

**DOROTHEA DIX PSYCHIATRIC CENTER
STORMWATER UTILITY IMPROVEMENTS**

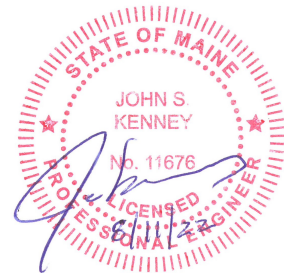
**CONTRACT DOCUMENTS
AND
TECHNICAL SPECIFICATIONS**

August 11, 2022

227953

CONSTRUCTION DOCUMENTS

**DuBois
& King^{INC.}**



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00 11 13
Notice to Contractors

DDPC Stormwater Utility Improvements

BGS Project No. 3431

Remove and replace two (2) catch basins, storm drain and culverts on the Dorothea Dix Psychiatric Center campus in Bangor, Maine

The cost of the work is approximately \$ 134,000. The work to be performed under this contract shall be completed on or before the Final Completion date of *31 December 2022*.

1. Bids shall be submitted in sealed envelopes plainly marked "**Bid for DDPC Stormwater Utility Improvements**" and addressed to the Bid Administrator:

Mark Faulkner, Director of Facilities
DDPC
656 State Street
Bangor, ME 04401

The envelope shall contain a completed Contractor Bid Form, plus bid security when required, to be received no later than **2:00:00 p.m.** on **August 25, 2022**. Bid submissions will be opened and read aloud at *the address shown above* at the time and date noted above.

Any bid submitted after the noted time will not be considered a valid bid and will remain unopened. Any bid submitted by any other means will not be considered a valid bid.

2. The bid shall be submitted on the Contractor Bid Form (section 00 41 13) provided in the Bid Documents. The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.
3. Bid security *is required* on this project.
If noted above as required, the Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with the completed bid form submitted to the Owner. The Bid Bond form is available on the BGS website.
4. Performance and Payment Bonds *are required* on this project.
If noted above as required, or if any combination of Base Bid and Alternate Bids amounts selected in the award of the contract exceeds \$125,000.00, the selected Contractor shall furnish a 100% contract Performance Bond (section 00 61 13.13) and a 100% contract Payment Bond (section 00 61 13.16) in the contract amount to cover the execution of the Work. Bond forms are available on the BGS website.
5. Filed Sub-bids *are not required* on this project.
6. There *are no* Pre-qualified General Contractors on this project.
If Pre-qualified General Contractors are identified for this project, the name of each company, with their city and state, are listed below.

00 11 13
Notice to Contractors

7. An on-site pre-bid conference *will not* be conducted for this project.
If a pre-bid conference is scheduled, it is *<Bid Administrator to select...>* for General Contractors and optional for Subcontractors and suppliers. Contractors who arrive late or leave early for a mandatory meeting may be prohibited from participating in this meeting and bidding. .

8. Bid Documents - full sets only - will be available on or about *August 15, 2022* and may be obtained from:
Print Bangor
8 Central Street
Bangor, ME 04401
Electronic contract documents (PDFs) can be obtained at no cost from DuBois & King Inc. at
www.dubois-king.com/projects-bidding-activ

9. Bid Documents may be examined at:

<i>AGC Maine</i>	<i>Construction Summary</i>
<i>188 Whitten Road</i>	<i>734 Chestnut Street</i>
<i>Augusta, ME 04330</i>	<i>Manchester, NH 03104</i>
<i>Phone 207-622-4741 Fax 207-622-1625</i>	<i>Phone 603-627-8856 Fax 603-627-4524</i>

00 21 13
Instructions to Bidders

1. Bidder Requirements

- 1.1 A bidder is a Contractor who is qualified, or has been specifically pre-qualified by the Bureau of General Services, to bid on the proposed project described in the Bid Documents.
- 1.2 Contractors and Subcontractors bidding on projects that utilize Filed Sub-bids shall follow the requirements outlined in these Bid Documents for such projects. See Section 00 22 13 for additional information.
- 1.3 Contractors and Subcontractors are not eligible to bid on the project when their access to project design documents prior to the bid period distribution of documents creates an unfair bidding advantage. Prohibited access includes consultation with the Owner or with design professionals engaged by the Owner regarding cost estimating, constructability review, or project scheduling. This prohibition to bid applies to open, competitive bidding or pre-qualified contractor bidding or Filed Sub-bidding. The Bureau may require additional information to determine if the activities of a Contractor constitute an unfair bidding advantage.
- 1.4 Each bidder is responsible for becoming thoroughly familiar with the Bid Documents prior to submitting a bid. The failure of a bidder to review evident site conditions, to attend available pre-bid conferences, or to receive, examine, or act on addenda to the Bid Documents shall not relieve that bidder from any obligation with respect to their bid or the execution of the work as a Contractor.
- 1.5 Prior to the award of the contract, General Contractor bidders or Filed Sub-bidders may be required to provide documented evidence to the Owner or the Bureau showing compliance with the provisions of this section, their business experience, financial capability, or performance on previous projects.
- 1.6 The selected General Contractor bidder will be required to provide proof of insurance before a contract can be executed.
- 1.7 Contracts developed from this bid shall not be assigned, sublet or transferred without the written consent of the Owner.
- 1.8 By submitting a bid the Contractor attests that it has not been declared ineligible to bid on State of Maine projects. The Director of the Bureau of General Services may disallow award of this contract to any Contractor if there is evidence that the Contractor or any of its Subcontractors, through their own fault, have been terminated, suspended for cause, debarred from bidding, agreed to refrain from bidding as part of a settlement, have defaulted on a contract, or had a contract completed by another party.
- 1.9 The Contractor attests that it is not presently indicted for or otherwise criminally or civilly charged by a Federal, State or local government entity with commission of any of the following offenses and has not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction, or contract under a public transaction, violation of Federal or State anti-trust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

00 21 13
Instructions to Bidders

- 1.10 The Contractor shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs or State of Maine projects.

2. Authority of Owner
 - 2.1 The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.

 - 2.2 Subject to the Owner's stated right to accept or reject any or all bids, the Contractor shall be selected on the basis of the lowest dollar value of an acceptable Base Bid, or any combination of Base Bid plus Alternate Bids, as well as other limited cost modifications the Owner determines may best serve the interests of the Owner. An acceptable bid is a duly submitted bid from a responsive and responsible bidder.

 - 2.3 The Owner reserves the right to require Bid Bonds or Performance and Payment Bonds for any project of any contract value.

3. Submitting Bids and Bid Requirements
 - 3.1 Each bid shall be submitted on the forms provided in the Bid Documents.

 - 3.2 Each bid shall be valid for a period of thirty calendar days following the Project bid closing date and time. The bid expiration date may be extended in unusual circumstances by mutual consent of the Bidder and the Owner. The bid amount shall not be modified due to the bid expiration date extension.

 - 3.3 Any provision contained in a bid which shows cost escalation, or any modification of schedule or other requirements shall not be accepted. Such a provision causes the bid to be invalid, or, at the discretion of the Owner and BGS, that element of the bid submission may be disregarded for the purpose of awarding the contract without that provision.

 - 3.4 Bidders shall include a Bid Bond or other approved bid security with the bid form submitted to the Owner when the bid form indicates such bid security is required. The bond value shall be 5% of the bid amount. The form of bond is shown in section 00 43 13.

 - 3.5 Bidders recognize that inclusion of contract bonds and the cost of those bonds is dependent on the awarded contract dollar value. Therefore, a Base Bid, or any combination of Base Bid plus Alternate Bids, as well as other limited cost modifications, resulting in a contract award shall include the cost of Performance and Payment Bonds in the submitted bid amount when the construction contract value is over \$125,000.00. Similarly, the cost of Performance and Payment Bonds is excluded in the submitted bid amount when the construction contract value is \$125,000.00 or less unless bonds are specifically required by the Bid Documents. When required for the project, the selected Contractor shall provide these bonds before a contract can be executed, pursuant to 14 M.R.S.A., Section 871, Public Works Contractors' Surety Bond Law of 1971, subsection 3. The form of bonds is shown in section 00 61 13.13 and 00 61 13.16.

00 21 13
Instructions to Bidders

- 3.6 Bidders may modify bids in writing, by the same means as the original bid submission, prior to the bid closing time. Such written amendments shall not disclose the amount of the initial bid. If so disclosed, the entire bid is considered invalid.
- 3.7 Bidders implicitly acknowledge all Addenda issued when they submit the bid form. By usual practice the Consultant shall not issue Addenda less than 72 hours prior to the bid closing time, to allow ample time for bidders to incorporate the information. However, some information, such as extending the bid due date and time, may be issued with shorter notice. Addenda shall be issued to all companies who are registered holders of Bid Documents.
- 3.8 A bid may be withdrawn without penalty if a written request by the bidder is presented to the Owner prior to the bid closing time. Such written withdrawal requests are subject to verification as required by the Bureau. After the bid closing time, such written withdrawal requests may be allowed in consideration of the bid bond or, without utilizing a bid bond, if the Contractor provides documented evidence to the satisfaction of the Bureau that factual errors had been made on the bid form.
- 3.9 In the event State of Maine Offices unexpectedly close on the published date of a public bid opening in the location of that bid opening, prior to the time of the scheduled deadline, the new deadline for the public bid opening will be the following business day at the originally scheduled hour of the day, at the original location. Official closings are posted on the State of Maine government website.
- 3.10 The Owner may require, in a Notice of Intent to Award letter to the apparent low bidder, a Schedule of Values, Project Schedule, and List of Subcontractors and Suppliers as both a demonstration of capability of the Bidder and as a condition of award.
- 3.11 Projects which require a State of Maine wage determination will include that schedule as part of the Bid Documents. See section 00 73 46, if such rates are required.
- 3.12 Projects which require compliance with the Davis-Bacon Act are subject to the regulations contained the Code for Federal Regulations and the federal wage determination which is made a part of the Bid Documents. See section 00 73 46, if such rates are required.
- 3.13 The Owner is exempt from the payment of Maine State sales and use taxes as provided in 36 M.R.S. §1760 (1). The Contractor and Subcontractors shall not include taxes on exempt items in the construction contract.

**00 41 13
Contractor Bid Form**

DDPC Stormwater Utility Improvements

BGS project number

Bid Form submitted by: *email only to email address below*

Bid Administrator:

Jill Instasi
Bureau of General Services
111 Sewall Street, Cross State Office Building, 4th floor
77 State House Station
Augusta, Maine 04333-0077

BGS.Architect@Maine.gov

Bidder:

Signature: _____

Printed name and title: _____

Company name: _____

Mailing address: _____

City, state, zip code: _____

Phone number: _____

Email address: _____

State of incorporation, if a corporation: _____

List of all partners, if a partnership: _____

The Bidder agrees, if the Owner offers to award the contract, to provide any and all bonds and certificates of insurance, as well as Schedule of Values, Project Schedule, and List of Subcontractors and Suppliers if required by the Owner, and to sign the designated Construction Contract within twelve calendar days after the date of notification of such acceptance, except if the twelfth day falls on a State of Maine government holiday or other closure day, or a Saturday, or a Sunday, in which case the aforementioned documents must be received before 12:00 noon on the first available business day following the holiday, other closure day, Saturday, or Sunday.

As a guarantee thereof, the Bidder submits, together with this bid, a bid bond or other acceptable instrument as and if required by the Bid Documents.

**00 41 13
Contractor Bid Form**

- 1. The Bidder, having carefully examined the *DDPC Stormwater Utility Improvements* Project Manual dated August 10, 2022, prepared by DuBois & King Inc., as well as Specifications, Drawings, and any Addenda, the form of contract, and the premises and conditions relating to the work, proposes to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this project for the **Base Bid** amount of:

\$ _____ .00

- 2. Allowances *are not included* on this project.
No Allowances

\$ 0.00

- 3. Alternate Bids *are not included* on this project.
No Alternate Bids

Any dollar amount line below that is left blank by the Bidder shall be read as a bid of **\$0.00**.

1 not used \$ _____ .00

2 not used \$ _____ .00

3 not used \$ _____ .00

4 not used \$ _____ .00

- 4. Bid security *is required* on this project.
If noted above as required, or if the Base Bid amount exceeds \$125,000.00, the Bidder shall include with this bid form a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with this completed bid form submitted to the Owner.

- 5. Filed Sub-bids *are not required* on this project.
If noted above as required, the Bidder shall include with this bid form a list of each Filed Sub-bidder selected by the Bidder on the form provided (section 00 41 13F).

**00 43 13
Contractor Bid Bond**

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto select title of obligee in the penal sum of five percent of the bid amount, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns, signed this insert date, i.e.: 8th day of select month, select year, which is the same date as that of the first specified bid due date, or subsequent bid due date revised by addendum.

The condition of the above obligation is such that whereas the principal has submitted to the Owner, or State of Maine, to a certain bid, attached hereto and hereby made a part hereof, to enter into a contract in writing, for the construction of insert name of project as designated in the contract documents

Now therefore:

If said bid shall be rejected, or, in the alternate,

If said bid shall be accepted and the principal shall execute and deliver a contract in the form of contract attached hereto, properly completed in accordance with said bid, and shall furnish a bond for the faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time within which the Obligee may accept such bid and said Surety does hereby waive notice of any such extension.

**00 43 13
Contractor Bid Bond**

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this insert date, i.e.: 8th day of select month, select year, which is the first specified bid due date, or subsequent bid due date revised by addendum.

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

State of Maine
CONSTRUCTION CONTRACT

Large Construction Project

*This form is used when the Contract value is \$50,000 or greater.
The Project Manual, Specifications and Drawings, and any Addenda are considered part of this Contract.*

Agreement entered into by and between the insert contracting entity name hereinafter called the **Owner** and insert Contractor company name hereinafter called the **Contractor**.

BGS Project No.: insert number assigned by BGS Other Project No.: _____

For the following Project: title of project shown on documents at facility or campus name, municipality, Maine.

The Specifications and the Drawings have been prepared by firm name, acting as Professional-of-Record and named in the documents as the Consultant Architect or Engineer.

The *Owner* and *Contractor* agree as follows:

ARTICLE 1 COMPENSATION AND PAYMENTS

1.1 The Owner shall pay the Contractor to furnish all labor, equipment, materials and incidentals necessary for the construction of the Work described in the Specifications and shown on the Drawings the Contract Amount as shown below.

Base Bid	\$0.00
<u>Alternate Bid number and name or "no Alternates"</u>	\$0.00
<u>Alternate Bid number and name or "no Alternates"</u>	\$0.00
<u>Alternate Bid number and name or "no Alternates"</u>	\$0.00
<u>Alternate Bid number and name or "no Alternates"</u>	\$0.00
<u>Alternate Bid number and name or "no Alternates"</u>	\$0.00
Total Contract Amount	\$0.00

1.2 The Contractor’s requisition shall contain sufficient detail and supporting information for the Owner to evaluate and support the payment requested.

1.2.1 Payments are due and payable twenty-five working days from the date of receipt of a Contractor requisition which is approved by the Owner.

1.2.2 Provisions for late payments are governed by 5 M.R.S. Chapter 144, *Payment of Invoices Received from Business Concerns*, and interest shall be calculated at 1% per month.

ARTICLE 2 COMMENCEMENT AND COMPLETION DATES

2.1 The Work of this Contract shall commence no sooner than the date this document is executed by the approval authority, or a subsequent date designated in the contract documents.

2.2 The Substantial Completion Date shall be 15 December 2023.

2.3 The Work of this Contract shall be completed on or before the Contract Final Completion Date of **31 December 2023**.

2.4 The Contract Expiration Date shall be **29 February 2024**. (This date is the Owner's deadline for internal management of contract accounts. The Contract Expiration Date does not directly relate to any contract obligation of the Contractor.)

ARTICLE 3 INELIGIBLE BIDDER

3.1 By signing this contract the Contractor attests that it has not been declared ineligible to bid on State of Maine projects. The Bureau of General Services may disallow award of this contract to any Contractor if there is evidence that the Contractor or any of its Subcontractors, through their own fault, have been terminated, suspended for cause, debarred from bidding, agreed to refrain from bidding as part of a settlement, have defaulted on a contract, or had a contract completed by another party.

3.2 By signing this contract the Contractor attests that it is not presently indicted for or otherwise criminally or civilly charged by a Federal, State or local government entity with commission of any of the following offenses and has not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction, or contract under a public transaction, violation of Federal or State anti-trust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

3.3 The Contractor shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs or State of Maine projects.

ARTICLE 4 CONTRACTOR'S RESPONSIBILITIES

4.1 On this project, the Contractor **shall** furnish the Owner the appropriate contract bonds in the amount of 100% of the Contract Sum. Contract bonds are mandated if the Contract Sum exceeds \$125,000, or if bonds are specifically required by the Contract Documents.

4.2 The Contractor shall comply with all laws, codes and regulations applicable to the Work.

4.3 The Contractor shall acquire all permits and third-party approvals applicable to the Work not specifically identified as provided by the Owner. Costs for Contractor-provided permits and third-party approvals shall be included in the Contract Sum identified in Section 1.1 above.

4.4 The Contractor shall remain an independent agent for the duration of this Contract, shall not become an employee of the State of Maine, and shall assure that no State employee will be compensated by, or otherwise benefit from, this Contract.

4.5 The Contractor shall be responsible for any design cost, construction cost, or other cost incurred on the Project to the extent caused by the negligent acts, errors or omissions of the Contractor or their Subcontractors in the performance of Work under this Contract.

ARTICLE 5 OWNER'S RESPONSIBILITIES

5.1 The Owner shall provide full information about the objectives, schedule, constraints and existing conditions of the project. The Owner has established a budget with reasonable contingencies that meets the project requirements.

5.2 By signing this contract, the Owner attests that all State of Maine procurement requirements for this contract have been met, including the solicitation of competitive bids.

ARTICLE 6 INSTRUMENTS OF SERVICE

6.1 The Contractor's use of the drawings, specifications and other documents known as the Consultant's Instruments of Service is limited to the execution of the Contractor's scope of work of this project unless the Contractor receives the written consent of the Owner and Consultant for use elsewhere.

ARTICLE 7 MISCELLANEOUS PROVISIONS

7.1 This Contract shall be governed by the laws of the State of Maine.

7.2 The Owner and Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to this Contract. Neither party to this Contract shall assign the Contract as a whole without written consent of the other party, which consent the Owner may withhold without cause.

7.3 Notwithstanding any other provision of this Agreement, if the Owner does not receive sufficient funds to fund this Agreement or funds are de-appropriated, or if the Owner does not receive legal authority from the Maine State Legislature or Maine Courts to expend funds intended for this Agreement, then the Owner is not obligated to make payment under this Agreement; provided, however, the Owner shall be obligated to pay for services satisfactorily performed prior to any such non-appropriation in accordance with the termination provisions of this Agreement. The Owner shall timely notify the Contractor of any non-appropriation and the effective date of the non-appropriation.

ARTICLE 8 CONTRACT DOCUMENTS

8.1 The Project Manual, Specifications and Drawings, and any Addenda, together with this agreement, form the contract. Each element is as fully a part of the Contract as if hereto attached or herein repeated.

8.2 Specifications: **indicate date of issuance of project manual**

8.3 Drawings: **note each sheet number and title**

8.4 Addenda: **note each addenda number and date, or "none"**

BGS Project No.: _____

The Contract is effective as of the date executed by the approval authority.

OWNER

CONTRACTOR

Signature *Date*
name and title

Signature *Date*
name and title

name of contracting entity
address

name of contractor company
address

telephone
email address

telephone
email address
Vendor Number

Indicate the names of the review and approval individuals appropriate to the approval authority.

<i>select proper approval authority</i>	
Reviewed by:	Approved by:
_____ <i>Signature</i> <i>Date</i> <i>insert name</i>	_____ <i>Signature</i> <i>Date</i> <i>Joseph H. Ostwald</i>
<i>Project Manager/ Contract Administrator</i>	<i>Director, Planning, Design & Construction</i>

00 61 13.13
Contractor Performance Bond

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto select title of obligee in the penal sum of the Contract Price \$ insert the Contract Price in numbers for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly and faithfully perform the contract entered into this insert date, i.e.: 8th day of select month, select year, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract, for the construction of insert name of project as designated in the contract documents, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

**00 61 13.13
Contractor Performance Bond**

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert date, i.e.: 8th* day of *select month, select year*, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract.

