordance with permit requirements.

1.02 RELATED WORK

- A. Division 1: General Requirements
- B. Section 02568: Erosion Control Sedimentation and Containment of Construction Materials
- C. Section 02210: Earth Excavation, Backfill, Fill, and Grading
- D. Section 02224: Compacted Gravel
- E. Section 02435: Crushed Stone

1.03 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS:
 - 1. Qualifications of the Contractor's dewatering specialist's or firm's qualifications a minimum of two (2) weeks prior to execution of any dewatering. The submittal shall include, but not be limited to:

- a. Qualifications of specialist's firm or firm's Registered Professional Engineer as specified in paragraph 1.04 B.
 - b. Qualifications of specialist's or firm's field representative, as specified in paragraph 1.04 B, who shall oversee the installation, operation and maintenance of the dewatering system.
2. Submit a dewatering plan at least two weeks prior to start of any dewatering operation. Do not submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
- a. Dewatering plan and details stamped and signed by a Connecticut Registered Professional Engineer,
 - b. Certificate of Design: Refer to Section 01300,
 - c. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment,
 - d. Detailed description of dewatering, maintenance, and system removal procedures,
 - e. Monitoring plan and details, including, but not limited to, locations of observation well, and geotechnical instruments such as settlement markers (reference points on structures) and piezometers, and frequency of reading the monitoring devices,
 - f. Erosion/sedimentation control measures, and methods of disposal of pumped air,
 - g. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms, and
 - h. Procedures for making borings, taking and classifying samples and installing observation wells.
3. Measurement records consisting of observation well groundwater records and the geotechnical instrumentation readings within one day of monitoring.
4. A modified dewatering plan within 24 hours, if open pumps from sumps and ditches results in boils, loss of fines or softening of the ground.
5. Boring logs and installation records of observation wells.

1.04 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 and as specified.
- B. Employ the services of a dewatering specialist or firm having the following qualifications:
 1. Have completed at least five (5) successful dewatering projects of equal size and complexity and with equal systems within the last five (5) years.

2. Retain the services of a Professional Engineer registered in Connecticut having a minimum of five (5) years experience in the design of well points, deep wells, recharge systems, or equal systems.
 3. Retain the services of a field representative having a minimum of 5 years experience in installation of well points, deep wells, recharge systems, or equal systems.
- C. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Engineer, stabilize the subgrade, and modify system to perform as specified at no additional cost to the Owner.
- D. Notify the Engineer immediately if any settlement or movement is detected on structures. Take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within **24 hours**. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.
- E. If oil and/or other hazardous materials are encountered after dewatering begins, immediate notify the Engineer.
- 1.05 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01610 and as specified.

1.06 PROJECT / SITE CONDITIONS

- A. Subsurface Conditions: Refer to Project Plans.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Provide observation wells in accordance with the Contractor's Dewatering Plan.
- B. Provide settlement markers, piezometers and/or any other geotechnical instruments in accordance with the submitted dewatering plan or as specified.
- C. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.
- D. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.
- E. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- F. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every five (5) used.
- G. Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.

- H. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
- I. Provide cement grout having a water cement ratio of 1 to 1 by volume.

PART 3 – EXECUTION

3.01 EXECUTION

- A. Execution of any earth excavation, installing temporary excavation systems, and dewatering shall not commence until the requirements for the appropriate submittals have been satisfied.
- B. Furnish, install and maintain dewatering system in accordance with the dewatering plan.
- C. Carry out dewatering program in such a manner as to prevent undermining or disturbing foundations of existing structures or of work ongoing or previously completed.
- D. Do not excavate until the dewatering system is operational.
- E. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.
- F. Discontinue open pumping from sumps and ditches, if such pumping is resulting in boils, loss of fines, softening of the ground, or instability of the slopes. Modify dewatering plan and submit to the Engineer at no additional cost to the Owner.
- G. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 02210 at no additional cost to the Owner.
- H. Dewatering Discharge:
 - 1. Install and monitor recharge systems when specified and/or indicated and in accordance with the submitted dewatering plan.
 - 2. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
 - 3. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property. Provide sedimentation controls in accordance with Sections 02568 of these specifications.
 - 4. Provide separately controllable pumping lines.
 - 5. The Engineer reserves the right to sample discharge water at any time.
 - 6. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- I. Monitoring Devices and Records:

1. Install, maintain, monitor and take readings from the observation wells and geotechnical instruments in accordance with the dewatering plan.
 2. Install settlement markers on structures within a distance equal to twice the depth of the excavation, from the closest edge of the excavation. Conduct and report settlement surveys to 0.01 ft.
- J. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.
- K. Removal:
1. Provide the Engineer with a minimum of 2 business days of notice prior to discontinuing dewatering operation.
 2. Backfill and compact sumps or ditches with gravel or crushed stone wrapped with geotextile fabric in accordance with Section 02210.
 3. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

END OF SECTION

SECTION 02210**EARTH EXCAVATION, BACKFILL, FILL AND GRADING**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Perform the following earth excavation, backfill, fill and grading as indicated or specified:
1. Excavating all types of materials to limits indicated or required, including soil, boulders, bedrock, utilities, foundations, pavements, debris, or any other materials to accommodate piping, conduits, foundations and other structures
 2. Provide materials for backfilling excavations and constructing embankments and fills as indicated and specified
 3. Construct embankments of compacted materials
 4. Grade surfaces to meet finished grades indicated and provide for positive drainage of all surfaces.
 5. Immediately notify the ENGINEER if suspected hazardous materials are encountered and cease operations in that part of Work.
 6. Remove boulders within the excavation limits.
 7. Remove from the site and legally dispose of excess materials and materials that are not suitable for re-use.
 8. Conducting all Work in accordance with OSHA requirements and other applicable laws and regulations, and with the requirements of all federal, state, and land agencies and authorities having jurisdiction over the Work.

1.02 RELATED WORK

- A. Section 02224: Compacted Gravel
- B. Section 02225: Processed Aggregate Base
- C. Section 02435: Crushed Stone
- D. Section 02500: Bituminous Concrete Pavement

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM) Publications:

1. C33: Specification for Concrete Aggregates
2. C136: Sieve Analysis of Fine and Coarse Aggregates
3. D421: Practice for Dry Preparation of Soil Samples for particle Size Analysis and Determination of Soil Constants
4. D422: Test Method for Particle-Size Analysis of Soils
5. D1140: Test Method of Amount of Material in Soils Finer than the No. 200 Sieve
6. D1556: Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method
7. D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft³)
8. D2167: Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
9. D2922: Test method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
10. D3017: Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depths)
11. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils
12. D4718: Practice for Correction of Unit Weight and Water Content for Soils Containing Oversized Particles
13. D4832-02: Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
14. D4944: Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Pressure Tester Method
15. D4959: Test Method for Field Determination of Water (Moisture) Content of Soil by Direct Heating Method
16. D5080: Test Method for Rapid Determination of Percent Compaction

B. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29: Subpart P – Excavations, Trenching and Shoring

1.04 DEFINITIONS

- A. Percentage of compaction is defined as the ratio of the field dry density, as determined by ASTM D1556 to the maximum dry density determined by ASTM D1557 Procedure C, multiplied by 100.
- B. Proof Roll: Compaction with a minimum of 4 passes of a vibratory steel drum or rubber tire roller. Vibratory plate compactors shall be used in small areas where vibratory steel drum or rubber tire roller can not be used.
- C. Acceptable Material: Material that does not contain organic silt or organic clay, peat, vegetation, wood or roots, stones or rock fragments over 6 inches in diameter, porous biodegradable matter, loose or soft fill, excavated pavement, construction debris, or refuse. Stones or rock fragments shall not exceed 40 percent by weight of the backfill material.
- D. Unacceptable Materials: Materials that do not comply with the requirements for the acceptable materials or that cannot be compacted to the specified or indicated density.

1.05 SUBMITTALS

- A. Submit the following in accordance with Section 01300.
 - 1. Qualifications of the CONTRACTOR'S Independent Testing Laboratory as specified in Paragraph 1.06 E, two (2) weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.
 - 2. Submit an excavation, backfilling, and filling plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the OWNER and third parties for an overall understanding of the Project relating to access, maintenance of existing facilities and proper utilization of the site. The CONTRACTOR shall remain responsible for the adequacy and safety of the means, methods, and sequencing of construction. The plan shall include, but not limited to the following items:
 - a. Detailed sequence of Work
 - b. General description of construction methods
 - c. Numbers, types, and sizes of equipment proposed to perform excavation and compaction
 - d. Details of dust control measures
 - e. Proposed locations of stockpiled excavation and/or backfill materials
 - f. Proposed surplus excavated material off-site disposal areas and required permits
 - g. Details of erosion and sedimentation control measures that will prevent erosion and sedimentation during the earth moving activities.

3. The following material submittals shall be submitted to the ENGINEER prior to backfilling and filling:
 - a. Compacted Gravel: As specified in Section 02224
 - b. Processed Aggregate Base: As specified in Section 02225.
 - c. Crushed Stone: As specified in Section 02435
 - d. Controlled Low Strength Material: Mix Design and Statement of Compliance (Where applicable)
 - e. Other Acceptable Materials: Laboratory testing results of gradation and moisture-density relationship. Submittal shall include specific location of the source and the date when sample was taken.
4. During construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the ENGINEER before placing the next lift or construction foundations.

1.06 QUALITY ASSURANCE AND CONTROL

- A. Excavations shall be performed in the dry, and kept free from water, snow and ice during construction. Bedding and backfill material shall not be placed in water. Water shall not be allowed to rise upon or flow over the bedding and backfill material.
- B. The CONTRACTOR shall be solely responsible for making all excavations in a safe manner. All excavations, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- C. Do not excavate, construct embankments, or fill until the ENGINEER has reviewed all the required submittals.
- D. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines, and embankments or existing structures and pipelines.
- E. Employ an independent testing laboratory to perform particle size and gradation analyses in accordance with ASTM D422, and to determine compactibility in accordance with ASTM D1557 or all the proposed backfill and fill materials, and monitoring field compaction operations. The independent testing laboratory shall have the following qualifications:
 1. Be accredited by the American Association of State Highway and Transportation Officials (AASHTO) Accreditation Program
 2. Have three (3) years experience in sampling, testing and analysis of soil and aggregates, and monitoring field compaction operations.
 3. Able to provide references from previous Work.

F. Field Testing and Inspections:

1. By CONTRACTOR'S independent testing laboratory, acceptable to the ENGINEER, at CONTRACTOR'S expense as specified in Paragraph 1.06 E.
2. Location of tests mutually acceptable to testing laboratory and the ENGINEER or as directed by the ENGINEER.
3. In the event compacted material does not meet specified in-place density, recompact material and retest this area until specified results are obtained at no additional cost to the OWNER.

G. Methods of Field Testing:

1. In-Place Density: ASTM D1556, ASTM D2167, or ASTM D2922
2. In-Place Moisture Content: ASTM D3017, ASTM D4944, or ASTM D4959

H. Material Testing Frequency: The following testing frequencies are minimums required for all structural and non-structural fill, grading, and embankment.

1. Field In-Place Density and Moisture Content: Compacted gravel and crushed stone shall be compacted as specified and indicated. For other backfill and fill material minimum test frequency shall be as follows, and no less than one test per:
 - a. Trenches under structures foundation preparation or roadways subbase: Every 100 linear ft. per lift
 - b. Trenches in areas without structures or roadways: Every 200 linear ft. per lift
 - c. Paved Roadways: Every 50 linear ft. per lift
 - d. Paved Areas: 1,500 sq. ft. per lift
 - e. Under Structure: 200 sq. ft. per lift
 - f. Around Structures: 1,500 sq. ft. per lift
 - g. Embankment Fills: 5,000 sq. ft. per lift
2. Moisture-Density – One per source except for compacted gravel and crushed stone. Repeat the moisture density test for every 5,000 cubic yards of material used, and whenever visual inspection indicates a change in material gradation as determined by the ENGINEER.
3. Gradation Analysis – A minimum of one per source and for each moisture density test and whenever visual inspection indicates a change in material gradation.

- I. Construction Tolerances:
 - 1. Construct finished surfaces to plus or minus 1 inch of the elevations indicated.
 - 2. Grade cut and fill areas to plus or minus 0.20 foot of the grades indicated.
 - 3. Complete embankment edges to plus or minus 6 inches of the slope lines indicated.
 - 4. Provide the ENGINEER with adequate survey information to verify compliance with above tolerances.
- J. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
- J. Pipes, drains, and other utilities may exist in certain locations not indicated on Drawings. No attempt has been made to show all services. Completeness or accuracy of information given is not guaranteed.
- L. Dig test pits, as required, at no additional compensation.
- M. Carefully support and protect from damage, existing pipes, poles, wires, fences, curbs, property line markers, and other structures, which the ENGINEER determines must be preserved in place without being temporarily or permanently relocated. Should such items be damaged, restore without compensation therefor, to at least as good conditions as that in which they were found immediately before the Work was begun.
- N. Whenever certain existing structures as described below are encountered, and the ENGINEER so directs, change the location, remove and later restore, or replace such structures, or assist the OWNER in doing so; such Work to be paid for under applicable items of Work, otherwise as Extra Work.
- O. In removing existing pipes or other structures, include for payment only those new materials that are necessary to replace those unavoidably damaged as determined by the ENGINEER.
- P. The preceding two paragraphs apply to pipes, wires, and other structures which meet the following: (a) are not indicated on the Drawings or otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the ENGINEER, will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.
- Q. Restore existing property or structures as promptly as practicable.
- R. If material unacceptable for foundation (in the opinion of the ENGINEER) is found at or below the grade to which excavation would normally be carried in accordance with the Drawings and/or Specifications, remove such material to the required width and depth as directed by the ENGINEER and replace it with crushed stone fill.
- S. Haul away and dispose of surplus excavated materials at no additional cost to the OWNER.

- T. During progress of Work, conduct earth moving operations and maintain Work site so as to minimize the creation and dispersion of dust. Furnish and spread calcium chloride if the ENGINEER decides that it is necessary for more effective dust control.
- U. Provide suitable and safe bridges and other crossings where required for accommodations of travel, and to provide access to private property during construction, and remove said structures thereafter.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Use only acceptable materials from excavations or borrows.
- B. Provide geotextile fabric as indicated, meeting the requirements of this Section, when applicable.
- C. Use only products specified in the Project Drawings and Contract Documents, unless otherwise authorized by the ENGINEER.

2.02 USE OF MATERIALS

- A. Unless otherwise specified in the Project Drawings, Specifications, or directed by the ENGINEER, the following material uses shall apply:
 - 1. Common Fill: Use to backfill or raise general site grades outside the building and other structures; beneath sidewalk and pavement base course; in landscaped areas. On-Site materials, which meet the requirements of these Specifications, may be used as Common Fill with the ENGINEER'S approval. On-site materials may be used as Common Fill within the building below the slab base course layer and outside the Zone of Influence of foundations with the ENGINEER'S approval.
 - 2. Compacted Gravel: Use below footings, floor slabs, or other structural elements; for backfill against building/retaining walls; to replace unsuitable materials; and as shown on the Drawings. Compacted Gravel is also acceptable to raise general site grades and backfill trenches. On-Site materials, which meet the requirements of these Specifications, may be used as Compacted Gravel. Material shall meet the requirements of Section 02224.
 - 3. Crushed Stone: Use for drainage applications (e.g., below pools, subdrainage); below footings, slabs, and other structures as a "cushion" layer above bedrock; and as show on the Drawings. A Geotextile is required in conjunction with Crushed Stone to separate crushed stone from other soil materials. Material shall meet the requirements of Section 02435.

4. Non-woven Geotextile: for use in underdrain and separation applications shall be non-rotting, acid and alkali resistant, unsusceptible to sunlight damage, non-woven, fabric with the following properties:

Physical Property	ASTM Test Method	Units	Requirements
Grab Tensile Strength	ASTM D4632	lbs.	200
Grab Tensile Elongation	ASTM D4632	%	50
Mullen Burst	ASTM D3786	psi	380
Puncture	ASTM D4833	lbs.	130
Trapezoid Tear	ASTM D4533	lbs.	80
UV Resistance	ASTM D4355	% @ __hrs.	70/500
Apparent Opening Size (AOS)	ASTM D4751	US Sieve	80
Permittivity	ASTM D4491	sec. -1	1.2
Flow Rate	ASTM D4491	Gal/min/ft ²	95

5. Processed Aggregate Base: Use below pavements and as shown on Drawings. Material shall meet the requirements of Section 02225.
6. Sand: Use as shown on the Drawings.
7. Bedding Material: Use for utility bedding unless specified otherwise.