Contractor

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

**00 61 13.16
Contractor Payment Bond**

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto select title of obligee in the penal sum of the Contract Price \$ insert the Contract Price in numbers for the use and benefit of claimants, defined as an entity having a contract with the principal or with a subcontractor of the principal for labor, materials, or both labor and materials, used or reasonably required for use in the performance of the contract, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by the principal in connection with the work described in the contract entered into this insert date, i.e.: 8th day of select month, select year, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract, for the construction of insert name of project as designated in the contract documents, and shall fully reimburse the obligee for all outlay and expense with said obligee may incur in making good any default of said principal, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

**00 61 13.16
Contractor Payment Bond**

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert date, i.e.: 8th* day of *select month, select year*, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract.

Contractor

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

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Definitions

1. Definitions
 - 1.1 *Addendum*: A document issued by the Consultant that amends the Bid Documents. Addenda shall not be issued less than seventy-two hours prior to the specified bid opening time.
 - 1.2 *Allowance*: A specified dollar amount for a particular scope of work or service included in the Work that is identified in the Bid Documents and included in each Bidder's Bid. The Contractor shall document expenditures for an Allowance during the Project. Any unused balance shall be credited to the Owner. The Contractor is responsible for notifying the Owner of anticipated expenses greater than the specified amount and the Owner is responsible for those additional expenses.
 - 1.3 *Alternate Bid*: The Contractor's written offer of a specified dollar amount, submitted on the Bid Form, for the performance of a particular scope of work described in the Bid Documents. The Owner determines the low bidder based on the sum of the base Bid and any combination of Alternate Bids that the Owner selects.
 - 1.4 *Architect*: A Consultant acting as, or supporting, the Professional-of-Record who is responsible for the design of the Project. Equivalent to "Consultant" in State of Maine contract forms.
 - 1.5 *Architectural Supplemental Instruction (ASI)*: A written instruction from the Architect for the purpose of clarification of the Contract Documents. An ASI does not alter the Contract Price or Contract Time. ASIs may be responses to RFIs and shall be issued by the Architect in a timely manner to avoid any negative impact on the Schedule of the Work.
 - 1.6 *Bid*: The Contractor's written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of the Work. A Bid may include bonds or other requirements. A base Bid is separate and distinct from Alternate Bids, being the only cost component necessary for the award of the contract, and representing the minimum amount of Work that is essential for the functioning of the Project.
 - 1.7 *Bid Bond*: The security designated in the Bid Documents, furnished by Bidders as a guaranty of good faith to enter into a contract with the Owner, should a contract be awarded to that Bidder.
 - 1.8 *Bidder*: Any business entity, individual or corporation that submits a bid for the performance of the work described in the Bid Documents, acting directly or through a duly authorized representative. See also *Responsive and Responsible Bidder*.
 - 1.9 *Bid Documents*: The drawings, procurement and contracting requirements, general requirements, and the written specifications -including all addenda, that a bidder is required to reference in the submission of a bid.
 - 1.10 *Bureau*: The State of Maine Bureau of General Services, or BGS, in the Department of Administrative and Financial Services.
 - 1.11 *Calendar days*: Consecutive days, as occurring on a calendar, taking into account each day of the week, month, year, and any religious, national or local holidays. Calendar days are used for changes in Contract Time.

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Definitions

- 1.12 *Certificate of Substantial Completion*: A document developed by the Consultant that describes the final status of the Work and establishes the date that the Owner may use the facility for its intended purpose. The Certificate of Substantial Completion may also include a provisional list of items - a "punch list" - remaining to be completed by the Contractor. The Certificate of Substantial Completion identifies the date from which the project warranty period commences.
- 1.13 *Certificate of Occupancy*: A document developed by a local jurisdiction such as the Code Enforcement Officer that grants permission to the Owner to occupy a building.
- 1.14 *Change Order (CO)*: A document that modifies the contract and establishes the basis of a specific adjustment to the Contract Price or the Contract Time, or both. Change Orders may address correction of omissions, errors, and document discrepancies, or additional requirements. Change Orders should include all labor, materials and incidentals required to complete the work described. A Change Order is not valid until signed by the Contractor, Owner and Consultant and approved by the Bureau.
- 1.15 *Change Order Proposal (COP) (see also Proposal)*: Contract change proposed by the Contractor regarding the contract amount, requirements, or time. The Contractor implements the work of a COP after it is accepted by all parties. Accepted COPs are incorporated into the contract by Change Order.
- 1.16 *Clerk of the Works*: The authorized representative of the Consultant on the job site. Clerk of the Works is sometimes called the Architect's representative.
- 1.17 *Construction Change Directive (CCD)*: A written order prepared by the Consultant and signed by the Owner and Consultant, directing a change in the Work prior to final agreement with the Contractor on adjustment, if any, in the Contract Price or Contract Time, or both.
- 1.18 *Contract*: A written agreement between the Owner and the successful bidder which obligates the Contractor to perform the work specified in the Contract Documents and obligates the Owner to compensate the Contractor at the mutually accepted sum, rates or prices.
- 1.19 *Contract Bonds (also known as Payment and Performance Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.20 *Contract Documents*: The drawings and written specifications (including all addenda), Standard General Conditions, and the contract (including all Change Orders subsequently incorporated in the documents).
- 1.21 *Contract Expiration Date*: Date determined by the Owner as a deadline for internal management of contract accounts. This allows time after the Contract Final Completion Date for processing the final Requisition for Payment. The Contract Expiration Date does not directly relate to any contract obligation of the Contractor.
- 1.22 *Contract Final Completion Date*: Point of time when the Work is fully completed in compliance with the Contract Documents, as certified by the Consultant. Final payment to the Contractor is due upon Final Completion of the Project.
- 1.23 *Contract Price*: The dollar amount of the construction contract, also called *Contract Sum*.

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Definitions

- 1.24 *Contract Time*: The designated duration of time to execute the Work of the contract, with a specific date for completion.
- 1.25 *Contractor*: Also called the "General Contractor" or "GC" the individual or entity undertaking the execution of the general contract work under the terms of the contract with the Owner, acting directly or through a duly authorized representative. The Contractor is responsible for the means, methods and materials utilized in the execution and completion of the Work.
- 1.26 *Consultant*: The Architect or Engineer acting as Professional-of-Record for the Project. The Consultant is responsible for the design of the Project.
- 1.27 *Drawings*: The graphic and pictorial portion of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
- 1.28 *Engineer*: A Consultant acting as, or supporting, the Professional-of-Record who is responsible for the design of the Project. Equivalent to "Consultant" in State of Maine contract forms.
- 1.29 *Filed Sub-bid*: The designated major Subcontractor's (or, in some cases, Contractor's) written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of a particular portion of the Work. A Filed Sub-bid may include bonds or other requirements.
- 1.30 *General Requirements*: The on-site overhead expense items the Contractor provides for the Project, typically including, but not limited to, building permits, construction supervision, Contract Bonds, insurance, field office, temporary utilities, rubbish removal, and site fencing. Overhead expenses of the Contractor's general operation are not included. Sometimes referred to as the Contractor's General Conditions.
- 1.31 *Owner*: The State agency which is represented by duly authorized individuals. The Owner is responsible for defining the scope of the Project and compensation to the Consultant and Contractor.
- 1.32 *Owner's Representative*: The individual or entity contracted by the Owner to be an advisor and information conduit regarding the Project.
- 1.33 *Overhead*: General and administrative expenses of the Contractor's principal and branch offices, including payroll costs and other compensation of Contractor employees, deductibles paid on any insurance policy, charges against the Contractor for delinquent payments, and costs related to the correction of defective work, and the Contractor's capital expenses, including interest on capital used for the work.
- 1.34 *Performance and Payment Bonds (also known as Contract Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.35 *Post-Bid Addendum*: Document issued by the Consultant that defines a potential Change Order prior to signing of the construction contract. The Post-Bid Addendum allows the Owner to negotiate

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Definitions

contract changes with the Bidder submitting the lowest valid bid, only if the negotiated changes to the Bid Documents result in no change or no increase in the bid price.

A Post-Bid Addendum may also be issued after a competitive construction Bid opening to those Bidders who submitted a Bid initially, for the purpose of rebidding the Project work without re-advertising.

- 1.36 *Project*: The construction project proposed by the Owner to be constructed according to the Contract Documents. The Project, a public improvement, may be tied logistically to other public improvements and other activities conducted by the Owner or other contractors.
- 1.37 *Proposal (see also Change Order Proposal)*: The Contractor's written offer submitted to the Owner for consideration containing a specified dollar amount or rate, for a specific scope of work, and including a schedule impact, if any. A proposal shall include all costs for overhead and profit. The Contractor implements the work of a Proposal after it is accepted by all parties. Accepted Proposals are incorporated into the contract by Change Order.
- 1.38 *Proposal Request (PR)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.39 *Punch List*: A document that identifies the items of work remaining to be done by the Contractor at the Close Out of a Project. The Punch List is created as a result of a final inspection of the work only after the Contractor attests that all of the Work is in its complete and permanent status.
- 1.40 *Request For Information (RFI)*: A Contractor's written request to the Consultant for clarification, definition or description of the Work. RFIs shall be presented by the Contractor in a timely manner to avoid any negative impact on the Schedule of the Work.
- 1.41 *Request For Proposal (RFP)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.42 *Requisition for Payment*: The document in which the Contractor certifies that the Work described is, to the best of the Contractor's knowledge, information and belief, complete and that all previous payments have been paid by the Contractor to Subcontractors and suppliers, and that the current requested payment is now due. See *Schedule of Values*.
- 1.43 *Responsive and Responsible Bidder*: A bidder who complies, when submitting a bid on a given project, with the following *responsive* standards, as required by the Bid Documents:
- submits specific qualifications to bid the project, if required;
 - attends mandatory pre-bid conferences, if required;
 - submits a bid prior to the close of the bid period;
 - submits a complete bid form;
 - submits a bid without indications of intent contrary to the stated requirements;
 - submits other materials and information, such as bid security, as required;
- and, meets the following minimums regarding these *responsible* standards:
- sustains a satisfactory record of project performance;
 - maintains a permanent place of business in a known physical location;
 - possesses the financial means for short- and long-term operations;
 - possesses the appropriate technical experience and capabilities;
 - employs adequate personnel and subcontractor resources;

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Definitions

maintains the equipment needed to perform the work;
complies with the proposed implementation schedule;
complies with the insurance and bonding requirements;
provides post-construction warranty coverage;
and other criteria which can be considered relevant to the contract.

- 1.44 *Retainage*: The amount, calculated at five percent (5%) of the contract value or a scheduled value, that the Owner shall withhold from the Contractor until the work or portion of work is declared substantially complete or otherwise accepted by the Owner. The Owner may, if requested, reduce the amount withheld if the Owner deems it desirable and prudent to do so. (See Title 5 M.R.S.A., Section 1746.)
- 1.45 *Sample*: A physical example provided by the Contractor which illustrates materials, equipment or workmanship and establishes standards by which the Work will be judged.
- 1.46 *Schedule of the Work*: The document prepared by the Contractor and approved by the Owner that specifies the dates on which the Contractor plans to begin and complete various parts of the Work, including dates on which information and approvals are required from the Owner.
- 1.47 *Schedule of Values*: The document prepared by the Contractor and approved by the Owner before the commencement of the Work that specifies the dollar values of discrete portions of the Work equal in sum to the contract amount. The Schedule of Values is used to document progress payments of the Work in regular (usually monthly) requisitions for payment. See *Requisition for Payment*.
- 1.48 *Shop Drawings*: The drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
- 1.49 *Specifications*: The portion of the Contract Documents consisting of the written requirements of the Work for materials, equipment, systems, standards, workmanship, and performance of related services.
- 1.50 *Subcontractor*: An individual or entity undertaking the execution of any part of the Work by virtue of a written agreement with the Contractor or any other Subcontractor. Also, an individual or entity retained by the Contractor or any other Subcontractor as an independent contractor to provide the labor, materials, equipment or services necessary to complete a specific portion of the Work.
- 1.51 *Substantial Completion Date*: Point of time when the Work or a designated portion of the Work is sufficiently complete in compliance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended purpose without unscheduled disruption. Substantial Completion is documented by the date of the Certificate of Substantial Completion signed by the Owner and the Contractor.
- 1.52 *Superintendent*: The representative of the Contractor on the job site, authorized by the Contractor to receive and fulfill instructions from the Consultant.
- 1.53 *Surety*: The individual or entity that is legally bound with the Contractor and Subcontractor to insure the faithful performance of the contract and for the payment of the bills for labor, materials and equipment by the Contractor and Subcontractors.

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- 1.54 *Work*: The construction and services, whether completed or partially completed, including all labor, materials, equipment and services provided or to be provided by the Contractor and Subcontractors to fulfill the requirements of the Project as described in the Contract Documents.

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General Conditions

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General Conditions

1. Preconstruction Conference

- 1.1 The Contractor shall, upon acceptance of a contract and prior to commencing work, schedule a preconstruction conference with the Owner and Consultant. The purpose of this conference is as follows.
- 1.1.1 Introduce all parties who have a significant role in the Project, including:
Owner (State agency or other contracting entity)
 Owner's Representative
Consultant (Architect or Engineer)
 Subconsultants
 Clerk-of-the-works
Contractor (GC)
 Superintendent
 Subcontractors
Other State agencies
Construction testing company
Commissioning agent
Special Inspections agent
Bureau of General Services (BGS);
- 1.1.2 Review the responsibilities of each party;
- 1.1.3 Review any previously-identified special provisions of the Project;
- 1.1.4 Review the Schedule of the Work calendar submitted by the Contractor to be approved by the Owner and Consultant;
- 1.1.5 Review the Schedule of Values form submitted by the Contractor to be approved by the Owner and Consultant;
- 1.1.6 Establish routines for Shop Drawing approval, contract changes, requisitions, et cetera;
- 1.1.7 discuss jobsite issues;
- 1.1.8 Discuss Project close-out procedures;
- 1.1.9 Provide an opportunity for clarification of Contract Documents before work begins; and
- 1.1.10 Schedule regular meetings at appropriate intervals for the review of the progress of the Work.

2. Intent and Correlation of Contract Documents

- 2.1 The intent of the Contract Documents is to describe the complete Project. The Contract Documents consist of various components; each component complements the others. What is shown as a requirement by any one component shall be inferred as a requirement on all corresponding components.
- 2.2 The Contractor shall furnish all labor, equipment and materials, tools, transportation, insurance, services, supplies, operations and methods necessary for, and reasonably incidental to, the construction and completion of the Project. Any work that deviates from the Contract Documents which appears to be required by the exigencies of construction or by inconsistencies in the Contract Documents, will be determined by the Consultant and authorized in writing by the Consultant, Owner and the Bureau prior to execution. The Contractor shall be responsible for requesting clarifying information where the intent of the Contract Documents is uncertain.
- 2.3 The Contractor shall not utilize any apparent error or omission in the Contract Documents to the disadvantage of the Owner. The Contractor shall promptly notify the Consultant in writing of such errors or omissions. The Consultant shall make any corrections or clarifications necessary in such a situation to document the true intent of the Contract Documents.

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General Conditions

3. Additional Drawings and Specifications

- 3.1 Upon the written request of the Contractor, the Owner shall provide, at no expense to the Contractor, up to five sets of printed Drawings and Specifications for the execution of the Work.
- 3.2 The Consultant shall promptly furnish to the Contractor revised Drawings and Specifications, for the area of the documents where those revisions apply, when corrections or clarifications are made by the Consultant. All such information shall be consistent with, and reasonably inferred from, the Contract Documents. The Contractor shall do no work without the proper Drawings and Specifications.

4. Ownership of Contract Documents

- 4.1 The designs represented on the Contract Documents are the property of the Consultant. The Drawings and Specifications shall not be used on other work without consent of the Consultant.

5. Permits, Laws, and Regulations

- 5.1 The Owner is responsible for obtaining any zoning approvals or other similar local project approvals necessary to complete the Work, unless otherwise specified in the Contract Documents.
- 5.2 The Owner is responsible for obtaining Maine Department of Environmental Protection, Maine Department of Transportation, or other similar state government project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 5.3 The Owner is responsible for obtaining any federal agency project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 5.4 The Owner is responsible for obtaining all easements for permanent structures or permanent changes in existing facilities.
- 5.5 The Contractor is responsible for obtaining and paying for all permits and licenses necessary for the implementation of the Work. The Contractor shall notify the Owner of any delays, variance or restrictions that may result from the issuing of permits and licenses.
- 5.6 The Contractor shall comply with all ordinances, laws, rules and regulations and make all required notices bearing on the implementation of the Work. In the event the Contractor observes disagreement between the Drawings and Specifications and any ordinances, laws, rules and regulations, the Contractor shall promptly notify the Consultant in writing. Any necessary changes shall be made as provided in the contract for changes in the work. The Contractor shall not perform any work knowing it to be contrary to such ordinances, laws, rules and regulations.
- 5.7 The Contractor shall comply with local, state and federal regulations regarding construction safety and all other aspects of the Work.
- 5.8 The Contractor shall comply with the Maine Code of Fair Practices and Affirmative Action, 5 M.R.S. §784 (2).

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6. Taxes

- 6.1 The Owner is exempt from the payment of Maine State sales and use taxes as provided in 36 M.R.S. §1760 (1). The Contractor and Subcontractors shall not include taxes on exempt items in the construction contract.
- 6.2 Section 1760 further provides in subsection 61 that sales to a construction contractor or its subcontractor of tangible personal property that is to be physically incorporated in, and become a permanent part of, real property for sale to or owned by the Owner, are exempt from Maine State sales and use taxes. Tangible personal property is defined in 36 M.R.S. §1752 (17).
- 6.3 The Contractor may contact Maine Revenue Services, 24 State House Station, Augusta, Maine 04333 for guidance on tax exempt regulations authorized by 36 M.R.S. §1760 and detailed in Rule 302 (18-125 CMR 302).

7. Labor and Wages

- 7.1 The Contractor shall conform to the labor laws of the State of Maine, and all other laws, ordinances, and legal requirements affecting the work in Maine.
- 7.2 The Consultant shall include a wage determination document prepared by the Maine Department of Labor in the Contract Documents for state-funded contracts in excess of \$50,000. The document shows the minimum wages required to be paid to each category of labor employed on the project.
- 7.3 On projects requiring a Maine wage determination, the Contractor shall submit monthly payroll records to the Owner ("the contracting agency") showing the name and occupation of all workers and all independent contractors employed on the project. The monthly submission must also include the Contractor's company name, the title of the project, hours worked, hourly rate or other method of remuneration, and the actual wages or other compensation paid to each person.
- 7.4 The Contractor shall not reveal, in the payroll records submitted to the Owner, personal information regarding workers and independent contractors, other than the information described above. Such information shall not include Social Security number, employee identification number, or employee address or phone number, for example.
- 7.5 The Contractor shall conform to Maine statute (39-A M.R.S. §105-A (6)) by providing to the Workers' Compensation Board a list of all subcontractors and independent contractors on the job site and a record of the entity to whom that subcontractor or independent contractor is directly contracted and by whom that subcontractor or independent contractor is insured for workers' compensation purposes.
- 7.6 The Contractor shall enforce strict discipline and good order among their employees at all times, and shall not employ any person unfit or unskilled to do the work assigned to them.
- 7.7 The Contractor shall promptly pay all employees when their compensation is due, shall promptly pay all others who have billed and are due for materials, supplies and services used in the Work, and shall promptly pay all others who have billed and are due for insurance, workers compensation coverage, federal and state unemployment compensation, and Social Security

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charges pertaining to this Project. Before final payments are made, the Contractor shall furnish to the Owner affidavits that all such payments described above have been made.

- 7.8 The Contractor may contact the Maine Department of Labor, 54 State House Station, Augusta, Maine 04333 for guidance on labor issues.
- 7.9 The Contractor may contact the Maine Workers' Compensation Board, 27 State House Station, Augusta, Maine 04333 for guidance on workers' compensation issues.

8. Indemnification

- 8.1 The Contractor shall indemnify and hold harmless the Owner and its officers and employees from and against any and all damages, liabilities, and costs, including reasonable attorney's fees, and defense costs, for any and all injuries to persons or property, including claims for violation of intellectual property rights, to the extent caused by the negligent acts or omissions of the Contractor, its employees, agents, officers or subcontractors in the performance of work under this Agreement. The Contractor shall not be liable for claims to the extent caused by the negligent acts or omissions of the Owner or for actions taken in reasonable reliance on written instructions of the Owner.
- 8.2 The Contractor shall notify the Owner promptly of all claims arising out of the performance of work under this Agreement by the Contractor, its employees or agents, officers or subcontractors.
- 8.3 This indemnity provision shall survive the termination of the Agreement, completion of the project or the expiration of the term of the Agreement.

9. Insurance Requirements

- 9.1 The Contractor shall provide, with each original of the signed Contract, an insurance certificate or certificates acceptable to the Owner and BGS. The Contractor shall submit insurance certificates to the Owner and BGS at the commencement of this Contract and at policy renewal or revision dates. The certificates shall identify the project name and BGS project number, and shall name the Owner as certificate holder and as additional insured for general liability and automobile liability coverages. The submitted forms shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least ten days prior written notice by registered letter has been given to the Owner and BGS.
- 9.2 The Owner does not warrant or represent that the insurance required herein constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor is responsible for the existence, extent and adequacy of insurance prior to commencement of work. The Contractor shall not allow any Subcontractor to commence work until all similar insurance required of the Subcontractor has been confirmed by the Contractor.
- 9.3 The Contractor shall procure and maintain primary insurance for the duration of the Project and, if written on a Claims-Made basis, shall also procure and maintain Extended Reporting Period (ERP) insurance for the period of time that any claims could be brought. The Contractor shall ensure that all Subcontractors they engage or employ will procure and maintain similar insurance

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in form and amount acceptable to the Owner and BGS. At a minimum, the insurance shall be of the types and limits set forth herein protecting the Contractor from claims which may result from the Contractor's execution of the Work, whether such execution be by the Contractor or by those employed by the Contractor or by those for whose acts they may be liable. All required insurance coverages shall be placed with carriers authorized to conduct business in the State of Maine by the Maine Bureau of Insurance.

9.3.1 The Contractor shall have Workers' Compensation insurance for all employees on the Project site in accordance with the requirements of the Workers' Compensation law of the State of Maine. Minimum acceptable limits for Employer's Liability are:

Bodily Injury by Accident.....	\$500,000
Bodily Injury by Disease.....	\$500,000 Each Employee
Bodily Injury by Disease.....	\$500,000 Policy Limit

9.3.2 The Contractor shall have Commercial General Liability insurance providing coverage for bodily injury and property damage liability for all hazards of the Project including premise and operations, products and completed operations, contractual, and personal injury liabilities. The policy shall include collapse and underground coverage as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a location or project basis. Minimum acceptable limits are:

General aggregate limit	\$2,000,000
Products and completed operations aggregate	\$1,000,000
Each occurrence limit.....	\$1,000,000
Personal injury aggregate.....	\$1,000,000

9.3.3 The Contractor shall have Automobile Liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, ownership or use of all owned, non-owned and hired automobiles, trucks and trailers. Minimum acceptable limit is:
Any one accident or loss\$500,000

9.3.4 For the portion of a project which is new construction, the Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor, and any Subcontractor as insureds as their interest may appear. Covered causes of loss form shall be all Risks of Direct Physical Loss, endorsed to include flood, earthquake, transit and sprinkler leakage where sprinkler coverage is applicable. Unless specifically authorized in writing by the Owner, the limit of insurance shall not be less than the initial contract amount, for the portion of the project which is new construction, and coverage shall apply during the entire contract period and until the work is accepted by the Owner.

9.3.5 The Contractor shall have Owner's Protective Liability insurance for contract values \$50,000 and above, naming the Owner as the Named Insured. Minimum acceptable limits are:

General aggregate limit	\$2,000,000
Each occurrence limit.....	\$1,000,000

10. Contract Bonds

10.1 When noted as required in the Bid Documents, the Contractor shall provide to the Owner a Performance Bond and a Payment Bond, or "contract bonds", upon execution of the contract. Each bond value shall be for the full amount of the contract and issued by a surety company authorized to do business in the State of Maine as approved by the Owner. The bonds shall be

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executed on the forms furnished in the Bid Documents. The bonds shall allow for any subsequent additions or deductions of the contract.

- 10.2 The contract bonds shall continue in effect for one year after final acceptance of the contract to protect the Owner's interest in connection with the one year guarantee of workmanship and materials and to assure settlement of claims for the payment of all bills for labor, materials and equipment by the Contractor.

11. Patents and Royalties

- 11.1 The Contractor shall, for all time, secure for the Owner the free and undisputed right to the use of any patented articles or methods used in the Work. The expense of defending any suits for infringement or alleged infringement of such patents shall be borne by the Contractor. Awards made regarding patent suits shall be paid by the Contractor. The Contractor shall hold the Owner harmless regarding patent suits that may arise due to installations made by the Contractor, and to any awards made as a result of such suits.
- 11.2 Any royalty payments related to the work done by the Contractor for the Project shall be borne by the Contractor. The Contractor shall hold the Owner harmless regarding any royalty payments that may arise due to installations made by the Contractor.

12. Surveys, Layout of Work

- 12.1 The Owner shall furnish all property surveys unless otherwise specified.
- 12.2 The Contractor is responsible for correctly staking out the Work on the site. The Contractor shall employ a competent surveyor to position all construction on the site. The surveyor shall run the axis lines, establish correct datum points and check each line and point on the site to insure their accuracy. All such lines and points shall be carefully preserved throughout the construction.
- 12.3 The Contractor shall lay out all work from dimensions given on the Drawings. The Contractor shall take measurements and verify dimensions of any existing work that affects the Work or to which the Work is to be fitted. The Contractor is solely responsible for the accuracy of all measurements. The Contractor shall verify all grades, lines, levels, elevations and dimensions shown on the Drawings and report any errors or inconsistencies to the Consultant prior to commencing work.

13. Record of Documents

- 13.1 The Contractor shall maintain one complete set of Contract Documents on the jobsite, in good order and current status, for access by the Owner and Consultant.
- 13.2 The Contractor shall maintain, continuously updated, complete records of Requests for Information, Architectural Supplemental Instructions (or equivalent), Information Bulletins, supplemental sketches, Change Order Proposals, Change Orders, Shop Drawings, testing reports, et cetera, for access by the Owner and Consultant.

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14. Allowances

- 14.1 The Contract Price shall include all allowances described in the Contract Documents. The Contractor shall include all overhead and profit necessary to implement each allowance in their Contract Price.
- 14.2 The Contractor shall not be required to employ parties for allowance work against whom the Contractor has a reasonable objection. In such a case, the Contractor shall notify the Owner in writing of their position and shall propose an alternative party to complete the work of the allowance.

15. Shop Drawings

- 15.1 The Contractor shall administer Shop Drawings prepared by the Contractor, Subcontractors, suppliers or others to conform to the approved Schedule of the Work. The Contractor shall verify all field measurements, check and authorize all Shop Drawings and schedules required by the Work. The Contractor is the responsible party and contact for the Contractor's work as well as that of Subcontractors, suppliers or others who provide Shop Drawings.
- 15.2 The Consultant shall review and acknowledge Shop Drawings, with reasonable promptness, for general conformity with the design concept of the project and compliance with the information provided in the Contract Documents.
- 15.3 The Contractor shall provide monthly updated logs containing: requests for information, information bulletins, supplemental instructions, supplemental sketches, change order proposals, change orders, submittals, testing and deficiencies.
- 15.4 The Contractor shall make any corrections required by the Consultant, and shall submit a quantity of corrected copies as may be needed. The acceptance of Shop Drawings or schedules by the Consultant shall not relieve the Contractor from responsibility for deviations from Drawings and Specifications, unless the Contractor has called such deviations to the attention of the Consultant at the time of submission and secured the Consultant's written approval. The acceptance of Shop Drawings or schedules by the Consultant does not relieve the Contractor from responsibility for errors in Shop Drawings or schedules.

16. Samples

- 16.1 The Contractor shall furnish for approval, with reasonable promptness, all samples as directed by the Consultant. The Consultant shall review and approve such samples, with reasonable promptness, for general conformity with the design concept of the project and compliance with the information provided in the Contract Documents. The subsequent work shall be in accord with the approved samples.

17. Substitutions

- 17.1 The Contractor shall furnish items and materials described in the Contract Documents. If the item or material specified describes a proprietary product, or uses the name of a manufacturer, the term "or approved equal" shall be implied, if it is not included in the text. The specific item or material specified establishes a minimum standard for the general design, level of quality, type, function, durability, efficiency, reliability, compatibility, warranty coverage, installation factors

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and required maintenance. The Drawing or written Specification shall not be construed to exclude other manufacturers products of comparable design, quality, and efficiency.

- 17.2 The Contractor may submit detailed information about a proposed substitution to the Consultant for consideration. Particular models of items and particular materials which the Contractor asserts to be equal to the items and materials identified in the Contract Documents shall be allowed only with written approval by the Consultant. The request for substitution shall include a cost comparison and a reason or reasons for the substitution.
- 17.3 The Consultant may request additional information about the proposed substitution. The approval or rejection of a proposed substitution may be based on timeliness of the request, source of the information, the considerations of minimum standards described above, or other considerations. The Consultant should briefly state the rationale for the decision. The decision shall be considered final.
- 17.4 The duration of a substitution review process can not be the basis for a claim for delay in the Schedule of the Work.

18. Assignment of Contract

- 18.1 The Contractor shall not assign or sublet the contract as a whole without the written consent of the Owner. The Contractor shall not assign any money due to the Contractor without the written consent of the Owner.

19. Separate Contracts

- 19.1 The Owner reserves the right to create other contracts in connection with this Project using similar General Conditions. The Contractor shall allow the Owner's other contractors reasonable opportunity for the delivery and storage of materials and the execution of their work. The Contractor shall coordinate and properly connect the Work of all contractors.
- 19.2 The Contractor shall promptly report to the Consultant and Owner any apparent deficiencies in work of the Owner's other contractors that impacts the proper execution or results of the Contractor. The Contractor's failure to observe or report any deficiencies constitutes an acceptance of the Owner's other contractors work as suitable for the interface of the Contractor's work, except for latent deficiencies in the Owner's other contractors work.
- 19.3 Similarly, the Contractor shall promptly report to the Consultant and Owner any apparent deficiencies in their own work that would impact the proper execution or results of the Owner's other contractors.
- 19.4 The Contractor shall report to the Consultant and Owner any conflicts or claims for damages with the Owner's other contractors and settle such conflicts or claims for damages by mutual agreement or arbitration, if necessary, at no expense to the Owner.
- 19.5 In the event the Owner's other contractors sue the Owner regarding any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense. The Contractor shall pay or satisfy any judgment that may arise against the Owner, and pay all other costs incurred.

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20. Subcontracts

- 20.1 The Contractor shall not subcontract any part of this contract without the written permission of the Owner.
- 20.2 The Contractor shall submit a complete list of named Subcontractors and material suppliers to the Consultant and Owner for approval by the Owner prior to commencing work. The Subcontractors named shall be reputable companies of recognized standing with a record of satisfactory work.
- 20.3 The Contractor shall not employ any Subcontractor or use any material until they have been approved, or where there is reason to believe the resulting work will not comply with the Contract Documents.
- 20.4 The Contractor, not the Owner, is as fully responsible for the acts and omissions of Subcontractors and of persons employed by them, as the Contractor is for the acts and omissions of persons directly or indirectly employed by the Contractor.
- 20.5 Neither the Contract Documents nor any Contractor-Subcontractor contract shall indicate, infer or create any direct contractual relationship between any Subcontractor and the Owner.

21. Contractor-Subcontractor Relationship

- 21.1 The Contractor shall be bound to the Subcontractor by all the obligations in the Contract Documents that bind the Contractor to the Owner.
- 21.2 The Contractor shall pay the Subcontractor, in proportion to the dollar value of the work completed and requisitioned by the Subcontractor, the approved dollar amount allowed to the Contractor no more than seven days after receipt of payment from the Owner.
- 21.3 The Contractor shall pay the Subcontractor accordingly if the Contract Documents or the subcontract provide for earlier or larger payments than described in the provision above.
- 21.4 The Contractor shall pay the Subcontractor for completed and requisitioned subcontract work, less retainage, no more than seven days after receipt of payment from the Owner for the Contractor's approved Requisition for Payment, even if the Consultant fails to certify a portion of the Requisition for Payment for a cause not the fault of the Subcontractor.
- 21.5 The Contractor shall not make a claim for liquidated damages or penalty for delay in any amount in excess of amounts that are specified by the subcontract.
- 21.6 The Contractor shall not make a claim for services rendered or materials furnished by the Subcontractor unless written notice is given by the Contractor to the Subcontractor within ten calendar days of the day in which the claim originated.
- 21.7 The Contractor shall give the Subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.

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- 21.8 The Contractor shall pay the Subcontractor a just share of any fire insurance payment received by the Contractor.
- 21.9 The Subcontractor shall be bound to the Contractor by the terms of the Contract Documents and assumes toward the Contractor all the obligations and responsibilities that the Contractor, by those documents, assumes toward the Owner.
- 21.10 The Subcontractor shall submit applications for payment to the Contractor in such reasonable time as to enable the Contractor to apply for payment as specified.
- 21.11 The Subcontractor shall make any claims for extra cost, extensions of time or damages, to the Contractor in the manner provided in these General Conditions for like claims by the Contractor to the Owner, except that the time for the Subcontractor to make claims for extra cost is seven calendar days after the receipt of Consultant's instructions.
22. Supervision of the Work
- 22.1 During all stages of the Work the Contractor shall have a competent superintendent, with any necessary assistant superintendents, overseeing the project. The superintendent shall not be reassigned without the consent of the Owner unless a superintendent ceases to be employed by the Contractor due to unsatisfactory performance.
- 22.2 The superintendent represents the Contractor on the jobsite. Directives given by the Consultant or Owner to the superintendent shall be as binding as if given directly to the Contractor's main office. All important directives shall be confirmed in writing to the Contractor. The Consultant and Owner are not responsible for the acts or omissions of the superintendent or assistant superintendents.
- 22.3 The Contractor shall provide supervision of the Work equal to the industry's highest standard of care. The superintendent shall carefully study and compare all Contract Documents and promptly report any error, inconsistency or omission discovered to the Consultant. The Contractor may not necessarily be held liable for damages resulting directly from any error, inconsistency or omission in the Contract Documents or other instructions by the Consultant that was not revealed by the superintendent in a timely way.
23. Observation of the Work
- 23.1 The Contractor shall allow the Owner, the Consultant and the Bureau continuous access to the site for the purpose of observation of the progress of the work. All necessary safeguards and accommodations for such observations shall be provided by the Contractor.
- 23.2 The Contractor shall coordinate all required testing, approval or demonstration of the Work. The Contractor shall give sufficient notice to the appropriate parties of readiness for testing, inspection or examination.
- 23.3 The Contractor shall schedule inspections and obtain all required certificates of inspection for inspections by a party other than the Consultant.

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- 23.4 The Consultant shall make all scheduled observations promptly, prior to the work being concealed or buried by the Contractor. If approval of the Work is required of the Consultant, the Contractor shall notify the Consultant of the construction schedule in this regard. Work concealed or buried prior to the Consultant's approval may need to be uncovered at the Contractor's expense.
- 23.5 The Consultant may order reexamination of questioned work, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to conform to the Contract Documents, the Owner shall pay the expense of the reexamination and remedial work. If the work is found to not conform to the Contract Documents, the Contractor shall pay the expense, unless the defect in the work was caused by the Owner's Contractor, whose responsibility the reexamination expense becomes.
- 23.6 The Bureau shall periodically observe the Work during the course of construction and make recommendations to the Contractor or Consultant as necessary. Such recommendations shall be considered and implemented through the usual means for changes to the Work.
24. Consultant's Status
- 24.1 The Consultant represents the Owner during the construction period, and observes the work in progress on behalf of the Owner. The Consultant has authority to act on behalf of the Owner only to the extent expressly provided by the Contract Documents or otherwise demonstrated to the Contractor. The Consultant has authority to stop the work whenever such an action is necessary, in the Consultant's reasonable opinion, to ensure the proper execution of the contract.
- 24.2 The Consultant is the interpreter of the conditions of the contract and the judge of its performance. The Consultant shall favor neither the Owner nor the Contractor, but shall use the Consultant's powers under the contract to enforce faithful performance by both parties.
- 24.3 In the event of the termination of the Consultant's employment on the project prior to completion of the work, the Owner shall appoint a capable and reputable replacement. The status of the new Consultant relative to this contract shall be that of the former Consultant.
25. Management of the Premises
- 25.1 The Contractor shall place equipment and materials, and conduct activities on the premises in a manner that does not unreasonably hinder site circulation, environmental stability, or any long term effect. Likewise, the Consultant's directions shall not cause the use of premises to be impeded for the Contractor or Owner.
- 25.2 The Contractor shall not use the premises for any purpose other than that which is directly related to the scope of work. The Owner shall not use the premises for any purpose incompatible with the proposed work simultaneous to the work of the Contractor.
- 25.3 The Contractor shall enforce the Consultant's instructions regarding information posted on the premises such as signage and advertisements, as well as activities conducted on the premises such as fires, and smoking.

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- 25.4 The Owner may occupy any part of the Project that is completed with the written consent of the Contractor, and without prejudice to any of the rights of the Owner or Contractor. Such use or occupancy shall not, in and of itself, be construed as a final acceptance of any work or materials.
26. Safety and Security of the Premises
- 26.1 The Contractor shall designate, and make known to the Consultant and the Owner, a safety officer whose duty is the prevention of accidents on the site.
- 26.2 The Contractor shall continuously maintain security on the premises and protect from unreasonable occasion of injury all people authorized to be on the job site. The Contractor shall also effectively protect the property and adjacent properties from damage or loss.
- 26.3 The Contractor shall take all necessary precautions to ensure the safety of workers and others on and adjacent to the site, abiding by applicable local, state and federal safety regulations. The Contractor shall erect and continuously maintain safeguards for the protection of workers and others, and shall post signs and other warnings regarding hazards associated with the construction process, such as protruding fasteners, moving equipment, trenches and holes, scaffolding, window, door or stair openings, and falling materials.
- 26.4 The Contractor shall restore the premises to conditions that existed prior to the start of the project at areas not intended to be altered according to the Contract Documents.
- 26.5 The Contractor shall protect existing utilities and exercise care working in the vicinity of utilities shown in the Drawings and Specifications or otherwise located by the Contractor.
- 26.6 The Contractor shall protect from damage existing trees and other significant plantings and landscape features of the site which will remain a permanent part of the site. If necessary or indicated in the Contract Documents, tree trunks shall be boxed and barriers erected to prevent damage to tree branches or roots.
- 26.7 The Contractor shall repair or replace damage to the Work caused by the Contractor's or Subcontractor's forces, including that which is reasonably protected, at the expense of the responsible party.
- 26.8 The Contractor shall not load, or allow to be loaded, any part of the Project with a force which imperils personal or structural safety. The Consultant may consult with the Contractor on such means and methods of construction, however, the ultimate responsibility lies with the Contractor.
- 26.9 The Contractor shall not jeopardize any work in place with subsequent construction activities such as blasting, drilling, excavating, cutting, patching or altering work. The Consultant must approve altering any structural components of the project. The Contractor shall supervise all construction activities carried out by others on site to ensure that the work is neatly done and in a manner that will not endanger the structure or the component parts.
- 26.10 The Contractor may act with their sole discretion in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Contractor may negotiate with the Owner for compensation for expenses due to such emergency work.