2.03 CONTROLLED LOW STRENGTH MATERIAL (CLSM OR FLOWABLE FILL)

- A. Description: Control Low Strength material (CLSM) is a self-consolidating, rigid setting material to be used in backfills, fills, structural fills and elsewhere as indicated on the plans, or as directed by the ENGINEER. The flow and set time characteristics of CLSM shall be designed to meet the specific job conditions. All CLSM material covered by this specification shall be designed to be hand excavatable at any time after placement. It shall be composed of a mixture of Portland cement, aggregate, and water with the option of using fly ash, air-entraining agents, and other approved admixtures.
- B. Materials: All materials utilized in the CLSM mix design shall be in accordance with the applicable requirements of Article M.03.01 of the Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, and the physical properties of Article M.01.20 of Standard Specifications Form 817.
- C. Composition:
 1. The composition of the CLSM shall be in accordance with the requirements set forth I Article M.03.01-General Composition of Concrete Mixes, of the Connecticut Department of Transportation Standard Specification, as well as the applicable sections of ACI 229R. The CONTRACTOR shall submit each proposed mix design, with all supporting data, to the ENGINEER for review and approval at least two weeks prior to its use.
 2. The setting time of CLSM materials shall be designed so as to achieve the strength necessary to comply with the time constraints called for under the Maintenance and protection of Traffic requirements of the Project Specifications. The use of chloride accelerators is not permitted.

3. The minimum compressive strength of the CLSM material shall be 30 pounds per square inch (psi) and the maximum compressive strength of the CLSM shall be 150 pounds per square inch (psi) when tested in accordance the ATSM D4832 after 56 days.
4. The CLSM mix design shall utilize a nominal maximum size of No. 8 aggregate as specified in M.01.01 of the Connecticut Department of Transportation Standard Specifications.
5. CLSM mixes that are designed with high entrained air shall have a minimum of 25% entrained air when tested in accordance with AASHTO T152.

2.04 TOP SOIL

- A. Top Soil shall be obtained from processed and conditioned site excavations or off-site borrow sources and shall be fertile, friable, natural loam and surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stone larger than 1” in any dimension, and other extraneous or toxic matter harmful to plant growth that satisfies the following criteria:

PH - 5.3 - 6
 No stones greater than 1”
 Less than 2% gravel greater than ½” to 1”
 Less than 3% gravel ¼ to 1”
 Less than 5% gravel 1/8” to 1”
 80 - 90% sand
 5 - 10% silt
 2.0% - 5.0% organic Matter
 Less than 2% clay

It is anticipated that generated topsoil will satisfy these criteria.

2.05 COMMON FILL

Sieve (ASTM D422)	Percent Finer by Weight
10-inch **	100
No. 4	20-90
No. 40	10-80
No. 200	0-30

“**” when used in trenches within 2 feet of utilities, or within 2 feet of foundation walls the largest particle dimension shall be 3 inches. The size of the largest particle shall be less then 2/3 of the lift thickness.

2.06 BEDDING MATERIAL

- A. Sand or sandy soil free of debris, waste, frozen materials and organics with 100 percent passing a 3/8 inch sieve and not more than 10 percent passing a no. 200 sieve.

2.07 SAND

- A. ASTM C 33; fine aggregate, natural or manufactured sand.

2.08 EQUIPMENT

- A. The compaction equipment shall be selected by the CONTRACTOR, and shall be capable of consistently achieving the specified compaction requirements. The selected compaction equipment shall meet the following minimum requirements:
 - 1. Manually operated vibratory plate compactors weighing no less than 200 pounds with vibration frequency no less than 1,600 cycles per minute.
 - 2. Vibratory steel drum or rubber tire roller weighing at least 12,000 pounds.

PART 3 – EXECUTION

3.01 SITE MAINTENANCE

- A. Roadway and sidewalks: Grade roadway to maintain it in a level unrutted condition and to eliminate puddling of surface water.

3.02 EXCAVATION

- A. Execution of any earth excavation shall not commence until the requirements of related dewatering, excavation support systems, and backfill and fill materials submittals have been satisfied.
- B. Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures of or Work previously completed under this contract.
- C. Excavate to widths that give suitable room for building structures or laying and jointing piping.
- D. Do not plow, scrape, or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- E. Excavate to lines and grades indicated in an orderly and continuous program.
- F. Establish limits of excavation to allow adequate Working space for installing forms and for safety of personnel.
- G. Excavate to elevations indicated, or deeper, as directed by the ENGINEER, to remove unacceptable bottom material.
- H. Exercise care to preserve material below and beyond the lines of excavations.
- I. Place excavated material at the approved stockpile locations and in no case closer than 3 feet from edge of excavations to prevent cave-ins of bank slides.

- J. Boulders, rock fragments, and concrete encountered during excavation less than 1.0 cubic yards in volume shall be considered as a normal part of in-place soils and not included for payment as rock.

3.03 SEPARATION OF EXCAVATED MATERIALS FOR REUSE

- A. Remove only existing pavement that is necessary for prosecution of Work.
- B. Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- C. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.

3.04 TRENCH EXCAVATION

- A. When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- B. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.

3.05 DEPTH OF TRENCH

- A. Excavate trenches to depths so as to permit pipe to be laid at elevations, slopes, or depths of cover indicated on Drawings, and at uniform slopes between indicated elevations.

3.06 WIDTH OF TRENCH

- A. Make pipe trenches as narrow as practicable and do not widen by scraping or loosening materials from the sides. Make every effort to maintain sides of trenches form and undisturbed until backfilling has been placed and compacted.
- B. Excavate trenches with approximately vertical sides between spring line of pipe and elevation 1 foot above top of pipe.

3.07 TRENCH EXCAVATION IN FILL

- A. Place and compact material to top of fill or to a minimum height of 1 foot above top of pipe, whichever is less, when pipe is to be laid in embankment or other recently filled material. Take particular care to ensure maximum consolidation of material under pipe location. Excavate pipe trench as though in undisturbed material.

3.08 EXCAVATION NEAR EXISTING STRUCTURES

- A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in Work to be done when incidental to normal excavation and under items involving normal excavation.
- B. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing Work properly.

3.09 REMOVAL OF SUBSURFACE OBSTRUCTIONS

- A. Remove indicated subsurface structures and related obstructions to extent shown.
- B. Promptly notify the ENGINEER when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls and foundations.

3.10 UNAUTHORIZED EXCAVATION

- A. When the bottom of any excavation for structures is taken out beyond limits indicated or specified, backfill with crushed stone wrapped with non-woven geotextile fabric or with 1,500 psi concrete.

3.11 REUSE AND DISPOSAL OF SURPLUS EXCAVATED MATERIALS

- A. Reuse surplus acceptable excavated materials for backfill; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose of off-site; all as directed or permitted and without additional compensation.

3.12 SUBGRADE PREPARATION AND PROTECTION

- A. Remove loam and topsoil, loose vegetable matter, stumps, and large roots from areas upon which embankments will be built or material will be placed for grading. Shape subgrade as indicated on Drawings, and prepare by forking, furrowing, or plowing so that the first layer of new material placed therein will be bonded to it.
- B. As directed by the ENGINEER, over-excavate unacceptable materials below the foundation subgrade. Backfill the over-excavation with compacted gravel.
- C. Proof roll the foundation subgrade prior to backfilling and filling operation, or placing foundation concrete.
- D. Proof roll the pipe trench foundation subgrade prior to backfilling and filling operations, or placing soil-supported pipeline.
- E. Utilize excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the pipe trench foundation subgrade to avoid disturbance of the bearing surface. Tamp the exposed subgrade with the excavating bucket prior to backfilling and filling operation, or placing soil-supported pipeline.

3.13 CARE AND RESTORATION OF PROPERTY

- A. Enclose uncut tree trunks adjacent to Work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to Work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- B. Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.
- C. Protect cultivated hedges, shrubs, and plants that might be injured by the CONTRACTOR'S operations by suitable means or dig up and temporarily re-plant and maintain. After construction operations have been substantially completed, re-plant in original position and care for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to effect their growth or diminish in their beauty or usefulness, replace with items of equal kind and quality existing at the start of Work.
- C. Restore surfaces damaged by the CONTRACTOR'S operations to a condition at least equal to that in which they were found immediately before Work commenced. Use suitable materials and methods for such restoration.

3.14 BACKFILLING – GENERAL

- A. Do not place frozen materials in backfill or place backfill upon frozen materials. Remove previously frozen material or treat before new backfill is placed.
- B. Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- D. Do not use puddling, ponding, or flooding as a means of compaction.

3.15 MATERIAL PLACEMENT AND COMPACTION REQUIREMENTS

- A. Compacted Gravel
 - 1. Dump and spread in layers not to exceed 8 inches uncompacted thickness.
 - 2. Compact, fill, and backfill under structure and bedding for pipes (from below pipe to spring line) to not less than 95 percent. Compact to not less than 90 percent in other areas unless otherwise indicated.
- B. Crushed Stone
 - 1. Dump and spread in layers not to exceed 12 inches uncompacted thickness.
 - 2. Compact using self-propelled vibratory steel drum or rubber tire rollers with a minimum of 4 passes in direction perpendicular to one another in open areas. In small areas, use manually operated vibratory plate compactors with a minimum of 4 passes.

- C. Acceptable Materials for Use as Non-Structural Fill:
 - 1. Dump and spread in layers not to exceed 12 inches uncompacted thickness.
 - 2. Compact to not less than 90 percent unless otherwise indicated.
- D. Backfilling and filling operation shall be suspended in areas where tests are being made until tests are completed and the testing laboratory has advised the ENGINEER that adequate densities are obtained.

3.16 STRUCTURAL FILL AND BACKFILL UNDER STRUCTURES

- A. Compact fill and backfill under structures and pavements with compacted gravel or crushed stone as specified and indicated.
- B. Conduct hydraulic testing as soon as practicable after structures are constructed and other necessary Work has been done. Start backfilling promptly after completion of tests.
- C. Deposit material evenly around structure to avoid unequal soil pressure.
- D. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage.

3.17 NON-STRUCTURAL BACKFILL

- A. Use acceptable materials for non-structural backfill and compacted as specified and indicated.

3.18 BACKFILLING PIPE TRENCHES

- A. General
 - 1. Begin backfilling and proceed until completed after: the pipes and conduits have been laid, joints have acquired maximum degree of hardness, pipelines and conduits have successfully passed tests and inspections as required in the Specifications and concrete or masonry structures within the trench have reached their design strength to support all loads.
 - 2. Backfill and compact indicated materials under, around, and above pipes, conduits, and other structures to the indicated or specified compaction density requirement. Utilize compaction devices that will not damage the pipe, conduit, or structure within the trench.
 - 3. Do not drop backfill material into trench from a height of more than 5 feet or in a manner that will damage the pipe, conduit, or other structure within the trench.
- B. Pipe Trenches
 - 1. Materials:

- a. From below pipe to 1 ft. above spring line: Use crushed stone or controlled low strength material (CLSM) as indicated.
- b. One foot above pipe to finished grade or to pavement subbase: Use compacted gravel unless otherwise indicated.
2. Compacting Around Pipes: Compact material around circumference of pipe and the area between the trench wall and the pipe by hand tamping in 6" layers.
3. Compacting Above Pipe: Compact material by hand tamping. If trench width is wide enough to accommodate power tools and the compacted material over the pipe will support the load of the power tools without damage to the pipe, use rollers or other powered compaction equipment above to more readily achieve compaction requirements.
4. Controlled Low Strength Material (CLSM) as backfill
 - a. CLSM shall only be placed when the ambient temperature is at least 30° F and rising. CLSM material shall be deposited within 2 hours of initial mixing.
 - b. CLSM may be placed by chutes, conveyors, buckets or pumps depending upon the application and accessibility of the site. Should voids or cavities remain after the placement of the CLSM, the CONTRACTOR shall modify the placement method or flow characteristics of the CLSM. Voids or cavities which have not been filled properly shall be corrected as directed by the ENGINEER and at the CONTRACTOR'S expense.
 - c. The CONTRACTOR shall insure that pipe floatation or misalignment does not occur during placement of CLSM. Where required, pipe straps, soil anchors, or other approved means of restraining pipe movement shall be utilized. Material may be placed in stages with initially lesser flowability, to prevent movement or flotation of pipe.
 - d. Compaction of flowable backfill will not be required. The maximum layer thickness shall be 3 feet. Additional layers shall not be placed until the backfill has lost sufficient moisture to be walked on without indenting more than 2 inches. Any damage resulting from placing CLSM in layers that are too thick or from not allowing sufficient time between placement of layers shall be repaired in a method approved by the ENGINEER at the CONTRACTOR'S expense.

3.19 MATERIAL FOR FILLING AND EMBANKMENTS

- A. Use acceptable materials for filling and building embankments unless otherwise indicated.

3.20 PLACING AND COMPACTING EMBANKMENT MATERIAL

- A. Compact fill material as specified and indicated.
- B. Perform fill operation in an orderly and systematic manner using equipment in proper sequence to meet the specified compaction requirements.
- C. Place fill on surfaces that are free of unacceptable materials.

- D. Begin filling in lowest section of Work area. Grade surface of fill approximately horizontal but provide with sufficient longitudinal and transverse slope to allow for runoff of surface water from every point.
- E. Conduct filling so that no obstruction to drainage from other sections of fill area is created at any time.
- F. Install temporary dewatering sumps in low areas during filling operation where excessive amounts of rain runoff collect.
- G. Reduce moisture content of fill material, if necessary, in source area by working it over under warm and dry atmospheric conditions. A large disc harrow with two to three foot diameter disks may be required for working soil in a drying operation.
- H. Compact uniformly throughout. Keep surfaces of fill reasonably smooth and free from humps and hollows that would prevent proper and uniform compaction. Do not permit hauling equipment to follow a single track on the same layer but direct equipment to spread out to prevent over-compaction in localized areas. Take care in obtaining thorough compaction at edges of fill.
- I. Slightly slope surface of fill to ensure drainage during periods of wet weather. Do not place fill while rain is falling or after a rainstorm until the ENGINEER considered conditions satisfactory. During such periods and upon suspension of filling operations for any period in excess of 12 hours, roll smooth the surface of fill using a smooth wheel static roller to prevent excessive absorption of rainfall and surface moisture. Prior to resuming compaction operations, remove muddy material off surface to expose firm, compacted material, as determined by the ENGINEER.
- J. When fill is placed against an earlier fill or against in-situ material under and around structures, including around piping beneath structures or embankments, slope junction between two sections of fill, 1 vertical to 1.5 horizontal. Bench edge of existing fill 24 inches to form a serrated edge of compact stable material against which to place the new fill. Ensure that rolling extends over junction between fills.
- K. When fill is placed directly upon another older fill, clean surface thoroughly of debris and remove any loose material. Then proof-roll the entire old surface.
- L. After spreading each loose lift to the required thickness and adjusting its moisture content as necessary, roll with sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips that by means of sufficient overlap will ensure complete coverage and uniform compaction of an entire lift. Do not make additional passes until previous pass has been completed.
- M. In case material of any fill sinks and weaves under roller or under hauling units and other equipment, required degree of compaction is not being obtained. Reduce the moisture content. If such sinking and weaving produces surface cracks, suspend operations on the part of the embankment until it becomes sufficiently stabilized. Ideal condition in fill is that attained when the entire fill below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as roller passes. Spread out rolling operations over the maximum practicable area to minimize condition of sinking and weaving.

- N. If because of defective Workmanship, compaction obtained over any area is less than that required, remedy condition at no cost to OWNER. If additional rolling or other means fail to produce satisfactory results, remove material in that area down to a level of satisfactory density. Perform removal, replacement, and re-rolling without additional compensation.

3.21 COMPACTION CONTROL OF BACKFILL, FILL, AND EMBANKMENT

- A. Compact to density specified and indicated for various types of material. Control moisture content of material being placed as specified or if not specified, at a level slightly lower than optimum.
- B. The soil testing laboratory shall provide inspection during filling or backfilling operations to ensure compaction of compacted gravel or crushed stone and record compaction equipment in use.
- C. Moisture control may be required either at the stockpile area, its, or on embankment or backfill. Increase moisture content when material is too dry by sprinkling or other means of wetting uniformly. Reduce moisture content when material is too wet by using ditches, pumps, drainage wells, or other devices and by exposing the greatest possible area to sun and air in conjunction with harrowing, plowing, spreading of material or any other effective methods.

3.22 ALLOWANCE FOR SHRINKAGE

- A. Build embankment or backfill to a height above finished grade that will in the opinion of the ENGINEER allow for the shrinkage or consolidation of material. Initially, provide at all points, an excess of at least one percent of total height of backfill measured from stripped surface to top of finished surface.
- B. Supply specified materials and build up low places as directed without additional cost if embankment or backfilling settles so as to be below the indicated level for proposed finished surface at any time before final acceptance of the Work.

END OF SECTION 02210

SECTION 02211**ROCK EXCAVATION AND DISPOSAL****PART 1 – GENERAL****1.01 DESCRIPTION**

- A. Remove and dispose of rock as required for construction. Furnish material for backfill in place of excavated rock as indicated or specified.
- B. If rock excavation and disposal becomes required, it shall be implemented using non-explosive techniques.

1.02 RELATED WORK

- A. Division 1: General Requirements
- B. Section 02018: Vibration Monitoring
- C. Section 02140: Dewatering
- D. Section 02210: Earth Excavation, Backfill, Fill and Grading
- E. Section 02224: Compacted Gravel
- F. Section 02435: Crushed Stone

1.03 QUALITY ASSURANCE

- A. Provide according to Section 01400.
- B. Implement the requirements of Section 02018 if rock removal becomes required, if so directed by the Engineer.

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01300:
 - 1. Submit a written description of non-explosive methods to be utilized, coordinated with the vibration monitoring plan required by Section 02018, if required by the Engineer.

1.05 SITE CONDITIONS

- A. Subsurface conditions: Refer to project plans.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with Section 01610

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Class A Concrete (1,500 psi concrete), as specified in Section 03300
- B. Compacted gravel as specified in Section 02224
- C. Crushed stone as specified in Section 02435

PART 3 – EXECUTION

3.01 PROCEDURE

- A. Excavate rock encountered, after measurement, to the design grade indicated. Any rock excavation required shall be by non-explosive techniques such as barring and wedging, jackhammer, rock jacks, non-explosive demolition agents, hydraulic hammers, or other methods approved by the Engineer.
- B. If any of the non-explosive methods proposed and/or implemented introduce vibrations or creates noise which, in the opinion of the Engineer, exceeds the requirements specified, Contractor, when so directed, shall implement a vibration monitoring program, as specified in Section 02018.
- C. When rock is encountered and its removal is necessary, the Contractor shall strip or expose the work to such an extent that, in the opinion of the Engineer, the necessary measurements can be taken.
- D. If evidence of displacement or damage to utilities, equipment, buildings, or structures is observed or reported, and/or the vibration criteria as specified in Section 02018 are exceeded, immediately notify the Engineer, discontinue rock removal operations and submit to the Engineer revised procedures for non-explosive rock removal for review and acceptance.
- E. Fill over-excavation in pipe trenches below elevation of the top of bedding, cradle, or envelope with material of same type and placed and compacted in same manner as specified in Section 02210 for trench and backfill compaction. For excess excavation beneath foundations, fill with Class A concrete or crushed stone. The material and placement of material to bring the excavation back to design grade shall be at no additional cost to the Owner.
- F. Restore or replace utilities, equipment, buildings, or structures damaged by rock removal operations at not additional cost to the Owner.

END OF SECTION

SECTION 02224
COMPACTED GRAVEL

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide and Compacted Gravel as indicated and specified.

1.02 RELATED WORK

- A. Division 1: General Requirements
B. Section 02210: Earth Excavation, Backfill, Fill and Grading

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications
1. D422: Test Method for Particle-Size Analysis of Soils
 2. D1140: Test Method for Amount of Material in Soils Finer than the No. 200 (75um) Sieve
 3. D1557: Test Method for Laboratory Compaction Characteristics of soil using Modified Effort (56,000 ft-lbf/ft³ (600 kN-n/m³))

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
1. Gradation and compaction test results from the soil testing laboratory, at least two (2) weeks prior to hauling material, for the ENGINEER'S acceptance.
 2. Submit a 20-lb. sample of the material when requested by the ENGINEER.

1.05 QUALITY ASSURANCE

- A. Qualifications of the independent soil testing laboratory as specified in Section 02210.
B. Maximum particle size and gradation analyses shall be performed in accordance with ASTM D422. Soil compaction test shall be performed in accordance with ASTM D155 Procedure C.
C. Material testing frequency and requirements as specified in Section 02210.

PART 2 – PRODUCTS

2.01 MATERIAL

- A. Compacted Gravel shall be material obtained from off-site borrow sources for use in pavement base/subbase, utility trench backfills beneath paved areas, and other areas where indicated on the Contract Documents. It shall consist of inert material that is hard, durable sand and gravel or crushed rock, free of organic material, loam, trash, debris, snow, ice or frozen soil, or other deleterious materials as determined by the ENGINEER. Suitable material shall be well-graded within the following gradation requirement:

Sieve Size	Percent Passing by Weight
1 1/2"	100
3/4"	45 – 80
1/4"	25 – 60
No. 10	15 – 45
No. 40	5 – 25
No. 100	0 – 10
No. 200	0 – 5

PART 3 – EXECUTION

3.01 PLACEMENT AND COMPACTION

- A Specified in Section 02210 and where indicated on the drawing.

END OF SECTION 02224

SECTION 02225**PROCESSED AGGREGATE BASE**

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The processed aggregate base shall consist of a single course foundation constructed on the compacted gravel base/sub-base in accordance with these specifications and in conformity with the lines, grades, compacted thickness and typical cross section as shown on the plans.

1.02 RELATED WORK

- A. Division 1 "General Requirements"
- B. Section 02210: "Earth Excavation, Backfill, Fill and Grading"
- C. Section 02224 "Compacted Gravel"
- D. Section 02500 "Bituminous Concrete Pavement"

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications
 - 1. D422: Test Method for Particle-Size Analysis of Soils
 - 2. D1140: Test Method for Amount of Material in Soils Finer than the No. 200 (75um) Sieve
 - 3. D1557: Test Method for Laboratory Compaction Characteristics of soil using Modified Effort (56,000 ft-lbf/ft³ (600 kN-n/m³))

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
 - 1. Gradation and compaction test results from the soil testing laboratory, at least two (2) weeks prior to hauling material, for the Engineer's acceptance.
 - 2. Submit a 20-lb. sample of the material when requested by the Engineer.

1.05 QUALITY ASSURANCE

- A. Qualifications of the independent soil testing laboratory as specified in Section 02210.
- B. Maximum particle size and gradation analyses shall be performed in accordance with ASTM D422. Soil compaction test shall be performed in accordance with ASTM D155 Procedure C.
- C. Material testing frequency and requirements as specified in Section 02210.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. The processed aggregate base material shall conform to Article M.05.01 of Form 817.

PART 3 - EXECUTION

3.01 SUBBASE PREPARATION

- A. Should the sub-base material become mixed with the processed aggregate base material at any time, the Contractor shall, without additional compensation remove the mixture. The Contractor shall add new sub-base material if required and reshape and re-compact the sub-base in accordance with the requirements of these specifications. New processed aggregate base material shall be added, compacted and bound as specified herein to match the surrounding surface.
- B. Processed aggregate base should not be installed on the sub-base unless the sub-base has been compacted as specified in Section 02210 and is not saturated or weaving under compactive effort.

3.02 PLACEMENT AND COMPACTION

- A. Placement and compaction procedures and installation tolerance and testing for the processed aggregate base shall be the same as for the compacted gravel fill base as specified in Section 02210 "Earth Excavation, Backfill, Fill and Grading".

END OF SECTION 02225

SECTION 02435
CRUSHED STONE

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide and compact crushed stone as indicated and specified.

1.02 RELATED WORK

- A. Division 1 “General Requirements”
- B. Section 02210 “Earth Excavation, Backfill, Fill and Grading”

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications:
 - 1. C33: Specification for Concrete Aggregates
 - 2. D422: Test Method for Particle-Size Analysis of Soils

1.04 SUBMITTALS

- A. Submit the following in accordance with Section 01300 – SUBMITTALS:
 - 1. Gradation test result from the soil testing laboratory, at least two (2) weeks prior to hauling material, for the Engineer’s acceptance.
 - 2. Submit a 20-lb. sample of the material when requested by the ENGINEER.

1.05 QUALITY ASSURANCE

- A. Qualifications of the independent soil testing laboratory as specified in Section 02210.
- B. Maximum particle size and gradation analyses shall be performed in accordance with ASTM D422.
- C. Material testing frequency and requirements as specified in Section 02210.

PART 2 – PRODUCTS

2.01 MATERIAL

- A. Crushed Stone: Gradation and physical property requirements of crushed stone shall conform to the grading requirements of Article M.01.01 and the physical properties of Article M.01.20 of Standard Specifications Form 817.
- B. Crushed stone shall be free from roots, leaves, and other organic materials, and free of ice, snow or frost and frozen soil particles.

PART 3 – EXECUTION

3.01 PLACEMENT AND COMPACTION

- A. Specified in Section 02210 and as indicated on the Drawings.

END OF SECTION 02435

SECTION 02500**BITUMINOUS CONCRETE PAVEMENT**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This section includes all materials, labor, equipment, services, etc., necessary and incidental to the completion of all bituminous concrete pavement installation as shown on the Project Drawings and as specified herein.

1.02 RELATED WORK

- A. Section 02210 “Earth Excavation, Backfill, Fill And Grading”
- B. Section 02224 “Compacted Gravel”
- C. Section 02225 “Processed Aggregate Base”

1.03 REFERENCES

- A. The Standard Specifications: Requirements of the Standard Specifications for Roads, Bridges, and Incidental Construction, State of Connecticut, Department of Transportation, Form 817, together with all errata, addenda, additions, revisions, and supplemental specifications.
- B. When reference is made to a particular section of “Form 817”, it will be construed to include all related articles referred to in said section.

1.04 SUBMITTALS

- A. Mix designs with laboratory tests certifying conformance with specifications for the paving material.
- B. Certification by the paving material plant of conformance with referenced standards.
- C. Plant batch slips with each batch of material delivered to site giving information as required by the ENGINEER.

1.05 QUALITY ASSURANCE

- A. Permanent pavement shall not be installed when the ambient temperature is less than 40° F, the weather is foggy, or raining. The base must be dry and free of frost.
- B. Prior to excavation in paved areas, cut surface of existing pavement with a masonry saw. Pavement to be cut in straight line on both sides of proposed trench for entire length of job.

- C. Temporary pavement shall be placed over trenches on a daily basis in paved areas and where directed by ENGINEER. Temporary pavement shall be maintained until permanent pavement is placed.
- D. Where operations of CONTRACTOR result in removal of or damage to pavement, sidewalks or curbing, affected portions shall be removed as directed by ENGINEER and replaced with pavement or curbing as specified.
- E. Until the expiration of the guarantee period, maintain surfacing placed under this Contract and promptly correct any defect such as cracks, depressions, and holes with materials as specified.
- F. Manhole covers, catch basin grates, valve and meter boxes shall be adjusted to finished grade, adequately protected and left in clean condition.
- G. Feathering edges between new and existing pavement is not allowed when replacing pavement.
- H. Paving plant used for preparation of the bituminous concrete as acceptable to ENGINEER with right to inspect plant and material preparation.
- I. Equipment, tools, and machines used in the performance of the cold milling shall be maintained in a satisfactory Work condition. The cold milling machine shall be a self-propelled machine especially designed and built for milling bituminous pavement and capable of milling the pavement to the specified depth and smoothness. The pavement milling machine shall be capable of establishing grade control; shall have means of controlling transverse slope; and shall have effective means of controlling dust produced during the pavement milling operation. The machine shall have the ability to remove all millings or cuttings from the pavement and load them directly into a truck. The milling machine shall not cause damage to any part of the pavement structure that is not to be removed. Variable lacing patterns shall be provided to permit a rough grooved surface on bituminous surfaces left in place. The striations produced shall not be greater than $\frac{3}{8}$ inch nor less than $\frac{1}{4}$ inch deep unless otherwise directed.
- J. All cleaning equipment shall be suitable for removing and cleaning loose material from the pavement surface. Power brooms shall be used when directed.
- K. Milling shall not be performed when there is accumulation of snow or ice on the pavement surface.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Bituminous concrete for temporary pavement and binder course shall conform to the requirements of Article M.04.01 and M.04.02, Form 817, Class 4.
- B. Bituminous concrete base course shall conform to the requirements of Article M.04.01 and M.04.02, Form 817, Class 1 or Class 4 as indicated.
- C. Bituminous concrete wearing course shall conform to the requirements of Article M.04.01 and M.04.02, Form 817, Class 1 or Class 2 as indicated.

- D. Joint filler and sealant shall be bituminous cellular type conforming to AASHTO M213 and hot poured rubber type sealant conforming to AASHTO M173.

PART 3 – EXECUTION

3.01 INSPECTION OF BASE

- A. Prior to commencing with paving operations, the installer of this Work shall inspect the base and notify the ENGINEER, in writing, of any condition which will prevent him from the proper execution of the Work and/or will not drain all paved surfaces. Failure of notice shall be deemed as acceptance of the Work.

3.02 MEANS AND METHODS

- A. The means and methods employed by the CONTRACTOR in performing the Work and all equipment, tools, machinery and plant used in handling material and executing any part of the Work, shall be subject to the approval of the Engineer before the Work is started and, whenever found unsatisfactory, shall be changed and improved as required by the ENGINEER at no additional cost to the OWNER. All equipment, tools, machinery and plant used must be maintained in a satisfactory working condition.

3.03 TEMPORARY PAVEMENT

- A. Prior to placing temporary pavement, backfill shall be compacted as required under “Earth Excavation, Backfill, Fill and Grading”, to eliminate settling of backfill. No pavement is to be placed over poorly compacted backfill.
- B. Base course shall be installed to proper elevation and dressed so that temporary pavement construction is at required grade. Maintain surfaces of disturbed area until pavement is placed. If there is a time lapse such that the base course has been eroded or disturbed by traffic, restore to acceptable condition before placing paving.
- C. Remove and acceptably dispose of all surplus and unsuitable material.
- D. Place and maintain temporary pavement of 4 inches compacted bituminous concrete mixture, in safe and reasonably smooth condition until permanent pavement is placed.
- E. Temporary pavement shall be installed over all excavated trenches in existing paved area following proper preparation, at the end of each workday.

3.04 INSTALLATION OF BITUMINOUS CONCRETE PAVEMENT

- A. The installation of bituminous concrete pavement shall be in accordance with the requirement of Section 4.06.03 of Form 817 and these Specifications.

- B. The sequence of the bituminous concrete placing operations shall be as required to secure tight and well-compacted longitudinal joints.
- C. Before compaction, the finished surface struck by the machine shall be checked. Depressions shall be filled and drippings shall be removed.
- D. In areas where, on account of irregularities or unavoidable obstacles, the use of mechanical spreading and finishing equipment is impracticable, the mixture may be spread and screened by hand, subject to the approval of the ENGINEER.
- E. All vertical contact surfaces shall be painted with a uniform coat of hot asphalt cement, just before bituminous concrete is placed against them.
- F. The top of the binder course shall be thoroughly cleaned prior to installation of the wearing course. If binder course is over 5 days old the CONTRACTOR shall install a tack coat in accordance with the requirements of article 4.06.05 of the Standard Specifications Form 817.
- G. Bituminous concrete shall only be installed when the surface is dry, the atmospheric temperature in the shade is at least 40° F and the weather is not foggy or rainy. The ENGINEER may, however, permit Work of this character to continue when overtaken by sudden storms, up to the amount of which may be in transit from the plant at the time, provided the mixture is within temperature limits specified. Upon arrival, the mixture shall be dumped into the approved mechanical spreader and immediately spread and struck off the full width required and to such appropriate loose depth for each successive course that when the Work is completed the weight of the mixture required per square yard will be secured. The mechanical equipment shall strike off each course. For use in striking off the bottom course, the machine shall be equipped with easily adjustable strike-off plates.
- H. The refueling of equipment in such position that fuel might be spilled on a bituminous concrete mixture already placed or to be placed is prohibited.