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- 26.11 The Contractor and Subcontractors shall have no responsibility for the identification, discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous materials in any form at the project site. The Contractor shall avoid disruption of any hazardous materials or toxic substances at the project site and promptly notify the Owner in writing on the occasion of such a discovery.
- 26.12 The Contractor shall keep the premises free of any unsafe accumulation of waste materials caused by the work. The Contractor shall regularly keep the spaces "broom clean". See the Close-out of the Work provisions of this section regarding cleaning at the completion of the project.
27. Changes in the Work
- 27.1 The Contractor shall not proceed with extra work without an approved Change Order or Construction Change Directive. A Change Order which has been properly signed by all parties shall become a part of the contract.
- 27.2 A Change Order is the usual document for directing changes in the Work. In certain circumstances, however, the Owner may utilize a Construction Change Directive to direct the Contractor to perform changes in the Work that are generally consistent with the scope of the project. The Owner shall use a Construction Change Directive only when the normal process for approving changes to the Work has failed to the detriment of the Project, or when agreement on the terms of a Change Order cannot be met, or when an urgent situation requires, in the Owner's judgment, prompt action by the Contractor.
- 27.3 The Consultant shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.
- 27.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Consultant. Work thus completed by the Contractor constitutes the basis for a Change Order. Changes in the Contract Price and Contract Time shall be as defined in the Construction Change Directive unless subsequently negotiated with some other terms.
- 27.5 The method of determining the dollar value of extra work shall be by:
- .1 an estimate of the Contractor accepted by Owner as a lump sum, or
 - .2 unit prices named in the contract or subsequently agreed upon, or
 - .3 cost plus a designated percentage, or
 - .4 cost plus a fixed fee.
- 27.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods so as not to exceed the following rates. The rates include all overhead and profit expenses.
- .1 Contractor - for any work performed by the Contractor's own forces, up to 20% of the cost;
 - .2 Subcontractor - for work performed by Subcontractor's own forces, up to 20% of the cost;
 - .3 Contractor - for work performed by Contractor's Subcontractor, up to 10% of the amount due the Subcontractor.
- 27.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Consultant shall review and certify the appropriate amount which

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- includes the Contractor's overhead and profit. The Owner shall make payments based on the Consultant's certificate.
- 27.8 Cost reflected in Change Orders shall be limited to the following: cost of materials, cost of delivery, cost of labor (including Social Security, pension, Workers' Compensation insurance, and unemployment insurance), and cost of rental of power tools and equipment. Labor cost may include a pro-ratio share of a foreman's time only in the case of an extension of contract time granted due to the Change Order.
- 27.9 Overhead reflected in Change Orders shall be limited to the following: bond premium, supervision, wages of clerks, time keepers, and watchmen, small tools, incidental expenses, general office expenses, and all other overhead expenses directly related to the Change Order.
- 27.10 The Contractor shall provide credit to the Owner for labor, materials, equipment and other costs but not overhead and profit expenses for those Change Order items that result in a net value of credit to the contract.
- 27.11 The Owner may change the scope of work of the Project without invalidating the contract. The Owner shall notify the Contractor of a change of the scope of work for the Owner's Contractors, which may affect the work of this Contractor, without invalidating the contract. Change Orders for extension of the time caused by such changes shall be developed at the time of directing the change in scope of work.
- 27.12 The Consultant may order minor changes in the Work, not involving extra cost, which is consistent with the intent of the design or project.
- 27.13 The Contractor shall immediately give written notification to the Consultant of latent conditions discovered at the site which materially differ from those represented in the Drawings or Specifications, and which may eventually result in a change in the scope of work. The Contractor shall suspend work until receiving direction from the Consultant. The Consultant shall promptly investigate the conditions and respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Consultant shall determine if the discovered conditions warrant a Change Order.
- 27.14 The Contractor shall, within ten calendar days of receipt of the information, give written notification to the Consultant if the Contractor claims that instructions by the Consultant will constitute extra cost not accounted for by Change Order or otherwise under the contract. The Consultant shall promptly respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Consultant shall determine if the Contractor's claim warrants a Change Order.
28. Correction of the Work
- 28.1 The Contractor shall promptly remove from the premises all work the Consultant declares is non-conforming to the contract. The Contractor shall replace the work properly at no expense to the Owner. The Contractor is also responsible for the expenses of others whose work was damaged or destroyed by such remedial work.

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- 28.2 The Owner may elect to remove non-conforming work if it is not removed by the Contractor within a reasonable time, that time defined in a written notice from the Consultant. The Owner may elect to store removed non-conforming work not removed by the Contractor at the Contractor's expense. The Owner may, with ten days written notice, dispose of materials which the Contractor does not remove. The Owner may sell the materials and apply the net proceeds, after deducting all expenses, to the costs that should have been borne by the Contractor.
- 28.3 The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any related damage to other work which appears within a period of one year from the date of substantial completion, and in accord with the terms of any guarantees provided in the contract. The Owner shall promptly give notice of observed defects to the Contractor and Consultant. The Consultant shall determine the status of all claimed defects. The Contractor shall perform all remedial work without unjustifiable delay in either the initial response or the corrective action.
- 28.4 The Consultant may authorize, after a reasonable notification to the Contractor, an equitable deduction from the contract amount in lieu of the Contractor correcting non-conforming or defective work.
29. Owner's Right to do Work
- 29.1 The Owner may, using other contractors, correct deficiencies attributable to the Contractor, or complete unfinished work. Such action shall take place only after giving the Contractor three days written notice, and provided the Consultant approves of the proposed course of action as an appropriate remedy. The Owner may then deduct the cost of the remedial work from the amount due the Contractor.
- 29.2 The Owner may act with their sole discretion when the Contractor is unable to take action in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Owner shall inform the Contractor of the emergency work performed, particularly where it may affect the work of the Contractor.
30. Termination of Contract and Stop Work Action
- 30.1 The Owner may, owing to a certificate of the Consultant indicating that sufficient cause exists to justify such action, without prejudice to any other right or remedy and after giving the Contractor and the Contractor's surety seven days written notice, terminate the employment of the Contractor. At that time the Owner may take possession of the premises and of all materials,

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tools and appliances on the premises and finish the work by whatever method the Owner may deem expedient. Cause for such action by the Owner includes:

- .1 the contractor is adjudged bankrupt, or makes a general assignment for the benefit of its creditors, or
- .2 a receiver is appointed due to the Contractor's insolvency, or
- .3 the Contractor persistently or repeatedly refuses or fails to provide enough properly skilled workers or proper materials, or
- .4 the Contractor fails to make prompt payment to Subcontractors or suppliers of materials or labor, or
- .5 the Contractor persistently disregards laws, ordinances or the instructions of the Consultant, or is otherwise found guilty of a substantial violation of a provision of the Contract Documents.

- 30.2 The Contractor is not entitled, as a consequence of the termination of the employment of the Contractor as described above, to receive any further payment until the Work is finished. If the unpaid balance of the contract amount exceeds the expense of finishing the Work, including compensation for additional architectural, managerial and administrative services, such balance shall be paid to the Contractor. If the expense of finishing the Work exceeds the unpaid balance, the Contractor shall pay the difference to the Owner. The Consultant shall certify the expense incurred by the Contractor's default. This obligation for payment shall continue to exist after termination of the contract.
- 30.3 The Contractor may, if the Work is stopped by order of any court or other public authority for a period of thirty consecutive days, and through no act or fault of the Contractor or of anyone employed by the Contractor, with seven days written notice to the Owner and the Consultant, terminate this contract. The Contractor may then recover from the Owner payment for all work executed, any proven loss and reasonable profit and damage.
- 30.4 The Contractor may, if the Consultant fails to issue a certificate for payment within seven days after the Contractor's formal request for payment, through no fault of the Contractor, or if the Owner fails to pay to the Contractor within 30 days after submission of any sum certified by the Consultant, with seven days written notice to the Owner and the Consultant, stop the Work or terminate this Contract.

31. Delays and Extension of Time

- 31.1 The completion date of the contract shall be extended if the work is delayed by changes ordered in the work which have approved time extensions, or by an act or neglect of the Owner, the Consultant, or the Owner's Contractor, or by strikes, lockouts, fire, flooding, unusual delay in transportation, unavoidable casualties, or by other causes beyond the Contractor's control. The Consultant shall determine the status of all claimed causes.
- 31.2 The contract shall not be extended for delay occurring more than seven calendar days before the Contractor's claim made in writing to the Consultant. In case of a continuing cause of delay, only one claim is necessary.
- 31.3 The contract shall not be extended due to failure of the Consultant to furnish drawings if no schedule or agreement is made between the Contractor and the Consultant indicating the dates

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which drawings shall be furnished and fourteen calendar days has passed after said date for such drawings.

31.4 This article does not exclude the recovery of damages for delay by either party under other provisions in the Contract Document.

32. Payments to the Contractor

- 32.1 As noted under *Preconstruction Conference* in this section, the Contractor shall submit a Schedule of Values form, before the first application for payment, for approval by the Owner and Consultant. The Consultant may direct the Contractor to provide evidence that supports the correctness of the form. The approved Schedule of Values shall be used as a basis for payments.
- 32.2 The Contractor shall submit an application for each payment (“Requisition for Payment”) on a form approved by the Owner and Consultant. The Consultant may require receipts or other documents showing the Contractor's payments for materials and labor, including payments to Subcontractors.
- 32.3 The Contractor shall submit Requisitions for Payment as the work progresses not more frequently than once each month, unless the Owner approves a more frequent interval due to unusual circumstances. The Requisition for Payment is based on the proportionate quantities of the various classes of work completed or incorporated in the Work, in agreement with the actual progress of the Work and the dollar value indicated in the Schedule of Values.
- 32.4 The Consultant shall verify and certify each Requisition for Payment which appears to be complete and correct prior to payment being made by the Owner. The Consultant may certify an appropriate amount for materials not incorporated in the Work which have been delivered and suitably stored at the site. The Contractor shall submit bills of sale, insurance certificates, or other such documents that will adequately protect the Owner’s interests prior to payments being certified.
- 32.5 In the event any materials delivered but not yet incorporated in the Work have been included in a certified Requisition for Payment with payment made, and said materials thereafter are damaged, deteriorated or destroyed, or for any reason whatsoever become unsuitable or unavailable for use in the Work, the full amount previously allowed shall be deducted from subsequent payments unless the Contractor satisfactorily replaces said material.
- 32.6 The Contractor may request certification of an appropriate dollar amount for materials not incorporated in the Work which have been delivered and suitably stored away from the site. The Contractor shall submit bills of sale, insurance certificates, right-of-entry documents or other such documents that will adequately protect the Owner’s interests. The Consultant shall determine if the Contractor's documentation for the materials is complete and specifically designated for the Project. The Owner may allow certification of such payments.
- 32.7 Subcontractors may request, and shall receive from the Consultant, copies of approved Requisitions for Payment showing the amounts certified in the Schedule of Values.
- 32.8 Certified Requisitions for Payment, payments made to the Contractor, or partial or entire occupancy of the project by the Owner shall not constitute an acceptance of any work that does

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not conform to the Contract Documents. The making and acceptance of the final payment constitutes a waiver of all claims by the Owner, other than those arising from unsettled liens, from faulty work or materials appearing within one year from final payment or from requirements of the Drawings and Specifications, and of all claims by the Contractor, except those previously made and still unsettled.

33. Payments Withheld

- 33.1 The Owner shall retain five percent of each payment due the Contractor as part security for the fulfillment of the contract by the Contractor. The Owner may make payment of a portion of this “retainage” to the Contractor temporarily or permanently during the progress of the Work. The Owner may thereafter withhold further payments until the full amount of the five percent is reestablished. The Contractor may deposit with the Maine State Treasurer certain securities in place of retainage amounts due according to Maine Statute (5 M.R.S. §1746).
- 33.2 The Consultant may withhold or nullify the whole or a portion of any Requisitions for Payment submitted by the Contractor in the amount that may be necessary, in his reasonable opinion, to protect the Owner from loss due to any of the following:
- .1 defective work not remedied;
 - .2 claims filed or reasonable evidence indicating probable filing of claims;
 - .3 failure to make payments properly to Subcontractors or suppliers;
 - .4 a reasonable doubt that the contract can be completed for the balance then unpaid;
 - .5 liability for damage to another contractor.

The Owner shall make payment to the Contractor, in the amount withheld, when the above circumstances are removed.

34. Liens

- 34.1 The Contractor shall deliver to the Owner a complete release of all liens arising out of this contract before the final payment or any part of the retainage payment is released. The Contractor shall provide with the release of liens an affidavit asserting each release includes all labor and materials for which a lien could be filed. Alternately, the Contractor, in the event any Subcontractor or supplier refuses to furnish a release of lien in full, may furnish a bond satisfactory to the Owner, to indemnify the Owner against any lien.
- 34.2 In the event any lien remains unsatisfied after all payments to the Contractor are made by the Owner, the Contractor shall refund to the Owner all money that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney’s fees.

35. Workmanship

- 35.1 The Contractor shall provide materials, equipment, and installed work equal to or better than the quality specified in the Contract Documents and approved in submittal and sample. The installation methods shall be of the highest standards, and the best obtainable from the respective trades. The Consultant’s decision on the quality of work shall be final.

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- 35.2 The Contractor shall know local labor conditions for skilled and unskilled labor in order to apply the labor appropriately to the Work. All labor shall be performed by individuals well skilled in their respective trades.
- 35.3 The Contractor shall perform all cutting, fitting, patching and placing of work in such a manner to allow subsequent work to fit properly, whether that be by the Contractor, the Owner's Contractors or others. The Owner and Consultant may advise the Contractor regarding such subsequent work. Notwithstanding the notification or knowledge of such subsequent work, the Contractor may be directed to comply with this standard of compatible construction by the Consultant at the Contractor's expense.
- 35.4 The Contractor shall request clarification or revision of any design work by the Consultant, prior to commencing that work, in a circumstance where the Contractor believes the work cannot feasibly be completed at the highest quality, or as indicated in the Contract Documents. The Consultant shall respond to such requests in a timely way, providing clarifying information, a feasible revision, or instruction allowing a reduced quality of work. The Contractor shall follow the direction of the Consultant regarding the required request for information.
- 35.5 The Contractor shall guarantee the Work against any defects in workmanship and materials for a period of one year commencing with the date of the Certificate of Substantial Completion, unless specified otherwise for specific elements of the project. The Work may also be subdivided in mutually agreed upon components, each defined by a separate Certificate of Substantial Completion.
36. Close-out of the Work
- 36.1 The Contractor shall remove from the premises all waste materials caused by the work. The Contractor shall make the spaces "broom clean" unless a more thorough cleaning is specified. The Contractor shall clean all windows and glass immediately prior to the final inspection, unless otherwise directed.
- 36.2 The Owner may conduct the cleaning of the premises where the Contractor, duly notified by the Consultant, fails to adequately complete the task. The expense of this cleaning may be deducted from the sum due to the Contractor.
- 36.3 The Contractor shall participate in all final inspections and acknowledge the documentation of unsatisfactory work, customarily called the "punch list", to be corrected by the Contractor. The Consultant shall document the successful completion of the Work in a dated Certificate of Substantial Completion, to be signed by Owner, Consultant, and Contractor.
- 36.4 The Contractor shall not call for final inspection of any portion of the Work that is not completely and permanently installed. The Contractor may be found liable for the expenses of individuals called to final inspection meetings prematurely.
- 36.5 The Contractor and all major Subcontractors shall participate in the end-of-warranty-period conference, typically scheduled close to one year after the Substantial Completion date.

**00 72 13
General Conditions**

37. Date of Completion and Liquidated Damages

- 37.1 The Contractor may make a written request to the Owner for an extension or reduction of time, if necessary. The request shall include the reasons the Contractor believes justifies the proposed completion date. The Owner may grant the revision of the contract completion date if the Work was delayed due to conditions beyond the control and the responsibility of the Contractor. The Contractor shall not conduct unauthorized accelerated work or file delay claims to recover alleged damages for unauthorized early completion.

- 37.2 The Contractor shall vigorously pursue the completion of the Work and notify the Owner of any factors that have, may, or will affect the approved Schedule of the Work. The Contractor may be found responsible for expenses of the Owner or Consultant if the Contractor fails to make notification of project delays.

- 37.3 The Project is planned to be done in an orderly fashion which allows for an iterative submittal review process, construction administration including minor changes in the Work and some bad weather. The Contractor shall not file delay claims to recover alleged damages on work the Consultant determines has followed the expected rate of progress.

- 37.4 The Consultant shall prepare the Certificate of Substantial Completion which, when signed by the Owner and the Contractor, documents the date of Substantial Completion of the Work or a designated portion of the Work. The Owner shall not consider the issuance of a Certificate of Occupancy by an outside authority a prerequisite for Substantial Completion if the Certificate of Occupancy cannot be obtained due to factors beyond the Contractor’s control.

- 37.5 Liquidated Damages may be deducted from the sum due to the Contractor for each calendar day that the Work remains uncompleted after the completion date specified in the Contract or an approved amended completion date. The dollar amount per day shall be calculated using the Schedule of Liquidated Damages table shown below.

If the original contract amount is:	The per day Liquidated Damages shall be:
Less than \$100,000	\$250
\$100,000 to less than \$2,000,000	\$750
\$2,000,000 to less than \$10,000,000	\$1,500
\$10,000,000 and greater	\$1,500 plus \$250 for each \$2,000,000 over \$10,000,000

38. Dispute Resolution

38.1 Mediation

- 38.1.1 A dispute between the parties which arises under this Contract which cannot be resolved through informal negotiation, shall be submitted to a neutral mediator jointly selected by the parties.

- 38.1.2 Either party may file suit before or during mediation if the party, in good faith, deems it to be necessary to avoid losing the right to sue due to a statute of limitations. If suit is filed before good faith mediation efforts are completed, the party filing suit shall agree to stay all proceedings in the lawsuit pending completion of the mediation process, provided such stay is without prejudice.

00 72 13
General Conditions

38.1.3 In any mediation between the Owner and the Consultant, the Owner has the right to consolidate related claims between Owner and Contractor.

38.2 Arbitration

38.2.1 If the dispute is not resolved through mediation, the dispute shall be settled by arbitration. The arbitration shall be conducted before a panel of three arbitrators. Each party shall select one arbitrator; the third arbitrator shall be appointed by the arbitrators selected by the parties. The arbitration shall be conducted in accordance with the Maine Uniform Arbitration Act (MUAA), except as otherwise provided in this section.

38.2.2 The decision of the arbitrators shall be final and binding upon all parties. The decision may be entered in court as provided in the MUAA.

38.2.3 The costs of the arbitration, including the arbitrators' fees shall be borne equally by the parties to the arbitration, unless the arbitrator orders otherwise.

38.2.4 In any arbitration between the Owner and the Consultant, the Owner has the right to consolidate related claims between Owner and Contractor.

00 73 46
Wage Determination Schedule

PART 1- GENERAL

1.1 Related Documents

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

1.2 Summary

- A. This Section includes the wage determination requirements for Contractors as issued by the State of Maine Department of Labor Bureau of Labor Standards or the United States Department of Labor.