3.05 COMPACTION

- A. After the courses have been screened as specified, each course shall be compacted to a density of at least 92% and no more than 97% of the theoretical void free density. When the course spread has set sufficiently or come to the proper condition, it shall be rolled at such a speed as not to cause undue displacement or shoving.
- B. Compaction testing shall be undertaken by the OWNER'S testing laboratory.
- C. Rollers used to compact the course shall be power driven rollers weighing not less than ten (10) tons. If only one roller is used, it shall be a tandem roller; a second roller may be of the three-wheel type. The roller wheels shall be wet with only sufficient water to moisten the wheel surface.
- D. Rolling shall begin at the sides and progress toward the center, uniformly lapping at least one-half width of the compacting wheel of the roller. Alternate trips of the roller shall be terminated in stops at least three (3) feet in distance from any preceding stop. The ENGINEER may direct other rolling procedures, as conditions may require. Rolling shall be discontinued if the surface shows signs of cracking and shall be continued later as directed by the ENGINEER.

- E. The speed of the roller shall not exceed three (3) miles per hour and shall at all times be slow enough to avoid displacement of the hot mixture. The rollers shall be in good condition. They shall be operated by experienced rollermen and must be kept in continuous operation as nearly as practicable in such manner that all parts of the pavement shall receive substantially equal compaction.
- F. In all places inaccessible to a roller, such as adjacent to curbs, headers, gutters, bridges, manholes, etc., the required compaction shall be obtained with tamps. Depressions that may develop before the completion of the rolling shall be remedied by adding new material to bring such depressions to a true surface. Should any depressions remain after the final compaction, new material shall be added to form a true and even surface. All high spots, high joints and other defects shall be adjusted as required.

3.06 JOINTS

- A. Placing of the courses shall be as nearly continuous as possible and the roller shall pass over the unprotected end of the freshly laid mixture only when the laying of the course is discontinued or interrupted for an appreciable period and joints shall be formed at such joints. Where joints are to be formed, the end of the freshly laid mixture shall be cut "square" with the pavement, slightly set up with the back of a metal lute and rolled at slow speed so as to cause as little feathering as possible. Before new material is laid the joint shall be cut back and a thin coating of hot asphalt paint should be applied to the joint.

3.07 SURFACE TEST OF THE PAVEMENT

- A. For the purpose of testing the finished surface, a standard template cut to the true cross section of the road and a ten (10') foot straight edge shall at all times be available on the Work.
- B. The CONTRACTOR shall provide or designate an employee whose duty will be to confirm the compacted course thickness and checking all rolled surfaces during the execution of the Work.
- C. The finished pavement surface shall be such that it will not vary more than one-quarter (1/4") inch from the template cut to the cross-section of the road or more than one quarter (1/4") inch from a ten (10') foot straight edge applied parallel to the center line of the pavement. Any irregularity of the surface exceeding the above limits shall be corrected.
- D. Where the thickness of the bituminous concrete is less than that shown on the Drawings by more than one-quarter (1/4") inch, the CONTRACTOR, with the permission of the ENGINEER, shall place a correction course not less than one (1") inch in depth after compaction. The CONTRACTOR shall reconstruct by cutting back and into the pavement of an acceptable depth to the ENGINEER and place new material to achieve the proper depth, cross-section and profile.

3.08 PROTECTION OF WORK

- A. Sections of the newly finished work shall be protected from traffic at least six (6) hours, or until they have become properly hardened by cooling.

3.09 MAINTAINING BITUMINOUS CONCRETE SURFACES

- A. Until the expiration of the guarantee period, maintain surfacing placed under this Contact and promptly correct any defect such as cracks, depressions, high points and holes that may occur. Surfacing kept in a safe and satisfactory condition for traffic. If defects occur in surfacing constructed by CONTRACTOR, remove surface material and base course as is necessary to properly correct defects. Replace base course and surface material.

END OF SECTION 02500

SECTION 2510**PAVEMENT MARKINGS****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Providing all materials, labor, equipment, service, etc., necessary and incidental to the completion of all Pavement Markings as shown on the drawings and as specified herein.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections include the following:
 - 1. Section 02500 "Bituminous Concrete Pavement"

1.03 SUBMITTALS

- A. Submit copies of manufacturer's product data with installations instructions.
- B. Submit Manufacturer's certificate of compliance with these specified requirements.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Epoxy Resin Pavement Markings shall conform to the requirements of Article M.07.22 of Form 817. All Pavement Markings shall be white unless otherwise indicated on the Contract Drawings

PART 3 - EXECUTION**3.01 PREPARATION**

- A. Inspect the areas to receive painted pavement markings. Clean surfaces as required for the manufacturer's written installation and warranty requirements.

3.02 PAINTING

- A. Apply the Epoxy Resin Pavement Markings in strict compliance with Section 12.10.03 of Form 817 and the manufacturer's written installation requirements.

3.03 PROTECTION

- A. Protect all pavement markings from until completely dry.

END OF SECTION

SECTION 02568**EROSION AND SEDIMENTATION CONTROLS**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all Work and take all measures necessary to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area as to prevent damage to any stream or wetlands.

1.02 REFERENCES

- A. “2002 Connecticut Guidelines for Soil Erosion and Sediment Control”, published by the Connecticut Council on Soil and Water Conservation, in cooperation with the Connecticut Department of Environmental Protection.
- B. “Guide-lines for Erosion and Sediment Control, Planning and Implementation” and “Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity”, published by the United States Environmental Protection Agency, Guidelines for Soil Erosion and Sediment Control – Connecticut.
- C. Erosion and Sedimentation Control Plan prepared by ENGINEER as part of the project Drawing plan set.

1.03 SUBMITTALS

- A. Two weeks prior to the start of the Work, submit to ENGINEER, for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

1.04 QUALITY ASSURANCE

- A. Use acceptable procedures, including use of water diversion structures, diversion ditches, settling basins, and sediment traps.
- B. Operations restricted to areas of Work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.
- C. If construction materials are washed away during construction, remove materials from fouled areas.
- D. Stabilize diversion outlets by means acceptable to ENGINEER.

- E. ENGINEER has authority to limit surface area of erodable earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct immediate permanent or temporary pollution control measures to prevent contamination of any stream or wetlands, including construction of temporary berms, dikes, dams, sediment basins, sediment traps, slope drains, and use of temporary mulches, mats, or other control devices or methods as necessary to control erosion.

PART 2 – PRODUCTS

2.01 BALES

- A. Hay or straw or other suitable material acceptable to ENGINEER.
- B. Hay or straw with 40 pounds minimum weight and 120 pounds maximum weight.
- C. Post or stakes for hay/straw bales shall be a minimum of 1.5 inches square x 36 inches long for hardwood stakes, and a minimum weight of 0.5 pound per linear foot and at least 36 inches long for steel posts.

2.02 SYNTHETIC FILTER FABRIC

- A. Synthetic filter fabric to be a pervious sheet of polypropylene, nylon, polyester or ethylene filaments and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Geotextile Silt Fencing Minimum Requirements

<u>Physical Property</u>	<u>Test Method</u>	<u>Minimum Requirements</u>
Filtering Efficiency	ASTM 5141	75% (min.)
Grab Tensile Strength (lbs.)	ASTM D4632	100 lbs.
Elongation @ Failure	ASTM D4632	15%
Mullen Burst Strength	ASTM D3786	250 psi
Puncture Strength	ASTM 4833	50 lbs.
Apparent Opening Size	ASTM D4751	No less than .90 mm /No greater than .60 mm
Flow Rate	ASTM D4491	0.2 gal/ft ² /min
Permativity	ASTM D4491	0.05 sec -1 (min)
Ultraviolet Radiation Stability %	ASTM D4355	70% after 500 hours of exposure (min)

- B. Posts or stakes for filter fences shall be 42 inches long, made of either 1.5 square hardwood stakes, or steel posts with projections for fastening the geotextile possessing a minimum strength of 0.5 pound per linear foot.

PART 3 – EXECUTION

3.01 GENERAL

- A. Do not discharge chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste into or alongside any body of water or into natural or man-made chemicals.
- B. Products are to be used in accordance with and only for applications designated in the “2002 Connecticut Guidelines for Soil Erosion and Sediment Control”.

3.02 INSTALLATION

A. Straw/Hay Bales

1. Sheet flow applications:

- a. Locate down gradient from toe of slope, bales placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. When contour cannot be followed, stagger the bale installation and install perpendicular wings to break the velocity of water flowing behind the bales.
- b. All bales either wire-bound or string tied. Bales installed so that bindings are oriented around the side rather than along the tops and bottoms of the bales to prevent deterioration of the bindings.
- c. The barrier to be entrenched and backfilled. Excavate trench the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. Each end of the trench should be winged upslope so that the bottom of the last bale is higher than the top of the lowest hay bale in the barrier. After the bales are staked and chinked, backfill the barrier with excavated soil. Backfill soil to conform to the ground level on the downhill side and be built up to 4 inches against the uphill side of the barrier. Bales placed 5 to 10 feet away from toe of slope.
- d. Each bale securely anchored by at least two stakes or rebars driven through the bale. The first stake in each bale driven toward the previously laid bale to force the bales together. Stakes or re-bars driven deep enough into the ground to securely anchor the bales, to a depth of at least 18 inches.
- e. The gaps between the bales to be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw to be scattered over the area immediately uphill from a straw bale barrier to increase barrier efficiency.
- f. In sloping areas where surface flow follows the bale line, perpendicular bale checks installed at appropriate intervals (100 feet maximum).
- g. Maximum contributing slope length:
 1. for 5:1 or shallower slope steepness, maximum slope length = 100 feet
 2. for 3:1 to 5:1 slope steepness, maximum slope length = 75 feet
 3. for 2:1 to 3:1 slope steepness, maximum slope length = 50 feet

2. Channel Flow Application

- a. Hay bale barriers are not to be used for drainage way or channel flow applications.

3. Catch Basin Application

- a. Bales shall be placed in a square or rectangular shape around depressed catchbasin inlets. Catchbasins constructed on sloping areas not to exceed 5%.
- b. Gravel backfill to be utilized.

- c. The remaining steps for installing a bale barrier for sheet flow applications apply.
4. Maintenance
- a. Inspect barrier at least once a week and within 24 hours after each storm event and repair or replacement made promptly as needed.
 - b. Cleanout of accumulated sediment behind the bales if one half of the original height of the bales becomes filled in with sediment.
 - c. When repetitive failures occur at the same location, review conditions and limitations for use and determine what additional controls are needed.

B. Silt Fences

1. Sheet Flow Applications

- a. Locate down gradient from toe of slope, generally on the contour. When the contour cannot be followed, install the fence such that perpendicular wings are created to break the velocity of the water flowing behind the bales.
- b. The height of the barrier not to exceed 30 inches.
- c. When joints are necessary, filter cloth spliced together only at a support post, with a minimum 6-inch overlap, and securely sealed. See manufacturer's recommendations.
- d. Posts spaced a maximum of 10 feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without the wire support fence, post spacing as manufacturer recommends.
- e. Excavate trench approximately 6 inches wide and 6 inches deep along the line of posts and upslope from the barrier in accordance with manufacturer's recommendation.
- f. In the absence of manufacturer's recommendations, space wire staples on wooden stakes at a maximum of 4 inches apart and alternate their position from parallel to the axis of the stake to perpendicular. Do not staple filter fabric to trees.
- g. Backfill the trench with tamped soil or aggregate over the geotextile.
- h. Remove filter barriers when they have served their useful purpose, but not before the upslope area has been permanently stabilized.
- i. Maximum contributing slope length:
 - 1. for 5:1 or shallower slope steepness, maximum slope length = 100 feet
 - 2. for 3:1 to 5:1 slope steepness, maximum slope length = 75 feet
 - 3. for 2:1 to 3:1 slope steepness, maximum slope length = 50 feet

2. Channel Flow Application

- a. Place geotextile fencing in a "U" shape formation across the swale such that the bottom of both ends of the fence are higher than the top of the lowest section of the fence.

- b. If to be used with a catch basin in a swale on a slope, place one geotextile fencing “U” immediately upslope from the catch basin, and another immediately down slope from the catch basin (as described in “a”).
 - c. Not for use in drainage ways whose flow is supported by ground water discharge.
 - d. The remaining steps of installation for sheet flow applications apply.
3. Catch Basin Application
- a. Encircle each basin
 - b. The remaining steps of installation for sheet flow applications apply.
 - c. For silt sacks, wrap filter fabric around grate and place in frame. Extend fabric behind catch basin top and backfill.
4. Maintenance
- a. Inspect filter barriers at least once a week and immediately after each rainfall and at least daily during prolonged rainfall. Perform any required repairs immediately.
 - b. Should the fabric decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, replace fabric promptly.
 - c. Remove sediment deposits when they reach approximately one-half the height of the barrier.
 - d. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required to be dressed to conform to the existing grade, prepared and seeded.
 - e. When repetitive failures occur at the same location, review conditions and limitations for use and determine what additional controls are needed.

PART 4 - EMERGENCY PROVISIONS

4.01 GENERAL EMERGENCY PROVISIONS

- A. Prior to the start of construction, the CONTRACTOR shall provide the OWNER and ENGINEER with the names and telephone numbers of the persons responsible to be contacted in the event of an erosion and/or sedimentation control problem.
- B. The CONTRACTOR shall at all times keep a sufficient amount of filter fabric fence and/or hay bales on the project site to control erosion and/or sediment problems.
- C. In the event of an erosion or sedimentation control problem, the CONTRACTOR shall promptly stabilize the problem, contain any sediment, and notify the OWNER.
- D. An increased inspection schedule for the erosion and sedimentation control measures shall be implemented by the CONTRACTOR if a significant storm event is anticipated.

- E. In addition to working hours, the effective monitoring of the erosion and sedimentation control measures on the site shall, if necessary, also be conducted during non-working hours, and includes non-working hour availability by the CONTRACTOR.

PART 5 - ADDITIONAL REQUIREMENTS

5.01 GENERAL

- A. Construct earth berms or diversions to intercept and divert runoff water from critical areas.
- B. Discharge silt-laden water from excavation onto filter fabric mat and/or baled hay or straw sediment traps to ensure that only sediment-free water is returned to watercourses. The ENGINEER must be contacted by the CONTRACTOR prior to any dewatering operations.
- C. Do not place excavated soil material adjacent to watercourse in manner that will cause it to wash away by high water or runoff.
- D. Prevent damage to vegetation by excessive watering or silt accumulation in the discharge areas.
- E. Do not dump spoiled material into any streams, wetlands, surface waters, or unspecified locations.
- F. Prevent indiscriminate, arbitrary, or capricious operation of equipment in streams, wetlands or surface waters.
- G. Do not pump silt-laden water from trenches or excavations into surface waters, streams, wetlands, or natural or man-made channels leading thereto.
- H. Prevent damage to vegetation adjacent to or outside of construction area limits.
- I. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in streams, wetlands, surface waters, or natural or man-made channels leading thereto, or unspecified locations.
- J. Do not alter flow line or any stream unless indicated or specified
- K. All topsoil stockpiles shall be surrounded by an erosion control barrier. All stockpiles not to be utilized within 30 days shall be mulched and seeded.
- L. Where applicable, an anti-tracking pad/construction entrance shall be installed and maintained by the CONTRACTOR in accordance with the "2002 Connecticut Guidelines for Erosion and Sediment Control".
- M. Consult with the "2002 Connecticut Guidelines for Erosion and Sediment Control" by the CONTRACTOR shall be required. All recommendations and guidelines presented in this reference must be adhered to, unless otherwise authorized by the ENGINEER.

END OF SECTION

SECTION 02610**LOW PRESSURE FORCE MAIN****PART 1 – GENERAL****1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including Division 1 and Division 2 apply to this specification.
- B. Section 02210 - Earth Excavation, Backfill, Fill and Grading

1.02 SUMMARY

- A. This section includes low pressure force main piping and specialties for municipal force mains and services outside of building structures.

1.03 DEFINITIONS

- A. For the purposes of this specification, the following definitions refer to the low pressure force main collection system that comes under the authority of the Town of Branford, Connecticut as specified within this section and other sections of the contract specifications.
 - 1. Low Pressure Force Main: Exterior pressure sewer system.
 - 2. Sewer Service: Exterior domestic sewer piping.

1.04 PERFORMANCE

- A. Piping Pressure Rating: At least equal to system test pressure.