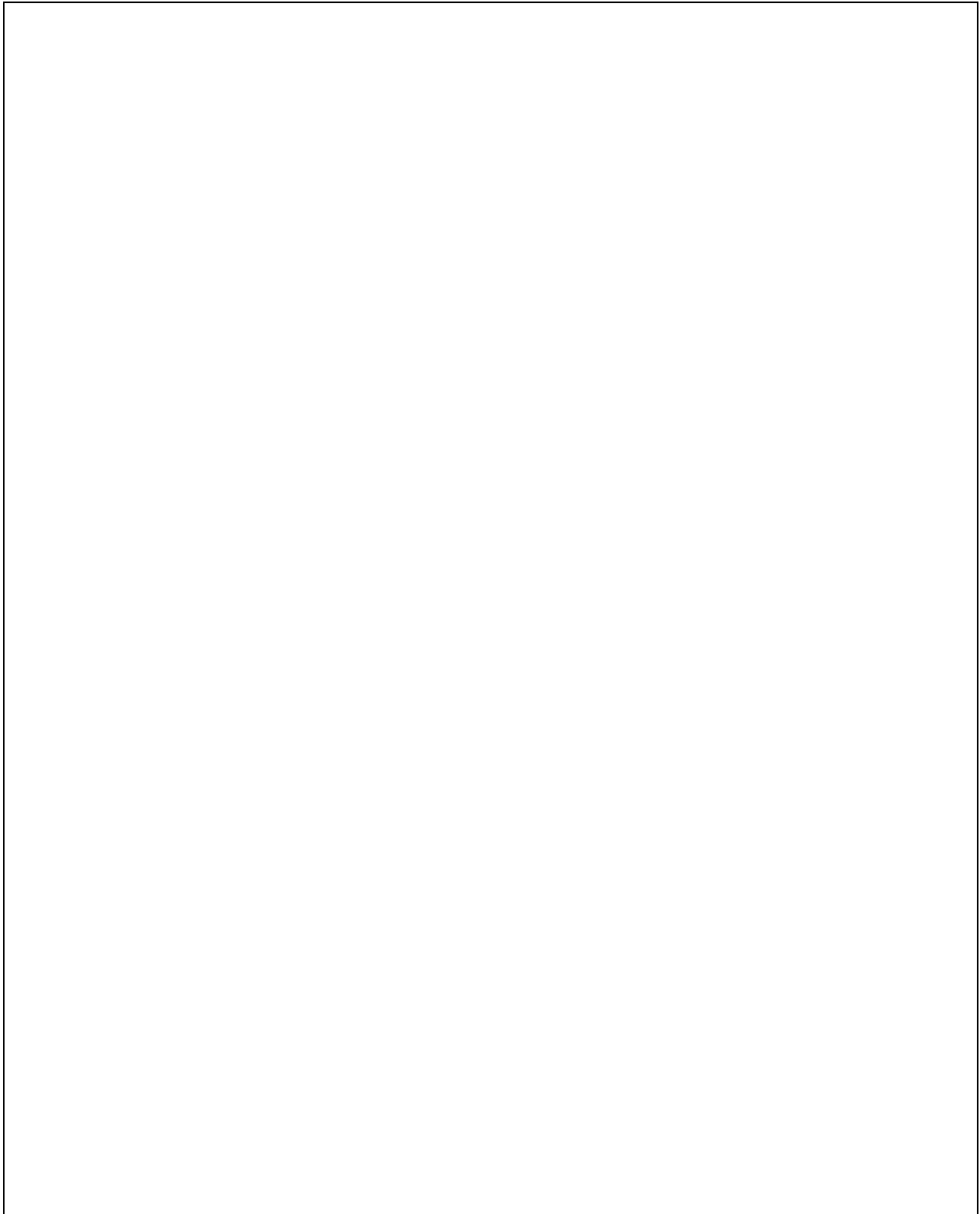
1.3 Requirements

- A. Conform to the wage determination schedule for this project which is shown on the following page.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

00 73 46
Wage Determination Schedule



End of Section 00 73 46

State of Maine
 Department of Labor
 Bureau of Labor Standards
 Augusta, Maine 04333-0045
 Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

**2022 Fair Minimum Wage Rates
 Highway & Earth Penobscot County**

Occupational Title	Minimum Wage	Minimum Benefit	Total
Carpenter	\$25.36	\$4.69	\$30.05
Cement Masons And Concrete Finisher	\$20.00	\$0.00	\$20.00
Commercial Divers	\$28.00	\$2.50	\$30.50
Construction And Maintenance Painters	\$23.34	\$2.53	\$25.87
Construction Laborer	\$20.00	\$0.00	\$20.00
Control And Valve Installers And Repairers - Except Mechanical Door	\$26.00	\$5.49	\$31.49
Conveyor Operators And Tenders	\$18.00	\$2.71	\$20.71
Crane And Tower Operators	\$31.54	\$6.68	\$38.22
Crushing Grinding And Polishing Machine Operators	\$21.00	\$6.36	\$27.36
Earth Drillers - Except Oil And Gas	\$23.25	\$5.53	\$28.78
Electricians	\$48.50	\$23.17	\$71.67
Excavating And Loading Machine And Dragline Operators	\$24.00	\$3.00	\$27.00
Fence Erectors	\$18.00	\$0.72	\$18.72
Flaggers	\$15.25	\$0.00	\$15.25
Heating And Air Conditioning And Refrigeration Mechanics And Installers	\$26.33	\$4.06	\$30.39
Heavy And Tractor - Trailer Truck Drivers	\$21.44	\$3.41	\$24.85
Highway Maintenance Workers	\$20.74	\$5.37	\$26.11
Industrial Machinery Mechanics	\$26.00	\$5.19	\$31.19
Industrial Truck And Tractor Operators	\$24.00	\$5.61	\$29.61
Light Truck Or Delivery Services Drivers	\$20.00	\$5.49	\$25.49
Millwrights	\$25.13	\$3.51	\$28.64
Mixing And Blending Machine Operators	\$24.71	\$13.50	\$38.21
Mobile Heavy Equipment Mechanics - Except Engines	\$24.71	\$3.30	\$28.01
Operating Engineers And Other Equipment Operators	\$23.75	\$3.24	\$26.99
Paving Surfacing And Tamping Equipment Operators	\$24.71	\$3.75	\$28.46
Pipelayers	\$28.00	\$7.20	\$35.20
Plumbers Pipe Fitters And Steamfitters	\$26.00	\$2.93	\$28.93
Reinforcing Iron And Rebar Workers	\$48.58	\$0.00	\$48.58
Structural Iron And Steel Workers	\$24.00	\$1.36	\$25.36

Welders are classified as the trade to which welding is incidental (e.g. welding structural steel is Structural Iron and Steel Worker)

Apprentices – The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

For any other specific trade on this project not listed above, contact the Bureau of Labor Standards for further clarification.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: Scott R. Cotnoir
 Scott R. Cotnoir
 Wage & Hour Director
 Bureau of Labor Standards

Expiration Date: 12-31-2022

SECTION 01100 - SUMMARY

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: Dorothea Dix Psychiatric Center (DDPC) Stormwater Utility Improvements
- B. Owner's Name: Dorothea Dix Psychiatric Center
- C. Owner's Contact: Mark Faulkner, Director of Facilities, 207-561-5516, mark.faulkner@maine.gov
- D. Engineer's Name: DuBois & King, Inc.; John Kenney, P.E., Project Manager, 36 Penn Plaza, Bangor, Maine 04401, 207-573-4130 extension 4702.
- E. This project includes the removal and replacement of two (2) catch basins, storm drain, culverts and asphalt pavement at the Dorothea Dix Psychiatric Center campus in Bangor, Maine.

1.02 RELATED SECTIONS

- A. None

1.03 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price as described in these Contract Documents.

1.04 DESCRIPTION OF WORK

- A. Scope of new construction work is shown in the Contract Documents. The work required by these Contract Documents shall include furnishing all labor, tools, equipment and materials and performing all necessary activities for completion of the Project, as shown in the Contract Documents.

1.05 OWNER OCCUPANCY

- A. Owner will occupy the project site throughout the construction period. Contractor shall coordinate and maintain good communications with DDPC staff continually throughout the construction period.

1.06 PROJECT/SITE CONDITIONS

- A. Project area is located within and along the northerly edge of an existing parking lot on the Dorothea Dix Psychiatric Center campus in Bangor, Maine. The site contractor shall erect a security barrier around the project area to clearly separate work area from public parking areas.

- B. The Drawings indicate the presence of existing pipelines and structures based on best available information, but the Contractor shall perform whatever field testing and verification is required to allow pipeline crossings or tie-ins, excavations, or other similar work tasks to be completed in the areas of existing buried utilities without damage to or interruption of operation.

1.07 CONTRACTOR USE OF SITE

- A. Time Restrictions:
 - 1. Limit work to the hours of 7:00 am to 7:00 pm.
- B. Limit shutdown of utility services to normal work hours, arranged at least 48 hours in advance with Owner, and schedule/plan the work to minimize the impacts to operations.

1.08 SUGGESTED WORK SEQUENCE

- A. The following information is provided for consideration by the Contractor.
 - 1. Contractor shall coordinate all work with Dorothea Dix Psychiatric Center Director of Facilities (Mark Faulkner, 207-561-5516).
 - 2. Install required security barriers around project work area.
 - 3. Install required erosion prevention and sediment controls.
 - 4. Verify existing survey control and lay out project. Verify measurements of existing features.
 - 5. Remove and replace culverts along northerly edge of parking lot. Construct new grass swales and install inlet and outlet protection.
 - 6. Sawcut and remove asphalt pavement as needed for catch basin, storm drain and culvert removal.
 - 7. Remove and replace catch basins, storm drain and culverts. Install inlet and outlet protection.
 - 8. Backfill with compacted granular material, place compacted hot mix asphalt pavement, and stripe following asphalt pavement curing period
 - 9. Complete final site restoration, including fine-grading, topsoil, seed and mulch and removal of EPSC measures once grass growth has been established.

Remove all equipment, refuse and excess materials from the site.

10. Submit any outstanding documentation including record drawings. Submit project closeout documents.

B. Coordinate construction schedule and operations with Engineer.

1. All work should be coordinated with Engineer and/or Owner daily.
2. Limit work hours to begin no earlier than 7:00 am except for emergency work or as otherwise approved in writing by the Owner.
3. Work may occur on weekends and legal holidays with Owner coordination.

1.08 OMISSIONS

A. The Contractor is responsible for the complete, fully functional, code-compliant installation of this project. Items, materials and activities commonly considered essential for completion of this type of work shall be provided by the Contractor at no additional cost to the Owner even if not specifically identified or shown in the Contract Documents.

1.09 QUALITY

A. Notwithstanding the quality requirements described in the Contract Documents, every aspect of the project shall be completed with good workmanship. All materials and equipment shall be new unless specifically stated otherwise in the Contract Documents. If the grade or quality of materials or equipment is not specified, it shall be of a quality sufficient for long-term reliable operation of the project.

1.10 PROTECTION TO PERSONS OR PROPERTY

A. The Contractor shall take every reasonable precaution against and assume all responsibility and liability for injury to persons and damage to public or private property caused directly or indirectly by the Contractor. Damages caused directly or indirectly by the Contractor shall be

remediated by the Contractor at no additional cost to the Owner.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01130 - SURVEYS AND LAYOUT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Quality Assurance.
- B. Products
- C. Execution

1.02 QUALITY ASSURANCE

- A. Contractor shall perform all survey work for laying out the Work, for measuring pay items, and for preparing Record Drawings. Work shall be done by a qualified Surveyor, as Chief of Party, and qualified assistants experienced in this type of work.
- B. Contractor is responsible for the accuracy of his own work and shall maintain all reference points, stakes, etc., throughout the life of the Contract.

1.03 SUBMISSIONS

- A. Copies of computations and reference points referenced below shall be submitted daily.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide all instruments, rods, measures, stakes, ribbons, nails and all other materials and equipment to perform the work of this Section.

PART 3 EXECUTION

3.01 INSPECTIONS

- A. Carefully examine the Drawings and immediately report to Engineer any error, apparent discrepancy in the data shown or omissions of data required for accurately accomplishing the Work.

3.02 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Engineer of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.

- D. Control datum for survey is that indicated on Drawings.
- E. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.
- G. Utilize recognized engineering survey practices.
- H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements: stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Waste gas burner and related infrastructure locations and elevations.
- I. Periodically verify layouts by same means.
- J. Maintain a complete and accurate log of control and survey work as it progresses.

3.03 MEASUREMENTS

- A. Make all measurements for payment purposes.
- B. Perform all surveys and make all measurements required for the record drawings.

3.04 FIELD NOTES AND COMPUTATIONS

- A. Make all computations necessary to establish the exact position of the Work. Maintain field notes of all ties, baselines, reference points, bench marks and other control points. Also maintain field notes of all data required to be shown on the record drawings.

3.05 TIES

- A. Property Monuments - Prior to any work in the vicinity of an existing property monument or marker, accurately provide at least four ties to physical objects which will not be damaged, destroyed or disturbed in the course of the Work.
- B. New Underground and Underwater Work - On all new Work which will be buried or submerged in water and will not be visible at the completion of the Work, such as ends of building

connections, stub-outs, dead ended pipes, and like objects, provide elevations and three ties to physical objects to facilitate the locating of such items at a later date.

3.06 REPLACEMENTS

- A. All existing and new reference points, ties, bench marks, property markers and other control points damaged, destroyed or disturbed during construction shall be reestablished and replaced.

END OF SECTION

SECTION 01150 - MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 DESCRIPTION

- A. This Section covers the requirements for measurements and records for payment purposes, and describes the items under which payments will be made for all work performed under this Contract.
- B. Items not specified to be measured or paid for shall be included in an appropriate unit price item or in a Lump-sum item.

1.02 MEASUREMENT REQUIREMENTS

- A. Where payments will be made for removing rock and existing materials, notify Engineer so that he may inspect the materials to be removed, so that he may witness the measuring, and so that he may approve the record of measurements. All materials removed without conforming to the above procedures, and which Engineer cannot verify or substantiate, will not be paid for.
- B. Maintain complete, neat, clean, and legible field notes for all measured items. Notes shall contain spaces for Contractor's and Engineer's signatures plus additional space for comments. An original and a copy shall be made for all notes and one copy shall be turned over to Engineer daily. The Engineer's signature shall not be construed as an acceptance of the Work, or the measurements made, but shall mean that he was present when the measurements were made.

1.03 SUBMITTALS

- A. See Section 01300.
- B. Field notes of all measurements for payment purposes delivered to Engineer daily.
- C. Copies of all invoices required for payments out of cash allowance(s).
- D. Monthly Applications for Payment, on the forms included under contract forms.

1.04 SCHEDULING

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

- B. Allow for and afford Engineer ample time, space and equipment to observe measurements and to verify measurements and elevations.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide all labor, materials, facilities, levels, measuring devices and all other equipment and items necessary to properly and accurately perform all measurements for payment purposes.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS & STIPULATIONS

- A. Perform all measuring required under this Section.
- B. No separate payments will be made for work under this Contract except for the pay items stipulated in this PART 3. All costs in connection with the Work shall be included in one or more of the pay items as appropriate.
- C. Each pay item shall be full compensation for all costs in connection with the item including but not limited to:
 - 1. The furnishing of all materials, labor, equipment, tools, and all incidentals.
 - 2. The installation of all materials, equipment, facilities, accessories and appurtenant items.
 - 3. The proper share of overhead and profit.
 - 4. Any excavation, trenching, backfilling, dewatering, shoring or testing required.
 - 5. The restoration of unpaved surfaces.
 - 6. Any temporary facilities or controls required including flaggers and/or uniformed traffic officers.
 - 7. All erosion and dust control measures.
 - 8. All related and incidental work and items necessary or required to complete the Work and to provide completely connected, operational and approved, code-compliant systems capable of performing as required.
 - 9. Clearing and grubbing.
- D. Each pay item which specifically involves excavation shall be considered to include full compensation for:
 - 1. Excavation in earth.
 - 2. Disposal of any surplus.
 - 3. Handling of water as specified.
 - 4. Installation and removal of sheeting and bracing.

- E. If solid rock excavation is required, additional compensation will be paid under the item Rock Excavation and Disposal, with the exception of items which specifically include payment for rock excavation.

3.02 MEASUREMENT & PAYMENT ITEMS

- A. The names of the following items are abbreviated forms of the Bid Items as contained on the Price Schedule in the Bid Form. The names, as shown below or on the Bid Form, shall not be construed to represent a complete description of all of the Work included under such items and are provided only as a means of identification and for ease of conversation.

1. STORMWATER UTILITY IMPROVEMENTS

No measurement required.

Payment shall be lump sum of all work described in the contract documents and as associated with the removal and replacement of existing catch basins, storm drain, culverts, and all related site work.

END OF SECTION

SECTION 01300 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preconstruction meeting.
- B. Site mobilization meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Progress photographs.
- F. Submittals for review, information, and project closeout.
- G. Number of copies of submittals.
- H. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 007213 - General Conditions.
- B. Section 01100 - Summary.
- C. Section 01700 - Execution Requirements: Additional coordination requirements.
- D. Section 01780 - Closeout Submittals: Project record documents.

1.03 PROJECT COORDINATION

- A. Project Coordinator: Engineer's Construction Manager and/or Resident Engineer.
- B. Coordinate with Owner representative in identification of mobilization and storage areas, field office locations, site access, traffic, and parking facilities.
- C. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- D. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- E. Make the following types of submittals to Engineer:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.

6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Closeout submittals.
11. Operation and Maintenance Manuals.
12. Record Drawings and Field Ties.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. Engineer will schedule a meeting after Notice of Award.
- B. Attendance Required:
 1. Representative of Owner.
 2. Engineer's manager and Resident Project Representative.
 3. Contractor's Project manager and Superintendent.
 4. Representative of Funding Agency.
- C. Agenda:
 1. Execution of Owner-Contractor Agreement.
 2. Submission of executed bonds and insurance certificates.
 3. Distribution of Contract Documents.
 4. Submission of list of Subcontractors, schedule of values, and progress schedule.
 5. Designation of personnel representing the parties to Contract.
 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 7. Scheduling.
 8. Other Contract Document or construction coordination items, as required.
- D. Engineer will record minutes and distribute copies within seven days after meeting to participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

- A. Owner will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
 1. Contractor's Superintendent.
 2. Owner Representative.

3. Resident Project Representative.
- C. Agenda:
1. Use of premises by Owner and Contractor.
 2. Owner's requirements.
 3. Construction facilities.
 4. Temporary utilities.
 5. Security and housekeeping procedures.
- D. Resident Project Representative will record minutes and distribute copies within three days after meeting to participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

- A. Engineer will schedule and administer meetings throughout progress of the Work at regular intervals.
- B. Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Contractor's project manager and superintendent, major Subcontractors and suppliers, Owner Representative, and Engineer's project manager and Resident Project Representative.
- D. Agenda:
1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems which impede planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
- E. Engineer will record minutes and distribute copies within seven days after meeting to participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

- A. Submit preliminary schedule at the Preconstruction Meeting defining planned operations for the first 30 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 5 days.
- C. Within 10 days after review of preliminary schedule, submit proposed complete schedule for review.
- D. Submit updated schedule with each Application for Payment.
- E. Submit updated Schedule with each Change Order.

3.05 PROGRESS PHOTOGRAPHS

- A. Provide photographs of site and construction throughout progress of Work.
- B. Take photographs each month on the following:
 - 1. Site clearing.
 - 2. Excavations.
 - 3. Final completion.
- C. Take photographs as evidence of existing project conditions. Photos shall be stored in electronic file format, in a digital .jpg file format. Files shall be organized by date and/or activity.
- D. Digital photo files shall be made available to the Engineer, at the Engineer's request.
- F. Deliver all digital photo files to Engineer with project record documents. Catalog and index files in chronological sequence; provide table of contents.

3.06 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Engineer for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.

- D. Provide copies in accordance with SUBMITTAL PROCEDURES article below.

3.07 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.
- B. Submit to Engineer for Record Purposes.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Spare Parts Lists and Tools.
 - 4. Warranties.
 - 5. Bonds.
 - 6. Other types as indicated.
- B. Submit to Engineer for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

- A. Documents for Review:
 - 1. Small Size Sheets, Not Larger Than 11 x 17 inches (280 x 432mm): Submit the number of copies which the Contractor requires, plus four which will be retained by the Engineer.
 - 2. Larger Sheets, Not Larger Than 36 x 48 inches: Submit one reproducible transparency.
- B. Documents for Information: Submit two copies.
- C. Documents for Project Closeout: See Section 01780
- D. Samples: Submit the number specified in individual specification sections;
 - 1. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

- A. Transmit each submittal with the Contractor's standard project submittal cover page form that includes the information or identification noted below.
- B. Sequentially number the submittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor, or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- D. Apply Contractor's stamp on each copy of each submittal, signed or initialed certifying that the product is in accordance with the requirements of the Work and Contract Documents. The stamp shall have the following wording: "I hereby certify that I have carefully examined the enclosed submittal(s) and have determined and verified all field measurements, construction criteria, materials, catalog numbers and similar data, coordinated the submittal(s) with other submissions and the work of other trades and contractors, and that to the best of my knowledge and belief, the enclosed submittal(s) is/are in full compliance with the Contract requirements, except as follows (enter NONE if there are no exceptions):"
- E. Deliver submittals to Engineer by email in pdf file format or consult Engineer for approval of an alternative method of sending.
- F. Schedule submittals to expedite the Project, and coordinate submission of related items.
- G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- H. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- I. Provide space for Engineer's review stamp.
- J. Submit copies that are clear and legible. Copies will be returned unreviewed if this requirement is not met.
- K. When revised for resubmission, identify all changes made since previous submission.
- L. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

- M. Submittals not requested will not be recognized or processed.
- N. Engineer will review and comment on each submission. Engineer's review will be only for conformance with the design concept of the Project and will be confined to general arrangement and compliance with the Contract Documents only, and will not be for the purpose of checking dimensions, weights, clearances, fitting, tolerances, interferences, or coordination of trades or contractors. The acceptance of a separate item does not represent acceptance of an assembly in which the item functions. Engineer's review and comments will in no way relieve Contractor of any of his responsibilities under the Contract.
- O. Engineer will mark Submittals as follows:
 - 1. Accepted - Submittal appears to conform to Contract Documents and Contractor may proceed with ordering and installation.
 - 2. Accepted As Noted - Same as "Accepted", except it is accepted on the basis that the modifications or notes added to the submittal by Engineer will be complied with by Contractor.
 - 3. Revise and Resubmit - Submission is not acceptable and shall be revised and resubmitted by Contractor.
 - 4. Rejected - Submission is unacceptable as it does not appear to conform to the Contract Documents. A completely new submission of other equipment or different materials is required.
 - 5. Not Reviewed - Submission has not been reviewed by the Engineer for conformance to the Contract Documents.
 - 6. For Record Only - Submission was not required for product for review by Engineer, or, submission was not reviewed by Engineer prior to installation but is marked for Record for conformance with Contract Documents.
- P. No payment will be made on any item for which a submission is required if such submission:
 - 1. has not been made,
 - 2. has been made but was not stamped "Accepted" by Engineer,
 - 3. has been made and stamped "Accepted As Corrected," but Contractor has not complied with Engineer's notes marked on the submittal,

4. has been made and stamped "Accepted," but item provided does not conform to the shop drawing nor to the Contract Documents.
- Q. Engineer's acceptance of submittals shall not relieve Contractor of responsibility for any deviation from the requirements of the Contract Documents unless Contractor has informed Engineer, in writing, of such deviation at the time of submission and Engineer has given written acceptance to the specific deviation, nor shall Engineer's acceptance relieve Contractor from responsibility for errors or omissions in the submittals.
- R. No portion of the Work requiring a submission shall be commenced until the submission has been accepted by Engineer.

END OF SECTION

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance submittals.
- B. Mock-ups.
- C. Control of installation.
- D. Tolerances.
- E. Inspection services.
- F. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

- A. Section 01300 - Administrative Requirements: Submittal procedures.
- B. Section 01425 - Reference Standards.
- C. Section 01600 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

- A. ASTM C 1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2001.
- B. ASTM C 1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2003a.
- C. ASTM C 1093 - Standard Practice for Accreditation of Testing Agencies for Unit Masonry; 1995 (Reapproved 2001).
- D. ASTM D 3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2001.
- E. ASTM E 329 - Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction; 2003.
- F. ASTM E 543 - Standard Practice for Agencies Performing Nondestructive Testing; 2002.
- G. ASTM E 548 - Standard Guide for General Criteria used for Evaluating Laboratory Competence; 1994.

1.04 SUBMITTALS

- A. Testing Agency Qualifications:

1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time personnel with their listed certifications and responsible officer.
- B. Test Reports: After each test/inspection, promptly submit two copies of report to Engineer.
 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Conformance with Contract Documents.
 - k. When requested by Engineer, provide interpretation of results.
 2. Test reports are submitted for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and/or installation/application subcontractor to Engineer.
 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to the Engineer. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- E. Manufacturer's Field Reports: Submit reports for Engineer's benefit as contract administrator or for Owner.

1. Submit report in duplicate within 10 days of observation to Engineer.
 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- F. Erection Drawings: Submit drawings for Engineer's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
 2. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

1.05 REFERENCES AND STANDARDS - See Section 01425

1.06 TESTING AND INSPECTION AGENCIES

- A. **Contractor shall employ and pay for services of an independent testing agency to perform specified testing.**
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E 329, ASTM E 543, ASTM C 1021, ASTM C 1077, ASTM C 1093, and ASTM D 3740.
 2. Laboratory: Authorized to operate in State in which Project is located.
 3. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 4. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.

- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.03 TESTING

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 1. Test samples of mixes submitted by Contractor.
 2. Provide qualified personnel at site. Cooperate with Engineer and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified standards.
 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify Engineer and Contractor of observed irregularities or non-conformance of Work or products.
 6. Perform additional tests required by Engineer.
 7. Submit reports of all tests performed.
- C. Limits on Testing Agency Authority:

1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested.
 - b. To obtain and handle samples at the site or at source of Products to be tested.
 - c. To facilitate tests.
 - d. To provide storage and curing of test samples.
 4. Notify Engineer and laboratory 24 hours prior to expected time for operations requiring testing services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples and tests, required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Engineer. Payment for re testing shall be paid by the Contractor.

3.04 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to instruct Owner in proper operation and Maintenance procedures and requirements.
- B. Submit qualifications of observer to Engineer 15 days in advance of required observations.
 1. Observer subject to approval of Engineer.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

- D. Submit a "Certificate of Compliance" attached hereto, or reasonable facsimile.

3.05 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Engineer, it is not practical to remove and replace the Work, Contractor shall propose an appropriate remedy for review and acceptance by Engineer, or if acceptable to Owner, accept an adjustment in payment.

END OF SECTION

SECTION 01425 - REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements relating to referenced standards.
- B. Reference standards full title and edition date.

1.02 RELATED SECTIONS

- A. Section 007213 - General Conditions.

1.03 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Contract Document, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date for receiving bids or specified in the individual specification, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by the Contract Documents.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Engineer before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Engineer shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 The following is a partial list of abbreviations which may be used in the Specifications, and the organizations to which they refer:

AA -- ALUMINUM ASSOCIATION, INC.

AAN -- AMERICAN ASSOCIATION OF NURSERYMEN

AASHTO -- AMERICAN ASSOCIATION OF STATE HIGHWAY AND
 TRANSPORTATION OFFICIALS
 ACI -- AMERICAN CONCRETE INSTITUTE
 AGA -- AMERICAN GAS ASSOCIATION
 AIA -- AMERICAN INSTITUTE OF ARCHITECTS
 AISC -- AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.
 AISI -- AMERICAN IRON AND STEEL INSTITUTE
 AMCA -- AIR MOVEMENT AND CONTROL ASSOCIATION
 INTERNATIONAL, INC.
 ANSI -- AMERICAN NATIONAL STANDARDS INSTITUTE
 AREA -- AMERICAN RAILWAY ENGINEERING ASSOCIATION
 ARI -- AIR-CONDITIONING AND REFRIGERATION INSTITUTE
 ASA -- ACOUSTICAL SOCIETY OF AMERICA
 ASHRAE -- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND
 AIR-CONDITIONING ENGINEERS, INC.
 ASME -- THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
 ASTM -- AMERICAN SOCIETY FOR TESTING AND MATERIALS
 AWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION
 AWS -- AMERICAN WELDING SOCIETY
 AWWA -- AMERICAN WATER WORKS ASSOCIATION
 CBM -- CERTIFIED BALLAST MANUFACTURERS
 DHUD -- U.S. DEPARTMENT OF HOUSING & URBAN DEVELOPMENT
 EIA -- ELECTRONIC INDUSTRIES ASSOCIATION
 EPA -- U.S. ENVIRONMENTAL PROTECTION AGENCY (USEPA)
 ETL -- ETL TESTING LABORATORY
 FM -- FACTORY MUTUAL RESEARCH CORPORATION
 FmHA -- FARMERS HOME ADMINISTRATION, U.S. DEPARTMENT OF
 AGRICULTURE
 FS -- FEDERAL SPECIFICATION
 IBR -- INSTITUTE OF BOILER AND RADIATOR MANUFACTURERS
 IEEE -- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
 IPCEA -- INSULATED POWER CABLE ENGINEERS ASSOCIATION
 NBFU -- NATIONAL BOARD OF FIRE UNDERWRITERS

NBS -- NATIONAL BUREAU OF STANDARDS
NECA -- NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEWWA -- NEW ENGLAND WATER WORKS ASSOCIATION
NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION
NSF -- NSF INTERNATIONAL (National Sanitation Foundation)
OSHA -- U.S. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
PCA -- PORTLAND CEMENT ASSOCIATION
PCI -- PRECAST/PRESTRESSED CONCRETE INSTITUTE
PS -- PRODUCT STANDARD
SCS -- U.S. SOIL CONSERVATION SERVICE
SDI -- STEEL DOOR INSTITUTE
SJI -- STEEL JOIST INSTITUTE
UBC -- UNIFORM BUILDING CODE
UL -- UNDERWRITERS LABORATORIES, INC.
WWPA -- WESTERN WOOD PRODUCTS ASSOCIATION

END OF SECTION

SECTION 01450 - ABBREVIATIONS AND SYMBOLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Common abbreviations and symbols and their meanings which are used throughout the Contract Documents.

1.02 RELATED SECTIONS

- A. Section 01425 - Reference Standards.

1.03 OTHER REFERENCES

- A. Other abbreviations and symbols may be found in legends and elsewhere on the Drawings. Piping material abbreviations are contained in the piping Sections.
- B. Should an abbreviation or symbol not be specifically defined, it shall carry the standard definition commonly used in the industry.
- C. Whenever any doubt arises as to what an abbreviation or symbol means, notify Engineer and he will issue a definition in writing.

1.04 ABBREVIATIONS

- A. The following is a list of commonly used abbreviations which may be found in the Contract Documents, and the meanings ascribed to them:

A.C. or ac	Alternating Current
a or A	Amperes
AFF	Above Finished Floor
amp or AMP	Amperes
Alum.	Aluminum
Asph.	Asphalt
Aux.	Auxiliary
AWG	American or Brown and Sharp Wire Gage
Bit. Conc.	Bituminous Concrete
Btu	British Thermal Unit
CB	Circuit Breaker
Cl.	Class
cm	Centimeter
C.O.	Cleanout
Conc.	Concrete
Cont.	Continuous
Cu.	Cubic
cc	Cubic Centimeters
C.F.	Cubic Feet
CFM or cfm	Cubic Feet Per Minute

CFS or cfs	Cubic Feet Per Second
C.Y.	Cubic Yards
CT	Current Transformer
D.C. or dc	Direct Current
Dia.	Diameter
DWG. or Dwg.	Drawing
Dr.	Drive
Ea. or ea.	Each
EF	Each Face
EW	Each Way
Eff. or eff.	Efficiency
El. or Elev.	Elevation
Fin. Gr.	Finished Grade
fps	Feet Per Second
Ft. or ft.	Feet
ftg.	Footing
g.	Grams
Ga. or ga.	Gauge
Gal. or gal.	Gallon
Galv.	Galvanized
GPD or gpd	Gallons Per Day
GPM or gpm	Gallons Per Minute
H-O-A	Hand-off-automatic
Hz. or hz.	Hertz
I.D.	Inside Diameter
Inv.	Invert
IP	Instrument Panel
KVA or kva	Kilovolts-amperes
Kw or kw	Kilowatts
Kwh or KWH	Kilowatt-hours
Lbs. or lbs.	Pounds
L.F.	Linear Feet
LPA	Lighting Panel "A"
L.S.	Lump Sum
m.	Meters
mA.	Milliamperes
Max. or max.	Maximum
MCC	Motor Control Center
Mfbm	Thousand Foot-Board Measure
mg.	Milligrams
MGD or mgd	Million Gallons Per Day
mi.	Miles
Min. or min.	Minimum
mm	Millimeters
No. or no.	Number
nom.	Nominal
NPT	National Pipe Thread

N.T.S.	Not to Scale
O.D.	Outside Diameter
OS&Y	Outside Screw and Yoke
Oz. or oz.	Ounce
pb	Pushbutton
PPD	Pounds Per Day
P/B	Pullbox
pri.	Primary
psf	Pounds Per Square Foot
psi	Pounds Per Square Inch
psig	Pounds Per Square Inch, Gauge Pressure
PT	Potential Transformer
Pvt. or Pvmt.	Pavement
R.	Radius
R.O.W.	Right-of-Way
scfm	Standard Cubic Feet per minute
Sch.	Schedule
sec.	Secondary or Seconds
Sq. or sq.	Square
S.F.	Square Feet
S/S/P	Stop-start-pilot Station
Std. or std.	Standard
S.Y.	Square Yards
T&B	Top and Bottom
Typ.	Typical
U.O.N.	Unless Otherwise Noted
V or v	Volts
Vac or VAC	Alternating Current Voltage
Vdc or VDC	Direct Current Voltage
V.F.	Vertical Feet
Vol.	Volume
W or w	Watts
w.c.	Water Column
WSP	Working Steam Pressure
Yd. or yd.	Yards

1.05 SYMBOLS

- A. The following is a list of commonly used symbols which may be found in the Contract Documents, and the meanings ascribed to them:

	Phase, Diameter, or Round (as applicable)
°	Degrees (F. = Fahrenheit C. = Centigrade)
'	Feet or Minutes
"	Inches or Seconds
#	Number or Pound
/	Per or Divided By

4:1 4 horizontal to 1 vertical, slope
1 on 4 1 vertical on 4 horizontal, slope

END OF SECTION

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Traffic Control
- G. Waste removal facilities and services.
- H. Project identification sign.
- I. Field offices.

1.02 RELATED REQUIREMENTS

- A. Section 01510 - Temporary Utilities.

1.03 TEMPORARY UTILITIES - See Section 01510

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
- B. Existing facilities may not be used.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing facilities is not permitted.
- C. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

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

1.06 FENCING

- A. Construction: Contractor's option.

1.07 SECURITY

- A. Provide security measures to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner.

1.08 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide means of removing mud from vehicle wheels before entering streets.
- C. Designated existing on-site roads may be used for construction traffic.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.09 TRAFFIC CONTROL

- A. Maintenance of Traffic
 - 1. Provide and maintain strong, suitable and safe temporary crossings and detours over and around the Work as necessary to maintain access to public and private property and to maintain pedestrian and vehicular traffic.
 - 2. Fire hydrants, water holes, and other sources of water for fire protection, on or adjacent to the Project site, shall be kept accessible to fire apparatus, and no obstructions shall be placed within ten (10) feet of any such source.
- B. Warning Signs
 - 1. Provide warning signs, detour signs and other traffic control devices to insure the safety of the public and to adequately direct traffic around the Work.
- C. Lighting
 - 1. Illuminate barricades, obstructions, and warning and detour signs, from sunset to sunrise.

1.10 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.

1.11 PROJECT IDENTIFICATION - NOT REQUIRED

- A. Provide Project Identification Sign if required in the Front End Documents.
- B. No other signs are allowed without Owner permission except those required by law.

1.12 FIELD OFFICES - NOT REQUIRED

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition or better.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01510 - TEMPORARY UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

- A. Section 01500 - Temporary Facilities and Controls: Telephone service for administrative purposes, facsimile service for administrative purposes, and temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY

- A. Cost: By Contractor.
- B. Provide power service required from utility source.
- C. Power Service Characteristics vary with project location coordinate with Owner, and Owner's power provider.
- D. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- E. Permanent convenience receptacles may not be utilized during construction.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain lighting for construction operations.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Permanent building lighting may not be utilized during construction.

1.05 TEMPORARY HEATING

- A. Cost of Energy: By Contractor.
- B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
- C. Existing facilities shall not be used.

1.06 TEMPORARY COOLING

- A. Cost of Energy: By Contractor.

- B. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- C. Existing facilities shall not be used.

1.07 TEMPORARY VENTILATION

- A. Existing ventilation equipment may not be used.

1.08 TEMPORARY WATER SERVICE

- A. Cost of Water Used: By Contractor.
- B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
- C. Connect to existing water source.
 - 1. Exercise measures to conserve water.
 - 2. Coordinate connection with Owner in accordance with municipal standards and codes.
 - 3. Provide separate metering and reimburse Owner for cost of water used.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations and procedures.
- F. Procedures for Owner-supplied products.
- G. Spare parts and maintenance materials.

1.02 RELATED REQUIREMENTS

- A. Section 01400 - Quality Requirements

1.03 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Notice to Proceed.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- E. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. All products shall be new and unused. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Provide interchangeable components of the same manufacture for components being replaced.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Provide spare parts, maintenance, and extra products of types and in quantities specified in individual specification sections.
- B. Deliver to Project site.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

- A. Engineer will consider requests for substitutions only within 30 days after date of Notice to Proceed.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 2. Will provide the same warranty for the substitution as for the specified product.
 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 5. Will reimburse Owner for review or redesign services associated with the substitution.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
 2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
 3. The Engineer will notify Contractor in writing of decision to accept or reject request.

3.02 TRANSPORTATION AND HANDLING

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- I. Prevent contact with material that may cause corrosion, discoloration, or staining.
- J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Pre-installation meetings.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Demonstration and instruction of Owner personnel.
- H. Closeout procedures, except payment procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01130 - Surveys and Layouts
- B. Section 01300 - Administrative Requirements: Submittals procedures.
- C. Section 01400 - Quality Requirements: Testing procedures.
- D. Section 01510 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
- E. Section 01780 - Closeout Submittals: Project record documents, operation and maintenance manuals, warranties, and substantial and final completion requirements.
- F. Individual Product Specification Sections:

1.03 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Survey work: See section 01130 - Surveys and Layouts
- C. Cutting and Patching: Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.

3. Efficiency, maintenance, or safety of any operational element.
4. Visual qualities of sight exposed elements.
5. Work of Owner or Contractor.
6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on work of Owner or separate Contractor.
 - g. Written permission of affected separate Contractor.
 - h. Date and time work will be executed.

1.04 QUALIFICATIONS

- A. For Survey work, see Section 01130;
- B. For field engineering, employ a Professional Engineer of the discipline required for specific service on Project, licensed in the State of Maine.

1.05 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 1. Minimize amount of bare soil exposed at one time.
 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- G. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.06 COORDINATION

- A. Coordinate work of alterations and renovations to expedite completion.
- B. Coordinate scheduling, submittals, and work of the various sections of the Contract Documents to ensure efficient and orderly sequence of installation of interdependent construction elements.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01600.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that demolition is complete in alterations areas and areas are ready for installation of new work.
- C. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- D. Examine and verify specific conditions described in individual specification sections.
- E. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.
- F. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- G. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Cut, move, or remove items as necessary for access to alterations and renovation work. Replace and restore at completion.

- B. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished work.
- C. Remove debris and abandoned items from area and from concealed spaces.
- D. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity. Insulate ducts and piping to prevent condensation in exposed areas.
- E. Prepare surfaces and remove surface finishes to provide for proper installation of new work and finishes.
- F. Clean substrate surfaces prior to applying next material or substance.
- G. Seal cracks or openings of substrate prior to applying next material or substance.
- H. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within three days after meeting to participants, with copies to Engineer, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Engineer of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.