1.05 SUBMITTALS

- A. Submit product data and shop drawings for the following in accordance with Section 01300 Submittals;
 - 1. Pipe
 - 2. Fittings
 - 3. Piping Appurtenances
- B. Product Certificates from Manufacturer
- C. Field Quality Control Reports

1.06 QUALITY ASSURANCE

- A. Materials and operations shall comply with the latest revision of all applicable Codes and Standards including but not limited to CT Department of Health and Town of Branford regulations.

- B. Piping material shall be marked clearly and legibly.
 - 1. PVC pipe shall show identification marks, at intervals not to exceed 5 feet, as follows:
 - a. Nominal pipe diameter
 - b. Company, plant, shift, ASTM, SDR, and date designation
 - c. Service designation or legend

1.07 STANDARD ABBREVIATIONS

ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
HDPE	High Density Polyethylene Pipe
PE	Polyethylene
PPI	Plastic Pipe Institute
SDR	Standard Dimension Ratio

1.08 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Pipe Condition/Pipe Examination
 - 1. New Pipe Inspection: Inspect material thoroughly upon arrival. Examine materials for damage. Remove damaged or rejected material from site. Pipe shall be protected during handling against impact shocks and free fall. Pipe shall be kept clean at all times, and no pipe shall be used in the work that does not conform to the appropriate ASTM Specifications. Check pipe closely for smoothness, roundness, chips and cracks which may be a source of infiltration. Reject any pipe that will not provide watertight seal or is otherwise structurally deficient.
 - 2. Pre-Installation Inspections: Prior to being installed, each pipe shall be carefully examined for damage and conformity with these specifications All pipe damaged or deemed not to conform to these specifications shall be rejected and removed from the site.
- B. Protect pipe coating during handling using methods recommended by the manufacturer. Use of bare cables, chains, hooks, metal bars, or narrow skids in contact with coated pipe is not permitted.
- C. Observe manufacturer's directions for delivery and storage of material and accessories.
- D. Protect stored piping from entry of water or dirt into pipe.
- E. Support pipe to prevent sagging or bending. Do not store plastic pipe, structures, and fittings in direct sunlight.
- F. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.09 PRODUCT CONDITIONS

1.09.1 SEPARATION OF WATER AND SANITARY AND/OR COMBINED SEWERS

Follow the Health Code Standards for separation of water mains and sanitary sewer lines.

A. Parallel Installations

1. Normal Conditions – force main sewer shall be constructed at least 10 feet horizontally from a water line. The distance shall be measured edge-edge.
2. Unusual Conditions – When local conditions prevent a horizontal separation of at least 10 feet, the sewer line may be laid closer to a water line provided that:
 - a. The bottom (invert) of the water line is at least 18 inches above the top (crown) of the Sewer.
 - b. Where this vertical separation cannot be obtained, the sewer PVC ASTM D 1785/ASTM D 2665, Schedule 40 or 80 and pressure tested in place without leakage prior to backfilling. The sewer manhole shall be of watertight construction and tested in place.

B. Crossing

1. Normal Conditions – sewer force mains shall be constructed at least 10 feet horizontally from a water line. The distance shall be measured edge-edge.
2. Unusual Conditions - When local conditions prevent a horizontal separation of at least 10 feet, the force main may be laid closer to a water main provided that:
 - a. Sewers passing over or under water lines shall be constructed of the material described in paragraph A, Parallel Installation, Unusual Conditions – subparagraph 1) b, above.
 - b. Water lines passing under force mains shall, in addition, be protected by providing:
 - i. A vertical separation of at least 18 inches between the bottom of the force main and the top of the water line.
 - ii. Adequate structural support of force mains to prevent excessive deflection of the joints, and the settling on and braking of the water line.
 - iii. That the length of the water line be centered at the point of crossing so that joints shall be equal distant and as far as possible from the force main.

- C. Sanitary and/or Combined Sewers or Manholes – No water mains/pipes shall pass through or come in contact with any part of a sewer force main or manhole.

1.09.2 PROTECTION OF WELLS

No sewer shall pass within 75 feet of a drinking water supply well, source, or structure unless special construction and pipe material are used to obtain adequate protection.

1.10 COORDINATION

- A. Coordinate tie-ins to sewer manhole with the Town of Branford.

PART 2 – PRODUCTS

2.01 – PIPE AND FITTINGS

2.01.1 PVC PIPE

- A. PVC Pipe: Less than 4 inches in diameter.
 - 1. Pipe shall be manufactured from a PVC ASTM D1785/ASTM D 2665, Schedule 40 or 80.
 - 2. Pipe shall be pressure Class 200 pipe.
- C. Fittings
 - 1. All fitting shall be fully pressure rated to match the pipe SDR pressure rating to which they are made. All fittings shall be molded or fabricated by the manufacturer. No contractor fabricated fittings are allowed.
 - 2. The PVC pipe manufacturer shall supply all PVC fittings, accessories, adapters, and/or special components required to perform the work.

2.02 METALLIC LOCATING WIRE: See Section 02210 Earth Excavation, Backfill, Fill and Grading.

2.03 SERVICE BOXES

Service Boxes shall meet the following requirements:

- A. “Erie” style, cast iron arch pattern base, 1” inside diameter steel upper barrel, adjustable from 4-5 feet, Bibb-Ste. Croix model U150 or approved equal.
- B. Plug shall be brass.
- C. Box shall be easily detected when buried.

2.04 WARNING TAPE: See Section 02210 Earth Excavation, Backfill, Fill and Grading.

PART 3 - EXECUTION

2.01 PIPE INSTALLATION – GENERAL

3.01.1 Construction – All Pipe

- A. Systems shall be installed as shown on the drawings and in a neat and workmanlike manner using only new materials.
- B. Trench width: per drawing details
- C. Pipe Laying Direction: Place pipe beginning at a low point and progress up hill. Install on grade with horizontal and vertical alignment as indicated on construction plans. Install all pipe and fittings per manufacturer's installation requirements.
- D. Materials shall be clean and inspected prior to installation. No cracked, broken or defective material shall be used in the work.
- E. The interior surfaces of all piping and equipment shall be cleaned and free of all dirt, loose scale, rust and other foreign material before installation.
- F. Pipe ends shall be reamed to remove all burrs and pipe sections shall be cleaned inside to remove all chips and foreign material prior to making up joints. Pipe lines shall be installed with as few joints as possible and short lengths of pipe coupled together shall not be used.
- G. When the trench is left for the night, or if pipe laying is suspended, the upper end of the pipe shall be plugged to keep out dirt, water, animals or other foreign matter or substances. This plug shall be kept in the end of the pipe line at all times when laying is not in actual progress.
- H. Air Release Valve: Install per Standard Detail. An air release valve shall be installed at peaks of 25
- I. Lateral Connections: Install per Standard Detail.

3.01.2 HDPE Pipe

- A. All pipe shall have a minimum bury of 42 inches.
- B. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used.
- C. PVC pipe shall be installed in accordance with the instruction of the manufacturer. A qualified joining technician as specified by the manufacturer shall perform all heat fusion joints.
- D. All fittings shall be butt fused, electrofused, or flanged.
 - 1. Butt Fusion Fittings – Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350. Butt Fusion Fittings shall have a manufacturing standard of ASTM D3261. Molded & fabricated fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans. Fabricated fittings are to be manufactured using a Data Logger. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the quality control records.

2. Electrofusion Fittings – Fittings shall be PE3408 HDPE, cell Classification of 345464C as determined by ATM D3350-99. Electrofusion Fittings shall have a manufacturing standard of ASTM F-1055. Fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans.
3. Flanged and Mechanical Joint Adapters – Flanged and Mechanical Joint Adapters shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D-3350. Flanged and Mechanical Joint Adapters shall have a manufacturing standard of ASTM D-3261. Fittings shall have the same pressure rating as the pipe unless otherwise specification on the plans.

3.01.3 Testing

- A. All pipe shall be field tested. Contractor shall supply all labor, equipment, materials required for testing including but not limited to pumps, meters, gauges, etc., Pipe shall be tested prior to installation of final roadway surfacing.
- B. Pressure testing shall be in accordance with manufacturer's specifications. All pipe shall be tested at 150 PSI in accordance with ASTM F 2164, "Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure", unless otherwise approved by the Engineer. A test will be considered a failure if the pressure drops by more than 5 PSI in 2 hours or exceeds allowable leakage.
- C. Pressure testing procedure
 1. Fill line slowly with water.
 2. Expel air from system during filling and before applying test pressure.
 3. Apply test pressure and allow system to stand without makeup pressure for 2 to 3 hours for expansion time.
 4. Apply specified test pressure for 2 hours.
 5. Pressure test shall be witnessed by a Town of Branford representative.
- D. Allowable Leakage
 1. HDPE Pipe – Chart 6, Allowance for Expansion Under Test Pressure, Technical Report TR31/9-79 published by the Plastic Pipe Institute (PPI).

3.02 METALLIC LOCATING WIRE

Metallic locating wire shall be installed with all plastic pipe and installation shall meet the following specification, including those in Section 02210 Earth Excavation, Backfill, Fill and Grading.

3.03 WARNING TAPE: see Section 02210 Earth Excavation, Backfill, Fill and Grading.

END OF SECTION 02610

SECTION 02900

LAWNS AND GRASSES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Provide all materials, labor, equipment, services, etc., necessary and incidental for the successful establishment of a grass cover.

1.02 RELATED WORK

- A. Drawings and general provisions of the Contract, including the Standard Specifications of the Greater New Haven Water Pollution Control Authority, apply to this Section.

1.03 REFERENCE STANDARDS AND DEFINITIONS

- A. Reference herein to any technical society, organization, group or body is made in accordance with the following abbreviations. Unless otherwise noted or specified, all work under this Section shall conform to the latest edition, as applicable.

- 1. ASTM American Society for Testing and Materials
- 2. Gravel Base: Layer placed between the subbase and topsoil to improve drainage.
- 3. Fill: Soil materials used to raise existing grades.
- 4. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- 5. Topsoil: For the purposes of this section: Surface soil layer as stripped and stockpiled that contains organic matter desirable for plant growth.
- 6. Prepared Topsoil: For the purposes of this section: Topsoil that has been screened, and amended for the purposes of establishing a seed bed for lawns and grasses.

1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass and low maintenance grass mix, identifying source, including name and telephone number of supplier.
 - C. Product Certificates: For soil amendments and fertilizers, signed by product manufacturer.
 - D. Qualification Data: For Landscape Installer.
 - E. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of lawns and meadows during a calendar year. Submit before expiration of required maintenance periods.
- 1.05 QUALITY ASSURANCE
- A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn and meadow establishment.
 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.
 - B. Preinstallation Inspection: Engineer shall be given ample opportunity to inspect finished topsoil grades and conditions prior to any planting activities. All planting or seeding done without prior approval is subject to rejection and removal at the Contractor's expense.
- 1.06 DELIVERY, STORAGE, AND HANDLING
- A. Seed: Deliver seed in original sealed, labeled and undamaged containers.
- 1.07 SCHEDULING
- A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
 1. Spring Planting: April 1 to June 15.
 2. Fall Planting: September 1 to October 15.
 - B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.
- 1.08 LAWN MAINTENANCE – PERMANENTLY SEEDED AND SODDED AREAS
- A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 1. Seeded and Sodded Lawns & Grasses: 90 days from the time sod and seed is installed or 3 mowings, whichever is greater as designated for these lawns and grasses.

- a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance period during next planting season.
- B. Maintain and establish lawns & grasses by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth lawn.
1. In areas where mulch has been disturbed by wind or maintenance operations restore topsoil grades and add new mulch. Anchor as required to prevent displacement.
- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn areas uniformly moist to a depth of 4 inches (100 mm).
1. Provide a minimum of $\frac{1}{4}$ " per acre of water per day. Amount of water per day may be adjusted by the Engineer. Watering schedule and amount shall be recorded and reported daily to the Engineer for the first three weeks after seeding and weekly thereafter.
 2. Schedule watering/control irrigation system to prevent wilting, puddling, erosion, and displacement of seed or mulch.
- D. Mowing:
1. The area shall be mowed with a reel mower set to a mowing height of 1 1/2". The Reel blades and bed knife shall be kept sharp and evenly matched to provide a clean cut. The mower shall be operated within the manufacturer's recommended speed range. The grass shall be mowed once every 5 days commencing 5 days after sod installation.
 2. Slope Lawn and Low Maintenance Lawn areas: Mow as required to facilitate overseeding during the maintenance period and once prior to final inspection.
 - a. Set mowing height of these Low Maintenance and Slope Lawn areas to 3"
 3. Other lawn areas: Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 40 percent of grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
 - a. Mow lawns 1-1/2 to 2 inches (38 to 50 mm) high.
- E. Fertilization:
1. SEEDLINGS: Fertilize newly seeded areas with a 15-15-15 fertilizer grade two weeks after seeding. Fertilize at a rate of 293 lbs. per acre to supply 44 lbs N, P₂O₅ and K₂O per acre. Apply additional fertilizer applications after the 15-15-15 treatment using IBDU(31-0-0) at 4, 6 and 8 weeks after seeding at a rate of 142 lbs per acre.

F. Weed Control:

1. The Contractor is responsible for the control of weeds that establish into sodded and seeded areas during the maintenance period. The need for and method of weed control will be reviewed with and approved by the Engineer. Any approved Herbicide treatments shall be applied by a licensed State of Connecticut applicator.

G. Documentation

1. The Contractor is responsible for maintaining a log of maintenance activities performed as specified herein, including schedules and quantities of watering, repair, overseeding, fertilization, mowing, weed control activities and observations of seed and sod establishment. Copies of the Log shall be submitted to the Engineer weekly, except as noted for watering immediately after sod installation.

PART 2 - PRODUCTS

2.01 TOPSOIL

- A. Clean, fertile, friable, well-draining, natural sandy loam not containing materials harmful to plant life. All topsoil to be free of any subsoil, sod, stones over 1" in any dimension, sticks, roots, weeds, litter, and other deleterious material. Topsoil shall be uniform in quality and texture and contain organic matter and mineral elements necessary for sustaining healthy plant growth as follows:
 1. Organic content: 5% - 15%
 2. pH: 5.5 to 7
 3. Gradation: USDA Soils Textural Classification percentages of sand, silt, and clay for "Sandy Loam" or "Loam" classification.
 4. Nutrient Levels: As required by the additions of amendments to the topsoil to meet the optimum nutrient levels specified in the testing laboratory report.

2.02 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C602, agricultural limestone containing a minimum 80% calcium carbonate equivalent and as follows:
 1. Class: Class O, with a minimum 95% passing through the no. 8 (2.36 mm) sieve and a minimum 55% passing through the no. 60 (0.25 mm) sieve.
 2. Provide lime in form of dolomitic limestone.
- B. Aluminum Sulfate: commercial grade, unadulterated.
- C. Perlite: Horticultural perlite, soil amendment grade.
- D. Agricultural Gypsum: Finely ground, containing a minimum of 90% calcium sulfate.

- E. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.03 ORGANIC SOIL AMENDMENTS

- A. Compost: well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35% to 55% by weight; 100% passing through the $\frac{3}{4}$ " (19 mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5% inert contaminants and free of substances toxic to plantings.
- B. Peat: Finely divided or granular texture, pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water absorbing capacity of 1100% to 2000%.
- C. Manure: well-rotted, unleached, stable or cattle manure containing not more than 25% by volume of straw, sawdust, or other bedding materials; free of toxic substances, stone, sticks, soil, weed seed, and material harmful to plant growth.