- D. Control datum for survey is that indicated on Drawings.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- F. Promptly report to Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.
- H. Utilize recognized engineering survey practices.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and other structures or piping systems.
- J. Periodically verify layouts by same means.
- K. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as shown.
 2. Report discrepancies to Engineer before disturbing existing installation.
- B. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings.
 2. Relocate items indicated on drawings.
 3. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- C. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
- D. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finished that existing prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- E. Clean existing systems and equipment.
- F. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- G. Do not begin new construction in alterations areas before demolition is complete.
- H. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Execute cutting and patching to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement

adjacent work, and to fit products together to integrate with other work.

- B. Execute work by methods to avoid damage to other work, and which will provide appropriate surfaces to receive patching and finishing.
- C. Employ skilled and experienced installer to perform cutting.
- D. Cut rigid materials using appropriate saws or core drills. Pneumatic tools not allowed without prior approval.
- E. Restore work with new products in accordance with requirements of Contract Documents.
- F. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- G. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- H. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.

- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.
- H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 SYSTEMS STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer and owner five days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel 5 days prior to date of Substantial Completion.
- B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Provide a qualified manufacturer's representative who is knowledgeable about the Project to perform demonstration and instruction of owner personnel.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.
 - 1. Clean areas to be occupied by Owner prior to substantial completion.
- B. Use cleaning materials that are nonhazardous.
- C. Clean surfaces exposed to view; remove temporary labels and stains and foreign substances.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean debris from roofs, exposed surfaces, and drainage systems.

- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste, surplus materials, rubbish, and construction facilities from the site.

3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Engineer.
- B. Accompany Owner and Engineer at Substantial Completion inspection to determine items to be listed for completion or correction.
- C. Notify Engineer when work is considered ready for Substantial Completion.
- D. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- E. Accompany Owner and Engineer at Final Completion inspection.
- F. Notify Engineer when work is considered finally complete.
- G. Complete items of work determined by Engineer's final inspection.

END OF SECTION

SECTION 01780 - CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 007213 - General Conditions
- B. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01700 - Execution Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Engineer with claim for final Application for Payment.
- B. Operation and Maintenance Data: NOT APPLICABLE
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

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

2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed shop drawings, product data, and samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 2. Field changes of dimension and detail.
 3. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. NOT APPLICABLE

3.03 OPERATION AND MAINTENANCE MANUALS

- A. NOT APPLICABLE

3.04 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and Manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.

- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 x 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- 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 product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

3.05 SPARE PARTS AND MATERIALS

- A. NOT APPLICABLE

3.06 SPECIAL TOOLS

- A. NOT APPLICABLE.

3.07 LUBRICANTS AND FACILITIES STARTUP

- A. NOT APPLICABLE

END OF SECTION

SECTION 02015 - SUBSURFACE INFORMATION

PART 1 GENERAL

1.01 SUMMARY

- A. The Owner has not obtained any specific subsurface information concerning the Site as part of this project.
- B. The locations of subsurface features, including utilities, may be inaccurate. Some subsurface features may not be shown.
- B. No explicit or implicit guarantee exists that the indicated location, depths or nature of materials or features are complete or accurate. Conditions affecting the cost or quantity of the work may exist on the Site.
- C. The Contractor is responsible for any additional subsurface investigation necessary for the Contractor to complete the Work as required in the Contract Documents.
- D. The Contractor shall note subsurface features and conditions encountered during the work and provide this information to the Engineer.

1.02 DIGSAFE

- A. The Contractor is responsible for obtaining and maintaining DigSafe clearance of the Site for the duration of the Work. This includes maintenance of DigSafe markings.
- B. The Contractor is responsible for notifying any other public or private utilities on or near the Site that are not marked by DigSafe

1.03 UNDERGROUND UTILITY DAMAGE PREVENTION

- A. The Contractor shall expect to encounter and perform work near existing buried utilities, including electric, telecommunications, water, sewer and/or gas lines.
- B. If the Contractor damages a utility, the Contractor is responsible for repairing or replacing it, at no additional cost to the Owner.
- C. If the Contractor damages a utility, the Contractor shall immediately notify the owner of that utility.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 02225

DEMOLITION AND MODIFICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Demolition or modification of existing stormwater structures and facilities, complete, as shown on the Drawings and specified herein.

1.02 RELATED REQUIREMENTS

- A. Section 01500 – Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- B. Section 01600 – Product Requirements: Handling and storage of items removed for salvage and relocation.
- C. Section 01700 – Execution Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.

1.03 SUBMITTALS

- A. See Section 01300 Administrative Requirements, for submittal procedures.
- B. Demolition Plan: Not required.

1.04 QUALITY ASSURANCE

- A. Perform all work with workmen thoroughly experienced and skilled in such work.

1.05 PROJECT CONDITIONS

- A. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- B. Comply with other requirements specified in Section 01700.

1.06 DEFINITIONS

- A. Salvageable materials shall be all materials determined as such and designated on Drawings or identified by the Owner or Engineer. All salvageable material shall be the property of the Owner.
- B. Material generally considered non-salvageable shall include broken concrete, rubble, fractured bricks and blocks, trash, used building materials of no value, miscellaneous metals, fittings and piping as directed by Engineer.
- C. The Contractor shall be responsible for all costs of loading, hauling, dumping and otherwise transporting of all materials either salvageable or non-salvageable. The Contractor shall also be responsible for all charges and fees involved with disposing of materials in public or private landfills and/or dump areas. Contractor shall deliver identified salvageable material to the location identified by the Owner.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.01 GENERAL

- A. Submit to the Engineer, for Engineer's and Owner's information, the complete work procedure for modification or demolition. Plan all work so as to interfere with operation of existing facilities for the shortest time possible, and when demands on the system best permit such interference.
- B. Complete each step of the work procedure in one continuous operation. Assemble all tools, materials, equipment, and labor necessary to complete the work in the shortest possible time before starting any modification or demolition work. Do not leave any work unfinished for completion at a later time or date unless approved by the Engineer.

- C. Perform and accomplish all work with the time allotted in the work procedure.
- D. Clean from the immediate work area all materials removed from modified or demolished structures and dispose of them.
 - 1. Remove all salvageable materials from the site and store them at a location as directed by the Engineer.
 - 2. Legally dispose of all non-salvageable materials.
- E. Perform all demolition and modifications in such a manner as to leave a neat appearance when completed.
- F. Remove the minimum amount of existing work necessary for the installation of the new work. Cut the smallest amount possible consistent with the work to be done, but so as to provide an acceptable connection with first class workmanship. After new pipes or works are installed, carefully fit around, close up, and repair the pipes and miscellaneous work in such a manner as is satisfactory to the Engineer.

3.02 REPLACEMENTS

- A. Remove the existing equipment, and install in its place the new equipment as specified in other SECTIONS. Include in the installation all fittings and connections to existing equipment and systems so that the new equipment is fully operational.

END OF SECTION

SECTION 02230 - CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clearing and protection of vegetation.
- B. Temporary removal and replacement of walkways, structures, fences, walls or other site structures that interfere with project installation.

1.02 RELATED REQUIREMENTS

- A. Section 01100 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 01500 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- C. Section 01700 - Execution Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.
- D. Section 02270 - Erosion Control
- E. Section 02310 - Site Grading: Topsoil removal.
- F. Section 02315 - Excavation
- G. Section 02316 - Fill and Backfill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
- H. Section 02317 - Trenching for Site Utilities
- I. Section 02318 - Rock Removal
- J. Section 02901 - Restoration of Surfaces
- K. It is the intent of this Section to limit the area of clearing and grubbing to the minimum area possible to allow for the proper installation of the Work and to preserve all plantings, trees, shrubs, grass and natural vegetation to the maximum possible extent.

1.03 SUBMITTALS

- A. Section 01300 - Administrative Requirements, for submittal procedures.
- B. Contractor's schedule indicating dates upon which Contractor and Resident Engineer will traverse the site to allow Contractor to indicate the trees and plantings which he has determined to be necessary to remove and to obtain Resident Engineer's approval.

1.04 QUALITY ASSURANCE

- A. Confine clearing and grubbing operations to within the following limits:
 - 1. All areas where work is required to be done, but, to the minimum extent possible to properly install the work.
 - 2. Within the Grading Limits when shown on the Drawings.
 - 3. Within the easements provided by Owner.
 - 4. Within the property lines of lands owned by Owner.
- B. No trees, plants, shrubs, flowers or vegetables shall be removed or trimmed without the prior permission of the Resident Project Representative, except where otherwise specified.
- C. Provide at least one person who shall be present at all times during clearing and grubbing operations who shall be thoroughly familiar with the following:
 - 1. The types of trees and plantings encountered.
 - 2. The proper procedures and methods for taking-up and preserving trees and plantings.
 - 3. The proper procedures and methods for felling, trimming, pruning and caring for trees and plants and their roots.
- D. Clearing Firm: Company specializing in the type of work required.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store trees, plants and shrubs in protected areas and give ample water to keep them in a thriving condition for subsequent replanting.
- B. Store slate and flagstone sidewalk sections, granite and stone curbs, fences, signs, guide rails and other items at approved locations for subsequent reinstallation.
- C. Obstruction of roads, driveways, sidewalks, gutters and drainage ditches, swales and channels with stored materials is not permitted.

1.06 PROJECT CONDITIONS

- A. Burning of materials at the site is not permitted without the proper authorization of the appropriate local and state agencies.
- B. Materials not specified to be stored or reused shall be promptly removed and disposed of off-site.
- C. The locations of trees, plantings, vegetation, sidewalks, curbs and other living and nonliving items, as shown on the Drawings, have been determined by actual surveys at the time surveys were made. Since that time, additional items may have been built, some items may have been removed, and the condition of things may have changed. Carefully examine the site prior to bidding and become fully acquainted with the existing conditions as the Contract Price includes the cost for removing and replacing all obstacles and obstructions, as required, whether shown on the Drawings or not.
- D. Use all means necessary to protect existing objects designated to remain and, in the event of damage, immediately make all necessary repairs and replacements.
- E. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- F. Comply with other requirements specified in Section 01700.

1.07 SCHEDULING

- A. Avoid interference with the use of, and passage to and from, adjacent buildings, facilities, driveways, walks, drainage systems and road.
- B. Pavements which are required to be removed, including highways, driveways and walks, may be saw cut in advance, but do not remove until the work is ready to be installed.
- C. Do not remove highway signs, guide rails and all other control, safety and warning devices until just prior to the installation of the work.
- D. Do not remove fences until the property owners affected are notified at least four days in advance of such removal. Unless written permission from a fence owner is received, do not remove a fence more than 48 hours in advance of the installation of the work affecting the fence.

- E. It is the intent of this Section that all items affecting traffic, safety, lives and the containment of humans and animals and all items essential to the protection of property or the operation of a business be left in place as long as possible and replaced as soon as possible when such items must be removed.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Pruning Paint - Asphalt base paint specially formulated for horticultural application to cut or damaged plant tissue.
- B. Explosives - Explosives are not permitted for clearing and grubbing operations.
- C. Other Materials - All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by Contractor subject to the approval of Engineer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that all limiting boundaries such as permanent and temporary easements, property lines, rights-of-way and grading limits have been accurately located and clearly marked.
- B. Verify that pipeline routings and other items of work have been accurately located and clearly marked.

3.02 PREPARATION

- A. Mark all trees, plantings and other objects which are deemed necessary to be removed, trimmed, cut or taken-up and preserved.
- B. Notify and accompany Engineer through the site to inspect the items marked under Paragraph A, above. Describe which are to be trimmed, removed, and replanted and secure Engineer's approval.

3.03 CLEARING AND GRUBBING

- A. Clearing consists of cutting and disposing of all trees, down timber, stubs, brush, bushes, snags, rubbish, debris, and other objectionable matter and materials and the

removal and storage of fences, signs, walks, guide rails, curbs and other items to be restored.

- B. Grubbing consists of the removal and disposal of all stumps, roots, duff, foundations and other objectionable matter and materials.
- C. All operations shall be done in a manner so that present growth will blend with the limits of construction and a natural appearance will be attained.
- D. Employ whatever measures are necessary to avoid erosion.

3.04 VEGETATION

- A. In grassed, planted and open areas, do not remove or trim trees or plantings without the prior permission of Engineer. Take-up and preserve small trees, plantings, flowers and similar vegetation for reuse.
- B. In wooded areas, trees may be removed and/or trimmed, as required, for the proper installation of the work. Gross and unnecessary removal of trees is not permitted.
- C. If it is impractical to fall trees as a whole, remove them in sections according to standard practices of professional tree removal. Fall trees to the center of the area being cleared to minimize damage to trees that are to be left standing.
- D. Immediately after falling a tree, remove branches, cut trunk and limbs and remove all materials from the site.
- E. All trees to remain shall not come in contact with any machine or appliance that will in any manner injure, sear or kill them.
- F. Property owners shall have the right to cut and remove any wood in advance of the Contractor's operations. All other timber and wood which is removed shall become the property of the Contractor.
- G. All trees left standing which have been trimmed or become scarred by Contractor's operations shall be promptly repaired by properly cutting, smoothing and painting.
- H. Trees to be trimmed shall be evenly cut to achieve neat severance with the least possible damage to the tree.
- I. Where roots are cut or damaged, apply wet burlap to prevent drying out.

3.05 PAVEMENTS, WALKS, CURBS AND RAILS

- A. Remove existing pavements, walks and curbs to the limits shown on the Drawings, or if not shown to the minimum extent possible.
- B. Saw cut asphalt and concrete paved surfaces before removal. Use a saw which will cut a neat, straight joint line.
- C. Carefully remove slate and flag stone walks, granite and stone curbs and guide rails to the minimum extent possible. Terminate removals at a joint or guide rail post. Store and protect for reuse.

3.06 DISPOSAL

- A. Burning at the site is not permitted without the proper authorization of the appropriate local and state agencies.
- B. Burial of materials at the site is not permitted.
- C. All materials shall be promptly removed and disposed of away from the site.
- D. Methods of disposal shall conform to the requirements of all Federal, State and Local Laws and Ordinances.
- E. Leave Site in a neat and orderly condition.

3.07 PAVEMENTS, WALKS, CURBS AND RAILS

- A. Remove existing pavements, walks and curbs to the limits shown on the Drawings, or if not shown, to the minimum extent possible.
- B. Saw cut asphalt and concrete paved surfaces before removal. Use a saw that will cut a neat, straight joint line.
- C. Carefully remove slate and flag stone walks, granite and stone curbs and guide rails to the minimum extent possible. Terminate removals at a joint or post. Store and protect for reuse.

3.08 WALLS, FENCES, STRUCTURES AND OTHER CONSTRUCTIONS

- A. All walls, fences, signs, sheds, steps and other obstructions encountered shall be carefully taken up and stored for subsequent replacement.
- B. Do not disturb property markers unless absolutely necessary. If it becomes necessary to disturb or remove a property marker, have a qualified surveyor provide four

ties to the marker. The qualified surveyor shall replace the marker as soon as possible.

- C. Remove and dispose of all other obstructions which will affect the work or which are specifically designated to be removed.

3.09 PROTECTION

- A. Carefully protect and guard all trees, shrubs and vegetation and take every precaution to avoid damage to utilities, buildings and other property.
- B. Injured or damaged trees shall be repaired in accordance with EXTERIOIR PLANTS.
- C. All trees, shrubs or plantings which are taken up for subsequent reuse, and die, shall be replaced with first class balled and burlap.

3.10 REPLANTING AND RESTORATION OF SURFACES

- A. The requirements for replanting and restoration of surfaces are contained in RESTORATION OF SURFACES.

END OF SECTION

SECTION 02250 - SOIL COMPACTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements for soil compaction.

1.02 RELATED SECTIONS

- A. Division 2 - Site Work

1.03 SUBMITTALS

- A. Section 01300 - Administrative Requirements, for submittal procedures.
- B. List and description of proposed compaction equipment.
- C. Copies of the results of the laboratory sieve analyses and moisture density tests, certified by the Testing Laboratory.

1.04 QUALITY ASSURANCE

- A. The taking of samples and the performing of field compaction density tests shall be done by an independent testing laboratory.
- B. Provide at least one person who shall be present at all times during the soil compaction operations and who shall be thoroughly familiar with the various types of compaction equipment, proper compacting techniques and method, and soils behavior, and who shall direct the compaction operations.

1.05 PROJECT CONDITIONS

- A. Compaction shall not take place in freezing weather or when materials to be compacted are frozen, too wet or moist, or too dry.
- B. Schedule the Work to allow ample time for laboratory tests and to permit the collecting of samples and the performing of field density tests during the backfilling and compaction operations.
- C. Protect pipes, structures and all other subsurface work from displacement or injury during compaction operations.

PART 2 PRODUCTS

2.01 COMPACTION

- A. Utilize the proper compaction methods and equipment to suit the soils and conditions encountered.

2.02 LABORATORY TEST REPORTS

A. As a minimum, the laboratory moisture-density testing reports shall contain the following:

1. Name.
2. Date, time and specified location from which sample was taken and name of person who collected the sample.
3. Moisture - Density Curve plotted on graph paper to as larger as scale as practical with all points used to derive the curve being clearly visible.
4. Designation of the test method used.
5. The optimum density and moisture content.
6. A description of the sample.
7. The date the test was performed and the person who performed the test.
8. The Project name, identification and Contractor's name.
9. The signature of a responsible officer of the Testing Laboratory certifying to the information contained in the report.

B. As a minimum, the field compaction density testing reports shall contain the following:

1. Name.
2. Date, time, depth and specified location from which sample was taken and name of person who collected the sample.
3. Designation of the test method used.
4. Designation of the material being tested.
5. Test number.
6. In place dry density and moisture content.

7. Optimum density and moisture content.
8. Percentage of optimum density achieved.
9. The Project name, identification and Contractor's name.
10. The signature of a responsible officer of the Testing Laboratory certifying to the information contained in the report.

2.03 OTHER MATERIALS

- A. All other materials which are required to achieve adequate compaction shall be as selected by Contractor subject to approval of Engineer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that layers of material are no thicker than the maximum thickness specified in other Sections.
- B. Verify that moisture content is nearly optimum.
- C. Do not begin compaction operations until conditions are satisfactory.

3.02 PERFORMANCE

- A. Compaction densities shown are percentage of the maximum density obtainable at optimum moisture content as determined by ASTM D1557, Method C (Modified Proctor).
- B. Moisten or dry each layer of material to achieve optimum moisture content. Unless otherwise specified or directed by Engineer, compact each layer of material to the following required densities:

Location	Density
Under concrete slabs, foundations and footings	95%
Backfill around Structures	90%
Embankments	90%
Paved Areas	95%
All Other Areas	
Select Fill*	95%
Remainder of Trench	90%**

* Bedding, around pipes, over pipes and over sand encasements.

** Or density consistent with existing conditions.

3.03 FIELD QUALITY CONTROL

- A. Establish fill/backfill and compaction, equipment and procedures in the initial phases of each fill/backfill requirement. The intent is to determine that the methods of means will produce the densities specified.
- B. Perform a laboratory moisture density test for each type of soil proposed for use or encountered in the Work. Determine optimum moisture content in accordance with ASTM D1557, Method C.
- C. Engineer will designate the time, date and exact location of all field compaction density tests. Field density test may be ordered by Engineer in accordance with the following average frequencies:
 - 1. Under Structures - One test for every 400 square foot area of each layer of compacted granular fill.
 - 2. Outside of Structures - One test for each foot of backfill at intervals of approximately 50 feet around the structure.
 - 3. Trenches - One test for each foot of backfill at intervals of approximately 200 feet along the trench.
 - 4. Embankment - Six tests for each foot of compacted fill.
 - 5. Roads - One test for each layer of compacted fill and base material at intervals of approximately 200 feet along the roadway.
 - 6. Parking Areas and Sidewalks - One test for every 750 square foot area at parking areas and one test at intervals of 100 feet along sidewalks.
- D. Testing frequency indicated in 3.03 is at the discretion of the Engineer, and may be increased or decreased as the Engineer sees fit. Contractor to coordinate with the engineer a minimum of 48 hours prior to all applicable work to determine if compaction or moisture density testing will be necessary.

- E. Field density and moisture testing shall conform to the requirements of ASTM D1556 or D2922 and ASTM D3017. Soils shall be described in accordance with ASTM D2488, Visual-Manual Procedure.