2.04 SEED

- A. All seed materials shall be fully clearly labeled according to the Laws and regulations of the state of Connecticut. The Contractor shall retain and produce seed bag labels if requested by the Owner or Architect. An invoice from the seed supplier shall be included certifying that the seed are the cultivars as listed on the labels.
- B. Hydroseeding of slope and lawn areas may be permitted upon written approval of the Architect.
- C. Permanent Lawns & Turfgrass: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 1 percent weed seed:
 - 1. Standard Seed Mix: Proportioned by weight as follows:
 - a. 40 percent Kentucky bluegrass (*Poa pratensis*).
 - b. *40 percent chewings red fescue (*Festuca rubra* variety).
 - c. *20 percent perennial ryegrass (*Lolium perenne*).
 - * High endophyte
 - d. Ryegrass varieties shall be selected from varieties showing good wear tolerance and good disease resistance as listed in Rutgers University Cooperative Research & Extension Fact sheet FS546 'Perennial Ryegrass Varieties for New Jersey Sports Fields' James A. Murphy, PhD.
 - 2. Slope Lawn Seed Mix: Proportioned by weight. Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 1 percent weed seed:

- a. 80% equal mix of the following:
 - Sheeps Fescue,
 - Dawson Slender Red Fescue,
 - SR5210 Creeping Red Fescue,
 - SR 5100 Chewings Fescue,
 - Jasper Creeping Red Fescue,
 - Scaldis Hard Fescue,
 - SR 3150 Hard Fescue
 - b. 20% annual ryegrass
3. Low Maintenance Seed Mix: Proportioned by weight. Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 1 percent weed seed: Mix shall be sown at a minimum rate of 5lbs per 1,000sf.
- a. 42% 'Flyer' Creeping Red Fescue
 - b. 34% fiesta II perennial Ryegrass
 - c. 8% Redtop
 - d. 8% Birdsfoot trefoil
 - e. 8% Alsike Clover
- D. Temporary Vegetative Cover: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 1 percent weed seed:
1. Temporary Vegetative Cover: Proportioned by weight as follows:
 - a. 60 percent annual Ryegrass
 - b. 40 percent perennial Ryegrass.

2.05 ACCESSORIES

- A. Selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application as approved by the Engineer.

2.06 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade composite fertilizer uniform in composition, dry and free flowing. It shall bear the manufacturer's guaranteed statement of analysis which shall be as indicated by soils testing for original fertilization and 10-6-4 for refertilization with 50% organic nitrogen. Fertilizer shall be derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.06 MULCHES

- A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- B. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by seed operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.03 TOPSOIL PREPARATION AND SCREENING

- A. All stockpiled topsoil shall be screened prior to placement to meet the specified requirements.
- B. Limit lawn subgrade preparation to areas to be planted.
- C. Spread topsoil to the minimum depths indicted on the Contract Drawings but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if topsoil or subgrade is frozen, muddy, or excessively wet.
- D. Beginning of installation means Contractor acceptance of prepared site conditions
- E. General Seeded Areas:

1. Harrow or rake the topsoil to a depth of 3 inches. Remove all sticks, foreign material and stones 1 1/2 inches or greater in any dimension.
 2. Thoroughly blend planting soil mix before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix using a subsoiler.
 - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - b. Mix lime with dry soil before mixing fertilizer.
 3. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:
 - a. Remove existing grass, vegetation and turf. Do not mix into surface soil.
 - b. Loosen surface soil to a depth of at least of 6 inches (200 mm). Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches (150 mm) of soil. Till soil to a homogeneous mixture of fine texture.
 - c. Remove stones larger than 3/4 inch in any dimension and sticks, roots, trash, and other extraneous matter.
 - d. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.
 4. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation as measured with a 10' straight edge. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future.
 5. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- F. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.04 SEEDING

- A. Permanent Seed: Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
1. Do not use wet seed or seed that is moldy or otherwise damaged.
 2. Sow seed at the following rates:
 - a. Standard Seed Mix: 5 lbs/1,000 sq. ft.
 - b. Slope Lawn Seed Mix: 5 lbs/1,000 sq.ft.
 - c. Low Maintenance Seed Mix: 5 lb/1,000 sq. ft.
 3. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.

4. Protect seeded areas on slopes in accordance with Division 31 specification 'Erosion Control system'.
5. Apply straw mulch composed of stems of grain after threshing and free of weeds at 2 tons per acre on athletic field areas of the site.

B. Temporary Seeding: Sow seed with spreader, seeding machine or hydroseed.

1. Sow seed evenly at the rate of 10 lb/1000 sq.ft.

3.05 HYDROSEEDING

A. Hydroseeding: Only as approved by the Engineer

B. Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry application at a minimum rate of 500-lb/acre (5.1-kg/92.9 sq. m) dry weight but not less than the rate required to obtain specified seed-sowing rate. Apply slurry cover coat of fiber mulch at a rate of 1000 lb/acre (10.2 kg/92.9 sq. m).
3. Protect seeded areas with slopes exceeding 1:3 with slope stabilization blankets installed and stapled according to manufacturer's written instructions.

3.06 REPAIRS

- A. The Contractor shall reseed and repair any areas missed by seeding after proper restoration of the seedbed.
- B. The Contractor is responsible for repairing and reestablishing any areas damaged by erosion or settling during the maintenance period.

3.07 SATISFACTORY LAWNS

- A. Final acceptance of Lawn areas shall be based upon a uniform grass cover on the seeded areas and no settling occurring that would result in an uneven surface.
 1. Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m).
- B. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

3.08 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect barricades and warning signs as required protecting newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.
- C. Remove erosion-control measures after grass establishment period.

END OF SECTION 02900

GRINDER PUMP SYSTEMS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Section 02210 - Earth Excavation, Backfill, Fill and Grading
- B. Section 02610 – Low Pressure Force Main
- C. Liberty Pumps – Grinder Pump System Specifications
- D. Barnes Pumps – Grinder Pump System Specifications

1.02 SUMMARY

- A. This section includes grinder pump specifications to be installed between the house sewer and sewer force lateral for all residences in the project limits. **THIS SECTION IS NOT PART OF THE CONTRACT SCOPE OF WORK AND IS NOT TO BE INCLUDED IN THE CONTRACTOR'S BID. THIS SECTION IS FOR INFORMATIONAL PURPOSES ONLY TO THE HOMEOWNER. THIS INFORMATION ESTABLISHES THE SPECIFICATIONS FOR THE GRINDER PUMP SYSTEM TO BE USED FOR RESIDENCES IN THE PROJECT AREA WHEN CONNECTING TO THE MUNICIPAL SEWER SYSTEM.**

1.03 SUBMITTALS

- A. Submit product data and shop drawings for the following in accordance the Town of Branford Water Pollution Control Authority Requirements;
 - 1. Grinder pump
 - 2. Pump chamber
 - 3. Pump chamber piping, valves and fittings
- B. Product Certificates from Manufacturer

1.04 QUALITY ASSURANCE

- A. Materials and operations shall comply with the latest revision of all applicable Codes and Standards.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Observe manufacturer's directions for delivery and storage of material and accessories.

1.06 COORDINATION

- A. Coordinate tie-ins to municipal sewer mains with the Town of Branford.

PART 2 – PRODUCTS

2.01 - GRINDER PUMP

- A. – Liberty Pump – Omnivore LSGX2 Series 2- Stage High Head Centrifugal Grinder
- B. - Barnes Pump – OGP 2 Stage Recessed Vortex Centrifugal Grinder

2.02 – PIPE AND FITTINGS

2.02.1 PIPE

1. 1 ¼” diameter SDR 9 IPS (black color) or
2. 1 -1/2” diameter SDR 9 CTS (copper, blue color)
3. 1’ braided flex hose at pump chamber

2.02.2 FITTINGS

1. CTS fittings
2. Brass connection fittings
3. 3” brass nipple at curb valve
4. Anti-siphon valve integral with the grinder pump

2.03 - GRINDER TANK

A. Liberty Pumps 2484 series

1. 24” diameter
2. 84” deep
3. Fiberglass material
4. Fiberglass or steel cover
5. Anti-floatation collar
6. NEMA 4X Simplex control Panel
7. GR20 Guide Rail Base

B. Barnes Pumps

1. 24” diameter
2. 84” deep
3. Fiberglass Material
4. Polyethylene, fiberglass or steel cover
5. NEMA 6 control panel with cord grips
6. 300 Series Stainless Steel “C” Channel Rail Base

PART 3 - EXECUTION

3.01 - GRINDER PUMP INSTALLATION – GENERAL

3.01.1 Construction

- A. Systems shall be installed as shown on the drawings and in a neat and workmanlike manner using only new materials.
- B. Materials shall be clean and inspected prior to installation. No cracked, broken or defective material shall be used in the work.
- C. The interior surfaces of all piping and equipment shall be cleaned and free of all dirt, loose scale, rust and other foreign material before installation.

3.01.2 Testing

- A. All grinder pump systems shall be field tested prior to use.

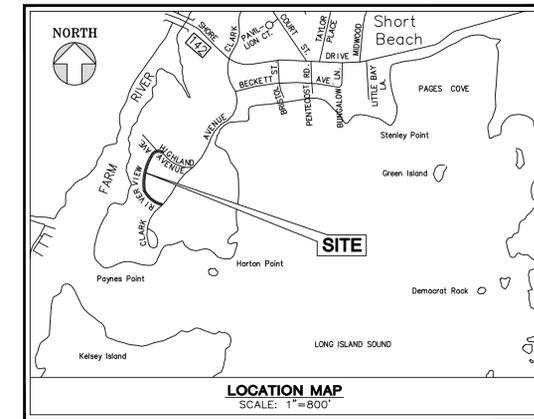
LOCAL SUPPLIERS

Construction Materials, Inc.
8 Massimo Drive
North Haven, CT 06473
203-287-1742

END OF SECTION

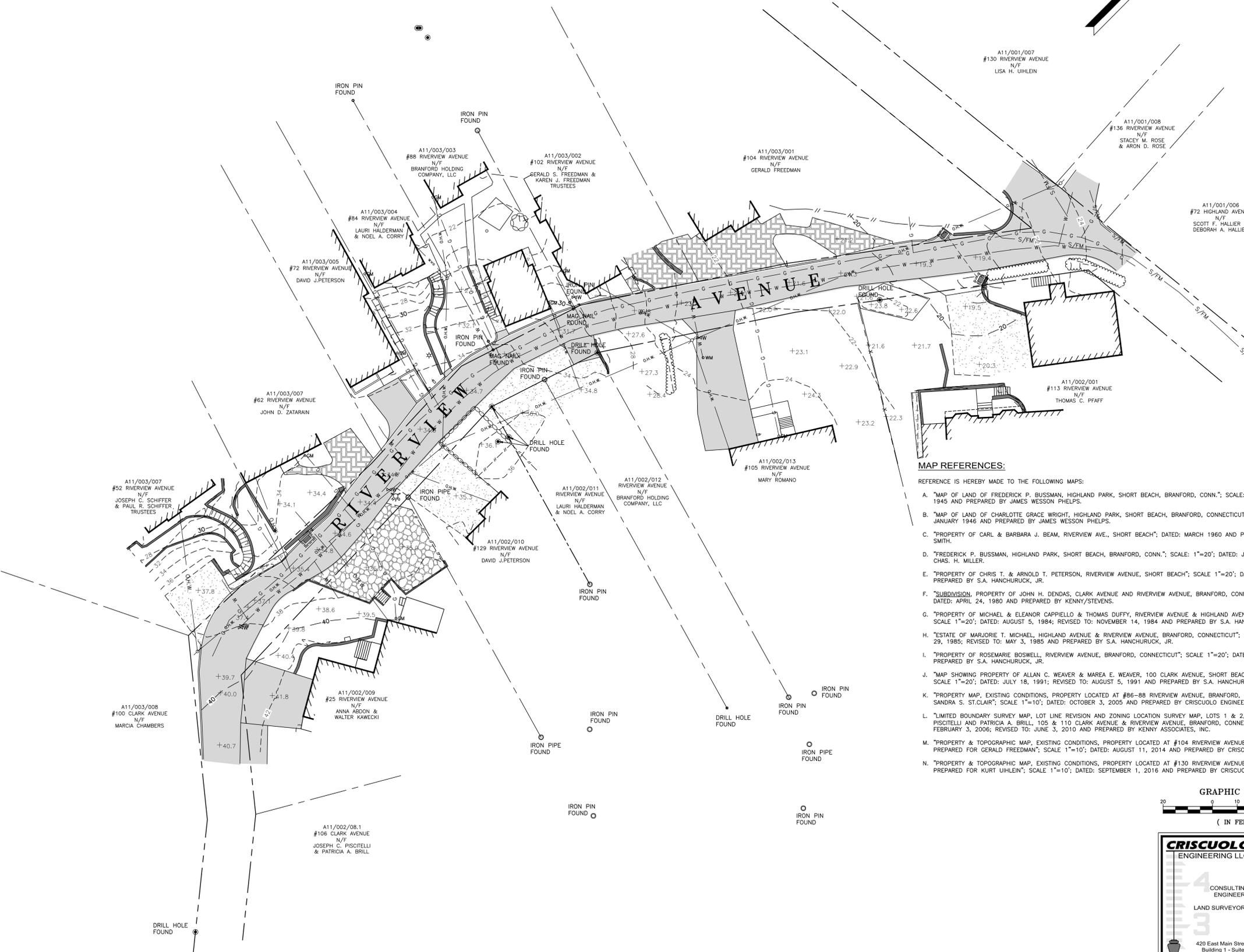
SURVEY NOTES:

1. THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300b-1 THRU 20-300b-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES - "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPT. 26, 1996 BEING A TOPOGRAPHIC SURVEY CONFORMING TO CLASS T-2 STANDARDS. SURVEY BASELINE CONFORMS TO HORIZONTAL ACCURACY CLASS A-2.
2. NORTH ARROW AND BEARINGS ARE BASED ON REFERENCE MAP 3A. ELEVATIONS ARE BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88). NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29). CONTOUR INTERVAL IS TWO FOOT.



SURVEY LEGEND

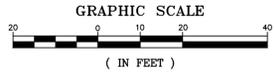
	Street Line
	Property Line
	Easement Line
	Curb
	Wood/Vinyl Fence
	Wire Fence
	Stone Wall
	Elevation Contour
	Spot Elevation
	Vegetation/Tree Line
	Deciduous Tree
	Coniferous Tree
	Catch Basin
	Manhole
	Utility Pole (With Guy)
	Water Valve/Meter Pit
	Over Head Wire
	Water Main/Service
	Sanitary Sewer
	Gas Line
	Stormwater Pipe <12" Diameter
	Stormwater Pipe ≥12" Diameter
	Ironpin Or Pipe Found
	Monument Found
	Drill Hole Found
	Nail Or Spike Found
	Assessor's Map/Block/Lot Number
	Lamp Post
	Mailbox



MAP REFERENCES:

- REFERENCE IS HEREBY MADE TO THE FOLLOWING MAPS:
- "MAP OF LAND OF FREDERICK P. BUSSMAN, HIGHLAND PARK, SHORT BEACH, BRANFORD, CONN."; SCALE: 1"=20'; DATED: MARCH 22, 1945 AND PREPARED BY JAMES WESSON PHELPS.
 - "MAP OF LAND OF CHARLOTTE GRACE WRIGHT, HIGHLAND PARK, SHORT BEACH, BRANFORD, CONNECTICUT"; SCALE: 1"=10'; DATED: JANUARY 1946 AND PREPARED BY JAMES WESSON PHELPS.
 - "PROPERTY OF CARL & BARBARA J. BEAM, RIVERVIEW AVE., SHORT BEACH"; DATED: MARCH 1960 AND PREPARED BY W. FLANDERS SMITH.
 - "FREDERICK P. BUSSMAN, HIGHLAND PARK, SHORT BEACH, BRANFORD, CONN."; SCALE: 1"=20'; DATED: JUNE 1966 AND PREPARED BY CHAS. H. MILLER.
 - "PROPERTY OF CHRIS T. & ARNOLD T. PETERSON, RIVERVIEW AVENUE, SHORT BEACH"; SCALE 1"=20'; DATED: SEPTEMBER 1976 AND PREPARED BY S.A. HANCHURUCK, JR.
 - "SUBDIVISION, PROPERTY OF JOHN H. DENDAS, CLARK AVENUE AND RIVERVIEW AVENUE, BRANFORD, CONNECTICUT"; SCALE 1"=20'; DATED: APRIL 24, 1980 AND PREPARED BY KENNY/STEVENS.
 - "PROPERTY OF MICHAEL & ELEANOR CAPPIELLO & THOMAS DUFFY, RIVERVIEW AVENUE & HIGHLAND AVENUE, BRANFORD, CONNECTICUT"; SCALE 1"=20'; DATED: AUGUST 5, 1984; REVISED TO: NOVEMBER 14, 1984 AND PREPARED BY S.A. HANCHURUCK, JR.
 - "ESTATE OF MARJORIE T. MICHAEL, HIGHLAND AVENUE & RIVERVIEW AVENUE, BRANFORD, CONNECTICUT"; SCALE 1"=20'; DATED: APRIL 29, 1985; REVISED TO: MAY 3, 1985 AND PREPARED BY S.A. HANCHURUCK, JR.
 - "PROPERTY OF ROSEMARIE BOSWELL, RIVERVIEW AVENUE, BRANFORD, CONNECTICUT"; SCALE 1"=20'; DATED: MAY 24, 1985 AND PREPARED BY S.A. HANCHURUCK, JR.
 - "MAP SHOWING PROPERTY OF ALLAN C. WEAVER & MAREA E. WEAVER, 100 CLARK AVENUE, SHORT BEACH, BRANFORD, CONNECTICUT"; SCALE 1"=20'; DATED: JULY 18, 1991; REVISED TO: AUGUST 5, 1991 AND PREPARED BY S.A. HANCHURUCK, JR.
 - "PROPERTY MAP, EXISTING CONDITIONS, PROPERTY LOCATED AT #86-88 RIVERVIEW AVENUE, BRANFORD, CONNECTICUT, PREPARED FOR SANDRA S. ST. CLAIR"; SCALE 1"=10'; DATED: OCTOBER 3, 2005 AND PREPARED BY CRISCUOLO ENGINEERING, LLC.
 - "LIMITED BOUNDARY SURVEY MAP, LOT LINE REVISION AND ZONING LOCATION SURVEY MAP, LOTS 1 & 2, PROPERTY OF JOSEPH PISCITELLI AND PATRICK A. BRILL, 105 & 110 CLARK AVENUE & RIVERVIEW AVENUE, BRANFORD, CONNECTICUT; SCALE 1"=10'; DATED: FEBRUARY 3, 2006; REVISED TO: JUNE 3, 2010 AND PREPARED BY KENNY ASSOCIATES, INC.
 - "PROPERTY & TOPOGRAPHIC MAP, EXISTING CONDITIONS, PROPERTY LOCATED AT #104 RIVERVIEW AVENUE, BRANFORD, CONNECTICUT, PREPARED FOR GERALD FREEDMAN"; SCALE 1"=10'; DATED: AUGUST 11, 2014 AND PREPARED BY CRISCUOLO ENGINEERING, LLC.
 - "PROPERTY & TOPOGRAPHIC MAP, EXISTING CONDITIONS, PROPERTY LOCATED AT #130 RIVERVIEW AVENUE, BRANFORD, CONNECTICUT, PREPARED FOR KURT UHLEIN"; SCALE 1"=10'; DATED: SEPTEMBER 1, 2016 AND PREPARED BY CRISCUOLO ENGINEERING, LLC.

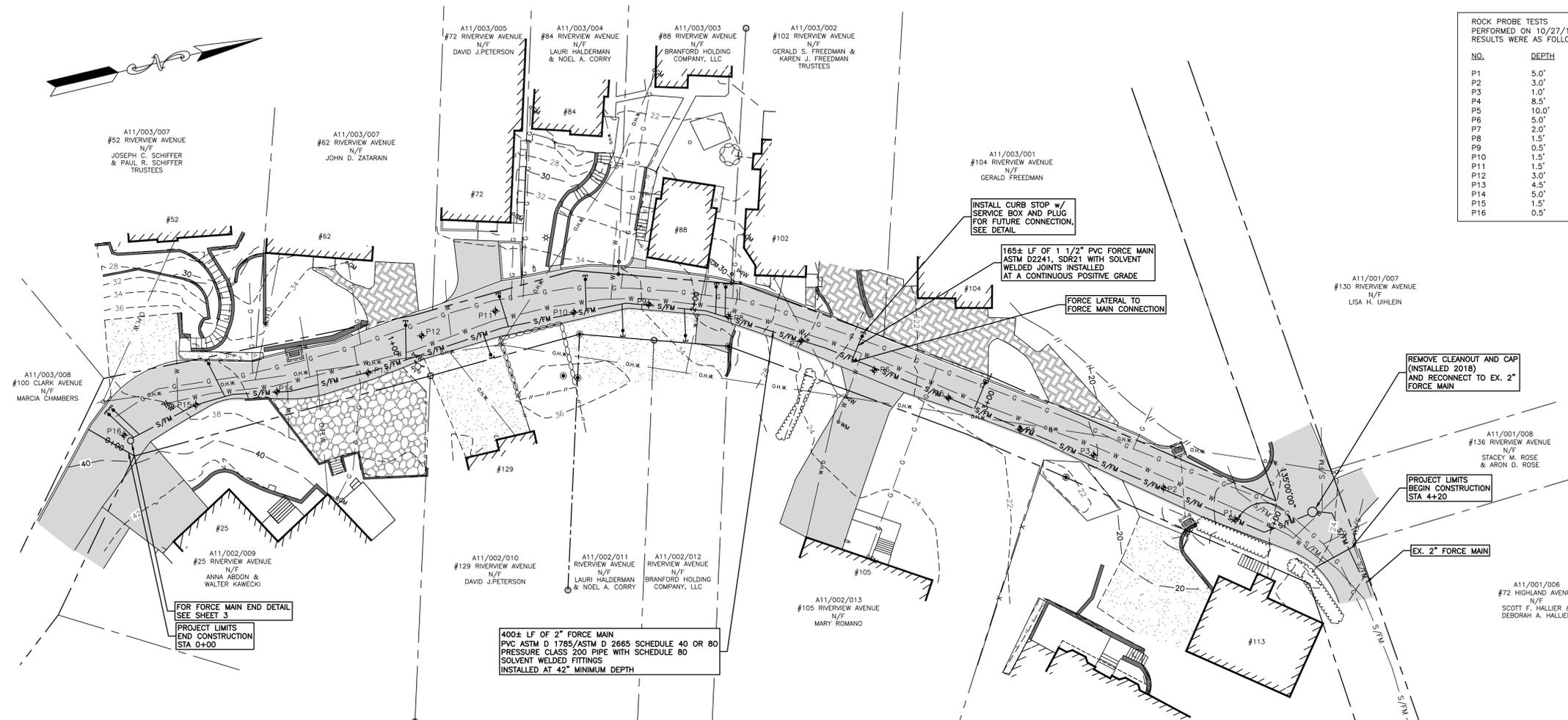
TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON



MARK D. BALLOU L.S. #70419
 JAMES M. PRETTI, JR. L.S. #22897
 THIS MAP NOT VALID WITHOUT LIVE SIGNATURE AND EMBOSSED SEAL OF THE LAND SURVEYOR NOTED ABOVE.

CRISCUOLO ENGINEERING LLC CONSULTING ENGINEERS LAND SURVEYORS 420 East Main Street Building 1 - Suite 9 Branford, CT 06405 TEL: 203/481-0807 FAX: 203/488-8729	JOB TITLE: RIVERVIEW AVENUE SHORT BEACH BRANFORD, CONNECTICUT
	PREPARED FOR: TOWN OF BRANFORD
REV. DATE: 7/31/19 DESCRIPTION: ISSUED FOR BID	DATE: 10/23/2017 DRAWING TITLE: EXISTING CONDITIONS PLAN
SCALE: 1"=20' DRAWN: C.A.F. CHECKED: M.D.B. JOB: 2017.070	DRAWING NO.: 1 OF 3 CADD FILE: 2017-070P08

2/20/2017 7:07:00 AM DWG:2017-070P08.dwg, 7/28/2019 12:15:10 PM



ROCK PROBE TESTS PERFORMED ON 10/27/17 RESULTS WERE AS FOLLOWS:

NO.	DEPTH
P1	5.0'
P2	3.0'
P3	1.0'
P4	8.5'
P5	10.0'
P6	5.0'
P7	2.0'
P8	1.5'
P9	0.5'
P10	1.5'
P11	1.5'
P12	3.0'
P13	4.5'
P14	5.0'
P15	1.5'
P16	0.5'

- GENERAL NOTES:**
- UTILITY LOCATIONS DEPICTED ON THE DRAWINGS HAVE BEEN COMPILED FROM UTILITY COMPANY MAPPING AND FIELD LOCATIONS OF ABOVE GROUND FACILITIES AND UTILITY COMPANY MARKOUTS. ALL LOCATIONS SHOWN SHOULD BE CONSIDERED APPROXIMATE ONLY AND ALL UTILITIES MAY NOT BE SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES AND FOR THE MAINTENANCE AND PROTECTION THEREOF. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" (1-800-922-4455) PRIOR TO THE START OF WORK TO ESTABLISH AND HAVE MARKED ON THE GROUND THE LOCATION OF ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN THE EVENT A UTILITY IS LOCATED OR IS UNCOVERED DURING THE PROGRESS OF THE WORK THAT WAS NOT INDICATED ON OR IS NOT IN ACCORDANCE WITH THE DRAWINGS.
 - THE CONTRACTOR SHALL ADHERE TO THE REGULATIONS AND STANDARDS OF THE TOWN OF BRANFORD, ALL APPLICABLE STATE AND FEDERAL REGULATORY AUTHORITIES, THE PROVISIONS OF THE CONTRACT DOCUMENTS, AND ANY APPROVALS AND/OR PERMITS ATTACHED THERETO.
 - UNLESS OTHERWISE NOTED, ALL WORK AND MATERIALS SHALL CONFORM TO THE "STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION FORM 817", DATED 2016, AND ALL SUPPLEMENTS THERETO.
 - THE INSTALLATION OF ALL PUBLIC UTILITIES SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE RESPECTIVE UTILITY COMPANIES. THE CONTRACTOR SHALL COORDINATE ALL WORK WITHIN THE RIVERVIEW AVENUE RIGHT OF WAY WITH THE RESPECTIVE UTILITY COMPANIES.
 - PRIOR TO THE START OF WORK, THE CONTRACTOR SHALL THOROUGHLY REVIEW THE CONTRACT DOCUMENTS AND THE SITE OF THE WORK AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS AND FEATURES. THE CONTRACTOR SHALL VERIFY ALL ELEVATIONS PRIOR TO THE START OF WORK. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE DRAWINGS AND EXISTING CONDITIONS AND FEATURES IN THE FIELD PRIOR TO THE START OF WORK.
 - THE CONTRACTOR SHALL CONFINE HIS OPERATIONS AND ACTIVITIES WITHIN THE PROJECT SITE PROPERTY LINES AND/OR THE CONTRACT LIMITS SHOWN ON THE DRAWINGS.
 - EXISTING CONDITIONS AND FEATURES SHALL BE MAINTAINED WHERE NEW CONSTRUCTION IS NOT SHOWN ON THE DRAWINGS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. EXISTING CONDITIONS AND FEATURES DISTURBED AS A RESULT OF THE CONTRACTOR'S OPERATIONS OR ACTIVITIES WHERE NEW CONSTRUCTION IS NOT SHOWN SHALL BE RESTORED TO ORIGINAL CONDITION UNLESS OTHERWISE SPECIFIED OR DIRECTED BY THE ENGINEER.
 - THE CONTRACTOR SHALL PROVIDE AND MAINTAIN EROSION AND SEDIMENT CONTROLS AS SHOWN ON THE DRAWINGS OR AS DIRECTED. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED.
 - SHOULD DEWATERING OF EXCAVATIONS, STRUCTURES, PIPELINES, ETC. BE REQUIRED, THE DISCHARGE FROM DEWATERING OPERATIONS SHALL BE DIRECTED TO A SETTLING AND/OR FILTER FACILITY CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND IN A LOCATION APPROVED BY THE ENGINEER.
 - IN THE EVENT OF A CONTAMINANT SPILL THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION OIL AND CHEMICAL SPILL DEPARTMENT (860-424-3338) AND THE TOWN OF BRANFORD.
 - DRAINAGE IMPROVEMENTS SHALL BE CONDUCTED DURING A DRY PERIOD OF TIME, ALL ACTIVITY SHALL BE SUSPENDED FOR 48 HOURS FOR STORM EVENTS OR 1" OF RAIN OR MORE WITHIN A 24 HOUR PERIOD.
 - JOB SITE SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. REVIEW OF THE CONSTRUCTION BY THE ENGINEER IS FOR CONFORMANCE WITH THE DESIGN ASPECTS ONLY, NOT TO REVIEW THE CONTRACTOR'S PROVISIONS FOR JOB SITE SAFETY. LACK OF COMMENT ON THE PART OF THE ENGINEER WITH REGARD TO THE JOB SITE IS NOT TO BE INTERPRETED AS APPROVAL OF JOB SITE SAFETY ASPECTS.

FOR FORCE MAIN END DETAIL SEE SHEET 3
PROJECT LIMITS END CONSTRUCTION STA 0+00

400± LF OF 2" FORCE MAIN
PVC ASTM D 1785/ASTM D 2865 SCHEDULE 40 OR 80
PRESSURE CLASS 200 PIPE WITH SCHEDULE 80
SOLVENT WELDED FITTINGS
INSTALLED AT 42" MINIMUM DEPTH

INSTALL CURB STOP W/
SERVICE BOX AND PLUG
FOR FUTURE CONNECTION,
SEE DETAIL

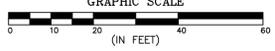
165± LF OF 1 1/2" PVC FORCE MAIN
ASTM D2241, SDR21 WITH SOLVENT
WELDED JOINTS INSTALLED
AT A CONTINUOUS POSITIVE GRADE

REMOVE CLEANOUT AND CAP
(INSTALLED 2018)
AND RECONNECT TO EX. 2" FORCE MAIN

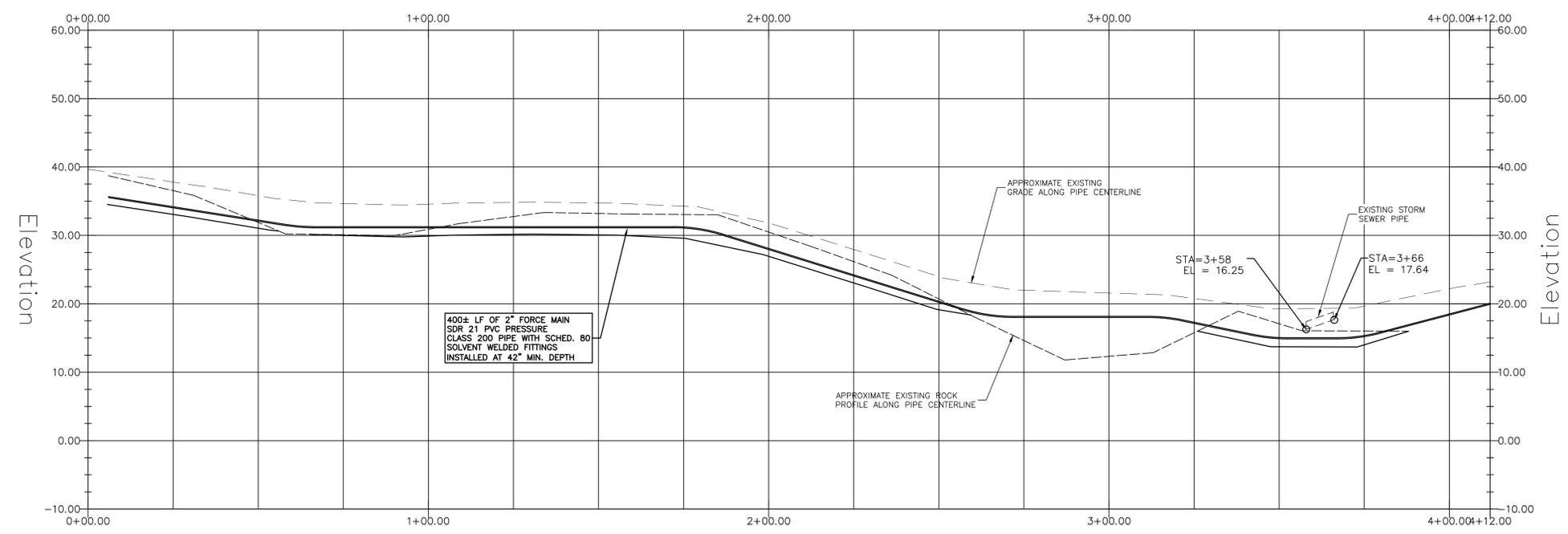
PROJECT LIMITS
BEGIN CONSTRUCTION
STA 4+20

EX. 2" FORCE MAIN

PLAN
1"=20'
GRAPHIC SCALE

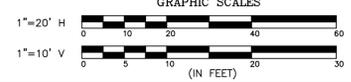


EXISTING		PROPOSED	
	Street Line		Street Line
	Property Line		Property Line
	Tie Line		Tie Line
	Easement Line		Easement Line
	Curb		Curb
	Wood Fence		Wood Fence
	Wire Fence		Wire Fence
	Stone Wall		Stone Wall
	Elevation Contour		Elevation Contour
	Spot Elevation		Spot Elevation
	Watercourse Line		Watercourse Line
	Inland Wetland Boundary		Inland Wetland Boundary
	Wetland Flag (Number)		Wetland Flag (Number)
	Vegetation Line		Vegetation Line
	Deciduous Tree		Deciduous Tree
	Coniferous Tree		Coniferous Tree
	Catch Basin		Catch Basin
	Manhole		Manhole
	Utility Pole (With Guy)		Utility Pole (With Guy)
	Water Valve/Meter Pit		Water Valve/Meter Pit
	Over Head Wire		Over Head Wire
	Water Main/Service		Water Main/Service
	Sanitary Lateral		Sanitary Lateral
	Sanitary Sewer		Sanitary Sewer
	Gas Line		Gas Line
	Roof Drain		Roof Drain
	Footing Drain		Footing Drain
	Stormwater Pipe <12" Diameter		Stormwater Pipe <12" Diameter
	Stormwater Pipe >12" Diameter		Stormwater Pipe >12" Diameter
	Grade To Drain		Grade To Drain
	Low Pressure Force Main		Low Pressure Force Main



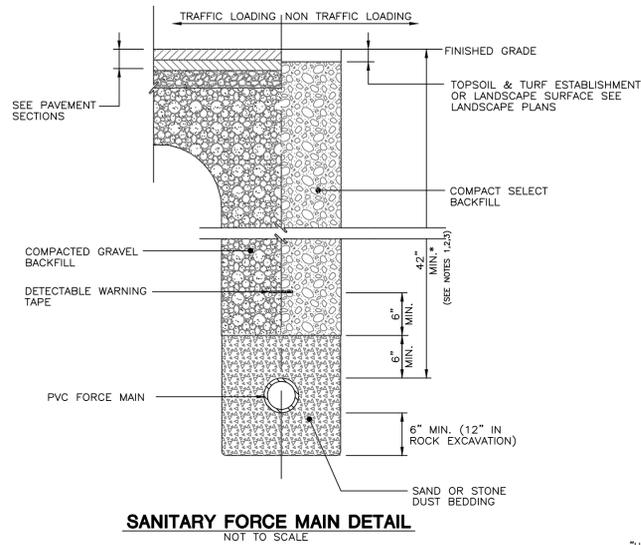
400± LF OF 2" FORCE MAIN
SDR 21 PVC PRESSURE
CLASS 200 PIPE WITH SCHED. 80
SOLVENT WELDED FITTINGS
INSTALLED AT 42" MIN. DEPTH

PROFILE
GRAPHIC SCALES



CRISCUOLO ENGINEERING LLC CONSULTING ENGINEERS LAND SURVEYORS 420 East Main Street Building 1 - Suite 9 Branford, CT 06405 TEL: 203/481-0807 FAX: 203/488-5729	7/31/19 ISSUED FOR BID 8/3/18 REVISE ALIGNMENT PER T.E. 7/17/18 TOWN COMMENTS REV. DATE: DESCRIPTION:	JOB TITLE: PROPERTY LOCATED AT RIVERVIEW AVENUE BRANFORD, CONNECTICUT PREPARED FOR: TOWN OF BRANFORD	DRAWING TITLE: PROPOSED LOW PRESSURE FORCE MAIN PLAN & PROFILE	DRAWING NO.: 2 OF 3	
	DATE: 10/10/17 SCALE: AS NOTED DRAWN: T.T.H. CHECKED: J.M.P. JOB: 2017.070	DATE: 10/10/17 SCALE: AS NOTED DRAWN: T.T.H. CHECKED: J.M.P. JOB: 2017.070	DRAWING TITLE: PROPOSED LOW PRESSURE FORCE MAIN PLAN & PROFILE	DRAWING NO.: 2 OF 3	CADD FILE: 2017-070P08

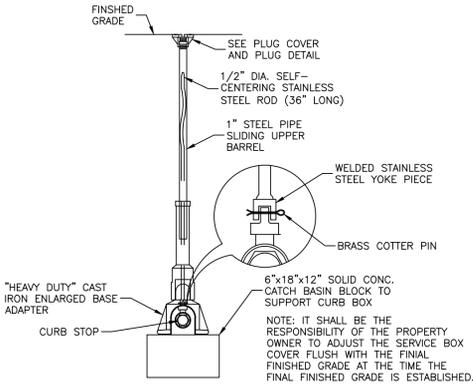
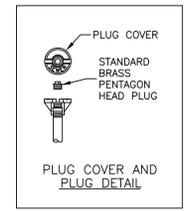
2:00170017-070P08.dwg, 7/28/2018 12:24:05 PM



SANITARY FORCE MAIN DETAIL
NOT TO SCALE

NOTES

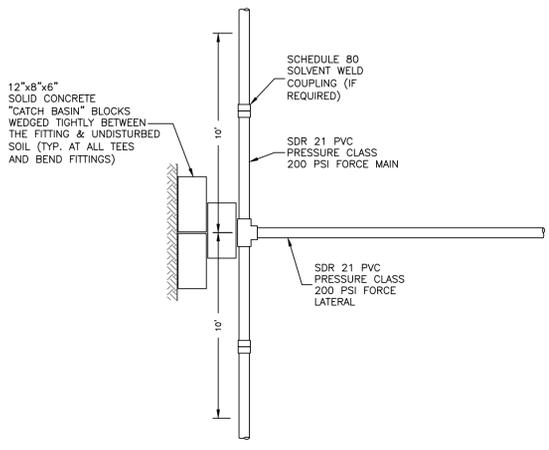
1. LOW PRESSURE FORCE MAIN SYSTEM TO BE CONSTRUCTED AT LEAST 10 FT HORIZONTALLY FROM WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
2. IF NOTE 1 CANNOT BE SATISFIED, THEN THE CROWN (TOP) OF THE LOW PRESSURE FORCE MAIN SYSTEM IS TO BE 18 INCHES BELOW THE BOTTOM (INVERT) OF THE WATER LINE.
3. IF THE DISTANCES IN NOTE 2 CANNOT BE SATISFIED, THE LOW PRESSURE FORCE MAIN SHALL BE CONSTRUCTED OF PVC ASTM D 1785/ASTM D 2665 SCHEDULE 40 OR 80. PIPE PRESSURE TESTED IN PLACE WITHOUT LEAKAGE PRIOR TO BACKFILLING. THE SEWER MANHOLE SHALL BE OF WATERTIGHT CONSTRUCTION AND TESTED IN PLACE.
4. TEST BORINGS TO BE CONDUCTED ALONG LENGTH OF WATER MAIN TO DETERMINE ITS DEPTH PRIOR TO INSTALLING LOW PRESSURE FORCE MAIN.



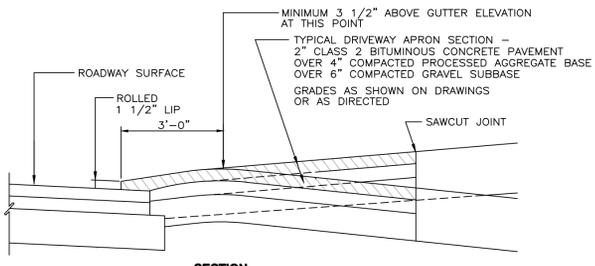
'ERIE' STYLE SERVICE BOX FOR SEWER FORCE LATERALS
NOT TO SCALE

NOTES:

1. SERVICE BOXES SHALL BE "ERIE" STYLE, CAST IRON ARCH PATTERN BASE, 1" INSIDE DIA. STEEL UPPER BARREL, ADJUSTABLE FROM 4-5 FEET. BIBBY-STE. CROIX MODEL U150 OR APPROVED EQUAL.
2. PLUG COVERS SHALL BE THREAD-ON TYPE, CAST IRON, MARKED "SEWER", BIBBY-STE. CROIX MODEL U403 OR APPROVED EQUAL.
3. ENLARGE BASE ADAPTER SHALL BE BIBBY-STE. CROIX MODEL V313 OR APPROVED EQUAL.
4. STAINLESS STEEL RODS SHALL BE 1/2" DIA. x 36" LONG WITH WELDED STEEL YOKE PIECES, BIBBY-STE. CROIX MODEL US36 OR APPROVED EQUAL.



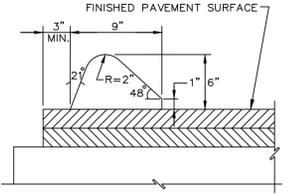
FORCE LATERAL INSTALLATION CONNECTION TO FORCE MAIN
NOT TO SCALE



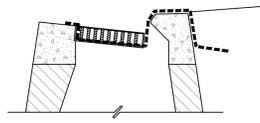
BITUMINOUS CONCRETE DRIVEWAY APRON
NOT TO SCALE

NOTES:

1. WIDTH OF DRIVEWAY APRON TO BE 10 FEET WHEN SERVING ONE LOT AND 16 FEET WIDE WHEN SERVING MORE THAN ONE LOT.
2. DRIVEWAY APRONS WIDTH SHALL MATCH EXISTING DRIVEWAYS WIDTHS.
3. DRIVEWAY APRONS SHALL BE PAVED A MINIMUM OF 10 FEET BACK FROM STREET EDGE.

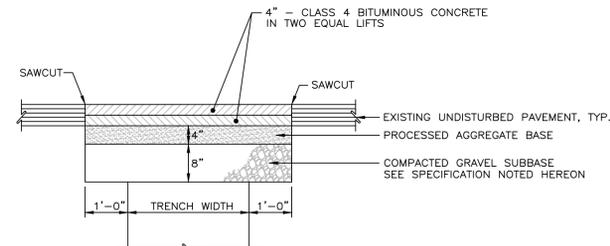


BITUMINOUS CONCRETE LIP CURBING
NOT TO SCALE



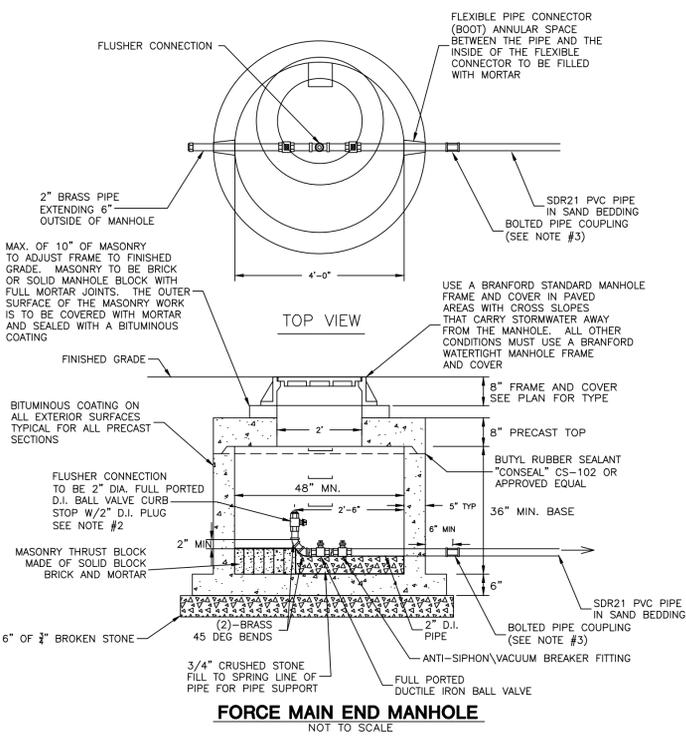
SEDIMENT CONTROL AT CATCH BASIN
NOT TO SCALE

1. WRAP FILTER FABRIC AROUND GRATE AND PLACE IN FRAME.
2. EXTEND FABRIC BEHIND CATCH BASIN TOP AND BACKFILL.
3. INSPECT CATCH BASINS AFTER EACH STORM EVENT.
4. REMOVE ACCUMULATED SEDIMENT AS REQUIRED.



TOWN OF BRANFORD TEMPORARY PAVEMENT REPAIR
NOT TO SCALE

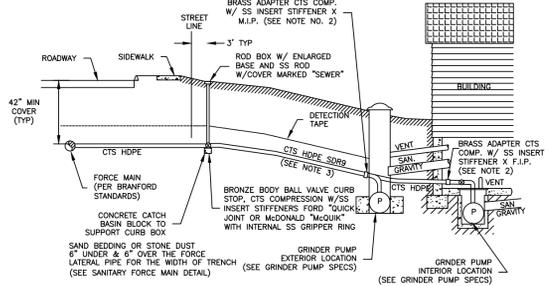
CLEAN ALL SAWCUT SURFACES OF EXISTING PAVEMENT AND APPLY ASPHALT EMULSION JUST PRIOR TO PLACEMENT OF NEW PAVEMENT



FORCE MAIN END MANHOLE
NOT TO SCALE

NOTES:

1. PVC FORCE MAINS SHALL BE SDR 21 WITH A 200 PSI PRESSURE RATING CONFORMING TO ASTM D2241 EXTRUDED FROM CLEAN, VIRGIN APPROVED CLASS 12454-A PVC RESIN COMPOUND CONFORMING TO ASTM D1784. JOINTS SHALL BE RUBBER GASKET CONFORMING TO ASTM D1869 AND F477.
2. 2" MAINS: BRONZE BODY BALL VALVE CURB STOP, FIPXIF FORD B11-777 OR McDONALD 6015. 2 1/2" & 3" MAINS: BRONZE BODY VALVES WITH A PRESSURE RATING OF 400 PSI. BRANFORD WPCA APPROVAL REQUIRED.
3. BOLTED COUPLINGS SHALL BE CAST DUCTILE IRON ROMAC STYLE 501, ICM NO. 211, FORD STYLE FC1 OR FC2A OR APPROVED EQUAL WITH GASKETS TO MATCH O.D. OF PIPE.



FORCE LATERAL INSTALLATION (CONNECTION TO FORCE MAIN)
NOT TO SCALE

NOTES:

1. HIGH DENSITY POLYETHYLENE FORCE SEWER LATERALS SHALL BE COPPER TUBE SIZE (CTS) HOPE SDR 9 AND SHALL HAVE A WORKING PRESSURE RATING OF 200 PSI AND SHALL CONFORM TO ANSA C901, ASTM D3350 AND ASTM D2737.
2. BRASS ADAPTERS SHALL BE CTS COMPRESSION WITH STAINLESS STEEL INSERT STIFFENER X M.I.P. OR F.I.P. COMPRESSION END SHALL BE FORD "QUICK JOINT" OR McDONALD "McQUICK" WITH INTERNAL STAINLESS STEEL GRIPPER RING.
3. THE OWNER'S ENGINEER SHALL SIZE THE FORCE LATERAL MAIN AND GRINDER PUMP AND SUBMIT THE CALCULATIONS AND PUMP INSTALLATION CUT SHEETS TO THE SEWER DIVISION FOR REVIEW AND APPROVAL. THE MINIMUM SIZE FOR ALL FORCE LATERALS SHALL BE 1-1/2" DIAMETER. THE MINIMUM SIZE FOR ALL FORCE MAINS SHALL BE 2" DIAMETER.
4. GRINDER PUMPS MAY BE USED FOR SINGLE FAMILY RESIDENTIAL HOUSES ONLY.

FORCE MAIN LATERAL CONNECTION DETAIL
N.T.S.

CRISCUOLO ENGINEERING LLC		JOB TITLE:	
CONSULTING ENGINEERS		PROPERTY LOCATED AT RIVERVIEW AVENUE BRANFORD, CONNECTICUT	
7/31/19	ISSUED FOR BID	PREPARED FOR:	
7/17/18	TOWN COMMENTS	TOWN OF BRANFORD	
LAND SURVEYORS	REV. DATE: DESCRIPTION:	DATE: 10/10/17	DRAWING TITLE:
		SCALE: N.T.S.	DRAWING NO.:
		DRAWN: J.M.P.	3 OF 3
		CHECKED: R.A.C.	
		JOB: 2017.070	
420 East Main Street Building 1 - Suite 9 Branford, CT 06405 TEL: 203/481-0807 FAX: 203/488-8729		CADD FILE: 2017-070P08	

2/20/2017 7:07:00 AM DWG:2017-070P08.dwg, 1/28/2019 12:30:07 PM