3.04 COORDINATION

- A. Provide all assistance and cooperation during testing and coordination operations to allow ample time for the required sampling and testing.
- B. Perform field inspection and testing in accordance with Section 01400 - Quality Requirements.

3.05 ADJUST AND CLEAN

- A. Replace or repair any pipe, structure or other Work which has been displaced, damaged, or injured.
- B. Compacted soils not meeting compaction densities shall be re-excavated, re-compacted and retested at the Contractor's expense until all requirements are met.

END OF SECTION

SECTION 02270 - EROSION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prevention of erosion, siltation and sedimentation due to construction activities.
- B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
- C. Restoration of areas eroded due to insufficient preventive measures.
- D. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02 RELATED SECTIONS

- A. Section 02230 - Clearing and Grubbing: Limits of clearing; disposition of vegetative clearing debris.
- B. Section 02310 - Site Grading: Temporary and permanent grade changes for erosion control.
- C. Section 02921 - Topsoil and Seeding: Permanent turf for erosion control.

1.03 PERFORMANCE REQUIREMENTS

- A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control.
- B. Best Management Practices Standard: EPA 832-R-92-005.
- C. The Maine Department of Environmental Protection's "Maine Erosion and Sediment Control Practices Field Guide for Contractors" shall be utilized as a guide for the control of erosion on the site (www.maine.gov/dep/land/erosion/escbmps/esc_bmp_field.pdf). The Contractor shall be familiar with the standards and specifications in the Publication.
- D. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- E. Stormwater Runoff: Control increased stormwater runoff due to disturbance of surface cover due to construction activities for this project.

1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
- F. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
1. Control movement of sediment and soil from temporary stockpiles of soil.
 2. Prevent development of ruts due to equipment and vehicular traffic.
 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- G. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
1. Prevent windblown soil from leaving the project site.
 2. Prevent tracking of mud onto public roads outside site.
 3. Prevent mud and sediment from flowing onto sidewalks and pavement.
 4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- H. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including river, streams, lakes, ponds, open drainage ways, storm sewers, sanitary sewers.
1. If sedimentation occurs, install or correct preventative measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

- I. Dust Control: The Contractor shall prevent generation of dust deemed to be a nuisance or health hazard.
 - 1. Dirt, debris and other construction materials spilled onto paved surfaces shall be removed at the end of each work day, unless more frequent removal is required to prevent generation of dust.
 - 2. Disturbed surfaces shall be treated as necessary to prevent generation of any dust that creates a nuisance or health hazard. Treatments include mulching, wetting or treatment with calcium chloride.
 - 3. Calcium chloride shall not be used around concrete structures or on surfaces where bituminous or concrete materials will be placed. Care shall be used when applying calcium chloride around desirable or sensitive vegetation or near waterways.

- J. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.04 PROJECT REQUIREMENTS

- A. Take every reasonable precaution and do whatever is necessary to avoid any erosion and to prevent silting of rivers, streams, lakes, reservoirs, impoundments, and drainage ditches and swales.
- B. The exposure of uncompleted cut slopes, embankments, trench excavations, and site graded areas shall be kept as short as possible. Initiate seeding and other erosion control measured on each segment as soon as reasonably possible.
- C. Should it become necessary to suspend construction for any length of time, shape all excavated and graded areas in such a manner that runoff will be intercepted and diverted to points where minimal erosion will occur. Provide and maintain temporary erosion and sediment control measures, such as berms, dikes, slope drains, silt stops, and sedimentation basins, until permanent drainage facilities or erosion control features have been completed and are operative.
- D. Fine material placed or exposed during the work shall be so handled and treated as to minimize the possibility of its reaching any surface waters. Use diversion channels, dikes, sediment traps, or any other effective control measures.

- E. Provide silt stops wherever erosion control measures may not be totally capable of controlling erosion, such as in drainage channels and where steep slopes may exist.
- F. Before water is allowed to flow in any ditch, swale or channel, install the permanent erosion control measures in the waterway so that the waterway will be safe against erosion.
- G. Take special precautions in the use of construction equipment to minimize erosion. Do not leave wheel tracks where erosion might begin.
- H. Unless specifically required in the Contract Documents, the operation of mechanized equipment in watercourses is not permitted. Where work is required in watercourses, minimize the movement of equipment in the waters and remove falsework, pilings, debris, and other temporary work as soon as construction will allow.
- I. Wherever crossing of live streams are necessary, provide temporary culverts or bridges to allow equipment to cross them without fording them. Disturbance of lands and waters outside the limits of construction is prohibited, except as may be found necessary and approved by Engineer.
- J. The requirements of this Section also apply to Project related construction activities away from the Project site, such as at borrow pits, off-site storage areas, and haul and work roads.
- K. Mulching shall follow the seeding operation by not more than 24 hours.
- L. Should any protective measures employed indicate any deficiencies or erosion taking place, immediately provide additional materials or employ different techniques to correct the situation and to prevent subsequent erosion.
- M. Continue erosion control measures until the permanent measures have been sufficiently established and are capable of controlling erosion on their own.
- N. Comply with all Federal, State, and Local laws, ordinances, rules and regulations.
- O. Provide the Resident Engineer with a written plan of erosion control for the entire contract area.

1.05 SUBMITTALS

- A. Section 01300 - Administrative Requirements, for submittal procedures.

- B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

1.06 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during erosion control operations and who shall be thoroughly familiar with the types of materials being installed and the best methods for their installation and who shall direct all work performed under this Section.
- B. Material manufacturers and vendors shall be reputable, qualified firms regularly engaged in producing the required types of materials.
- C. Protect and maintain all areas disturbed by the Work, such that erosion is adequately controlled and silt and sediments are not allowed to flow into any watercourse, onto adjacent property, or into storm drains.

PART 2 PRODUCTS

2.01 HAY AND STRAW MULCH

- A. General - Hay and straw mulches shall be reasonably free from swamp grass, weeds, twigs, debris and other deleterious material, and free from rot, mold, primary noxious weed seeds, and rough or woody materials. Mulches containing mature seed of species which would volunteer and be detrimental to the permanent seeding, or would result in over seeding, or would produce growth which is aesthetically unpleasing, is not permitted.
- B. Hay Mulch - Properly aired native hay, Sudan grass hay, broomsedge hay, legume hay, or similar hay or grass mowings. When air-dried in the loose state, the contents of the representative bale shall lose not more than fifteen (15) percent of the resulting air-dry weight of the bale. Apply at the rate of 2 to 3 tons/Ac, or at 1.5 tons/Ac when a net or a mulch stabilizer is used to mulch.
- C. Straw Mulch - Threshed plant residue of oats, wheat, barley, rye or rice from which grain has been removed.

Apply at a rate of 2 to 3 tons/Ac, or at 1.5 tons/Ac when a net or a mulch stabilizer is used to the mulch.

- D. Mulch Stabilizers - "Curasol" applied at a rate of 40 gal/Ac, Dow "Mulch Binder" applied at a rate of 45 gal/Ac, or asphalt binder, AASHTO M140, Type SS-1 or RS-1 as applicable, applied at the rate of 4000 gal/Ac.
- E. Temporary Type Mulch Nets - Paper yarn, approximately 0.05 inches in diameter, woven into a net with approximately openings of 7/8 inches by 1/2 inches and weighing about 0.20 lbs/sy.
- F. Permanent Type Mulch Nets - "Vexar" or "Erosion-Net" plastic or nylon mesh netting with approximately openings of 3/8 inches or 3/4 inches.

2.02 MATTING/BLANKETS

- A. Nomenclature - The various materials under this Paragraph are sometimes referred to as "matting" and "blankets". These words are interchangeably used throughout this Section, but the meanings shall be the same.
- B. Excelsior Matting - Uniform web of interlocking wood excelsior fibers with a backing of mulchnet fabric on one side only. The mulchnet shall be woven of either twisted paper chord or cotton cord. Excelsior matting shall be furnished in rolled strips and shall conform to the following physical requirements.
 - Width -48 inches, plus or minus 1 inch
 - Weight -0.80 lbs/sy, plus or minus 5%
- C. Staples - No. 11 (or heavier) plain iron wire, made from at least 12 inch lengths of wire bent to form a "U" of 1-1/2 inches to 2 inches in width. Use longer staples for loose soils or where otherwise required.

2.03 SEED AND SOD FOR EROSION CONTROL

- A. Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, so not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
- B. For Temporary Control Use - annual or perennial ryegrass.
- C. For Permanent Control - See Section TOPSOIL AND SEEDING.

2.04 HAY BALES FOR EROSION CONTROL

- A. Hay bales shall not be used for erosion prevention and sediment control purposes except as mulch material.

2.05 SILT FENCES

Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths.

- A. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D 4751.
- B. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D 4491.
- C. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D 4355 after 500 hours exposure.
- D. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in machine direction; when tested in accordance with ASTM D 4632.
- E. Elongation: 15 to 30 percent, when tested in accordance with ASTM D 4632.
- F. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D 4533.
- G. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
- H. Manufacturers:
 - 1. Propex, Inc.; www.geotextile.com.
 - 2. TC Mirafi; www.tcmirafi.com.
 - 3. Propex, Inc.; www.fixsoil.com
- I. Silt Fence Posts: One of the following, minimum 5 feet long.
 - 1. Hardwood, 2 by 2 inches in cross section.

2.06 CHECK DAMS AND SEDIMENT BASINS

- A. Reference drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTATIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

- B. Construction Entrances: Traffic-bearing aggregate surface.

1. Width: As required; 20 feet (7 m), minimum.
2. Length: 50 feet (16 m), minimum.
3. Provide at each construction entrance from public right-of-way.
4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic land, with drain into sediment trap or basin.

- C. Linear Sediment Barriers: Made of silt fences.

1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - b. Along the top of the slope or top bank of drainage channels and swales that transverse disturbed areas.
 - c. Along the toe of cut slopes and fill slopes.
2. Space sediment barriers with the following maximum slope length upslope from barriers:
 - a. Slope of less than 2 percent: 100 feet (30 m).
 - b. Slope between 2 and 5 percent: 75 feet (23 m).

- c. Slope between 5 and 10 percent: 50 feet (15 m).
 - d. Slope between 10 and 20 percent: 25 feet (7.5 m).
 - e. Slope over 20 percent: 15 feet (4.5 m).
- D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
 - 1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so run off passes into inlet.
 - 2. Manufactured grate protection product that prevents sediment from entering catch basin.
- E. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and stormwater outlets.
- F. Soil Stockpiles: Protect using one of the following measures:
 - 1. Cover with polyethylene film, secured by placing soil or other anchoring devices on outer edges.
- G. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
- H. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. HAY AND STRAW MULCHING

- 1. Install hay or straw mulch immediately after each area has been properly prepared. When permanent seed or seed for temporary erosion control is sown prior to placing the mulch, place mulch on seeded areas within 24 hours after seeding. Engineer may authorize the blowing of chapped mulch provided that 95% of the mulch fibers will be 6 inches or more in length and that it can be applied in such a manner that there will be a minimum amount of matting that

would retard the growth of plants. Hay mulch should cover the ground enough to shade it, but the mulch should not be so thick that a person standing cannot see the ground through the mulch. Remove matted mulch or branches.

2. Where mild winds may blow the mulch, or when ground slopes exceed 15%, or when otherwise required to maintain the mulch firmly in place, apply a system of pegs and strings, a chemical stabilizer, or temporary type netting to the mulch. Unless otherwise directed, remove the stings and netting prior to the acceptance of the Work.
3. Where high winds exist, or heavy rainstorms are likely, or where ground surfaces are steep, or where other conditions require, apply temporary type netting over the mulch and take whatever measures are necessary to maintain the mulch firmly in place.
4. Unless otherwise specified, the use of permanent type netting is not permitted without the prior approval of Engineer.

B. MATTING/BLANKETS - GENERAL

1. The use of mulch with matting is not permitted, however, a 4 to 6 inch overlap of mulch over the edge of matting is permissible.
2. Prepare surfaces of ditches and slopes to conform to the grades, contours and cross sections shown on the Drawings and finish to a smooth and even condition with all debris, roots, stone, and lumps raked out and removed. Loosen the soil surface to permit bedding of the matting. Unless otherwise noted, place seed prior to the placement of the matting.
3. Unroll matting parallel to the direction of flow of water and loosely drape, without folds or stretching, so that continuous ground contact is maintained.
4. In ditches and swales, and on slopes, each upslope and each downslope end of each piece of matting shall be placed in a 6 inch trench, stapled at 12 inches on center, backfilled, and tamped. Similarly, bury edges of matting along the edges of catch basins and

other structures. Engineer may require that any other edge, exposed to more than normal flow of water, be buried in a similar fashion.

5. Tightly secure matting to the soil by staples driven approximately vertically into the ground, flush with the surface of the matting. In driving the staples, take care not to form depressions or bulges in the surface of the matting.
6. Decrease the specified spacing of staples when varying factors, such as the season of the year or the amount of water encountered or anticipated, requires additional anchoring.
7. Refer to the following paragraphs for additional requirements on the placement and stapling of matting.

C. JUTE MATTING

1. Where strips are laid parallel or meet, as in a tee, they shall be overlapped at least 4 inches. Overlap ends at least 6 inches, shingle fashion.
2. Space check slots, built at right angles to the direction of flow of water, so that one check slot or one end occurs within each 50 feet of length of slope. Construct check slots by placing a tight fold of matting at least 6 inches vertically into the ground. These shall be tamped the same as the upslope ends.
3. Press jute matting onto the ground with a light lawn roller or other satisfactory means.
4. On slopes flatter than 4:1, place staples not more than 3 feet apart in three rows, for each strip, with one row along each edge and one row alternately spaced down the center. On grades 4:1 or steeper, place staples in the same three rows, but spaced 2 feet. On lapping edges, double the number of staples, with the spacing halved. Ends of matting and all required check slots shall have staples placed every foot. Matting placed adjacent to boulders or other obstructions shall be stapled with no spaces between the staples.

5. Spread additional seed over jute matting, particularly those locations disturbed by the building of slots.

D. EXCELSIOR MATTING

1. Where strips of excelsior matting are laid end to end, abut the adjoining ends.
2. When adjoining rolls of excelsior matting are laid parallel to one another, abut the matting snugly.
3. On slopes flatter than 4:1, place staples not more than 3 feet apart in three rows, for each strip, with one row along each edge and one row alternately spaced down the center. On grades 4:1 or steeper, place staples in the same three rows, but spaced 2 feet. Ends of matting shall have staples placed every foot. Matting placed adjacent to boulders or other obstructions shall be stapled with no spaces between the staples.

E. EROSION CONTROL MULCHING BLANKET

1. Where one roll ends and a second roll begins, the upslope piece shall be brought over the end of the downslope roll so that there is a 12 inch overlap, placed in a 4 inch deep trench, stapled at 12 inches on center, backfilled and tamped.
2. On slopes where two or more widths of blankets are applied, the two edges shall be overlapped 4 inches and stapled at 12 inch intervals along the exposed edge of the lap joint.
3. Staple the body of the blanket in a grid pattern with staples 3 feet on center, each way.

F. SEED FOR EROSION CONTROL

1. Seeding for permanent erosion control shall be carried out in accordance with Section TOPSOIL AND SEEDING.
2. Areas which will be regraded or otherwise disturbed later during construction may be ordered to be seeded

with rye grass to obtain temporary control. The seed shall be sown at the rate of approximately one pound per 1,000 square feet, on the pure live seed basis.

G. SILT FENCES

1. Provide silt fences, as required, for the temporary control of erosion and to stop silt and sediment from reaching surface waters, adjacent properties, or entering catch basins, or damaging the Work.
2. Install silt fence as shown in the Maine Erosion Prevention and Sediment Control Field Guide.
3. Provide a sufficient length of fence to accommodate runoff without causing any flooding and to adequately store any silt, sediment, and debris reaching it.
4. Leave silt fences in place until permanent erosion control measures have stopped all erosion and siltation.

3.05 MAINTENANCE

- A. If any staples become loosened or raised, or if any matting becomes loose, torn or undermined, or if any temporary erosion and sediment control measures are disturbed, repair them immediately.
- B. If seed is washed out before germination, repair any damage, re-fertilize, and reseed.

- C. Maintain mulched and matted areas, silt stops, and other temporary control measures until the permanent control measures are established and no further erosion is likely.

END OF SECTION

SECTION 02310 - SITE GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal and storage of topsoil.
- B. Rough grading the site.
- C. Finish grading.
- D. Filling
- E. Riprapping
- F. Construction of embankments.

1.02 RELATED REQUIREMENTS

- A. Section 01400 - Quality Requirements
- B. Section 02230 - Clearing and Grubbing.
- C. Section 02250 - Soil Compaction
- D. Section 02270 - Erosion control
- E. Section 02315 - Excavation.
- F. Section 02316 - Fill and Backfill: Filling and compaction.
- G. Section 02317 - Trenching for Site Utilities: Trenching and backfilling for utilities.
- H. Section 02318 - Rock Removal.
- I. Section 02901 - Restoration of Surfaces
- J. Section 02921 - Topsoil and Seeding: Finish ground cover.

1.03 SUBMITTALS

- A. Section 01300 - Administrative Requirements
- B. Certified copies of all results of maximum density tests and field compaction density tests.
- C. Gradations of stone, gravel, and other materials proposed for use.
- D. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.04 QUALITY ASSURANCE

- A. All finished grades shall be as shown on the Drawings. Use a qualified surveyor to set all grade stakes and to ensure

that the resulting final grades are those which are required.

- B. When placing fill or constructing embankments, moisten or dry fill material to the proper moisture content as determined by ASTM D1557, Method C.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Delivery of borrow materials to the site or removal of spoil from the site shall be done in a manner which will not cause any nuisance or allow spillage of materials from the transporting vehicle.
- B. Store topsoil separately from all other excavated materials and preserve for reuse.
- C. Materials which are required to be stored shall be stored in an orderly manner and at a sufficient distance away from banks of excavations and trenches to avoid overloading and percent slides or cave-ins. Do not store materials on, over or adjacent to structures or utilities which may collapse due to the added weight.
- D. Promptly remove materials not specified to be stored or reused.
- E. Obstruction of roads, driveways, sidewalks or interference with drainage along gutters, ditches or drainage channels with stored material is not permitted. If materials cannot be stored at the site to avoid such obstructions and interferences, they shall be stored away from the site and brought back when and as needed.

1.06 PROJECT CONDITIONS

- A. Protect above- and below-grade utilities that remain.
- B. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping. These features are shown on Contract Drawings.
- C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from grading equipment and vehicular traffic.
- D. Keep ground surfaces well drained, but avoid erosion. Do not place fill in water or over ice or snow.
- E. Filling with frozen materials or when materials already in place are frozen, is not permitted.

1.07 SCHEDULING AND SEQUENCING

- A. Schedule the Work with Engineer and afford her/him adequate time and space to make all required inspections.
- B. Schedule work and coordinate operations with the approved testing laboratory. If the laboratory cannot be available to perform required tests, grading and filling operations may have to be delayed in order to accomplish certain field tests.

PART 2 PRODUCTS

2.01 FILL MATERIAL

- A. Topsoil: See Section 02921.
- B. Other Fill Materials: See Section 02316.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that all boundaries of temporary and permanent easements and property lines are clearly marked in the field and that the Work will not violate these boundaries.
- B. Verify that the clearing and grubbing operations have been completed.
- C. Ascertain and verify the locations and character of structures, underground lines and subsurface conditions and verify that the Work will not adversely affect them.
- D. Verify that grade stakes have been properly and accurately set.
- E. Do not begin operations until conditions are satisfactory.

3.02 STRIP AND STOCKPILE TOPSOIL

- A. Strip topsoil to its full depth within all areas to be excavated or graded and in areas to receive pavements, fills or embankments except where existing ground is to be left undisturbed.
- B. Store topsoil on-site, in storage piles. Keep topsoil separated from all other excavated materials and store free of roots or other desirable materials.

3.03 DISPOSAL OF MATERIALS

- A. Use approved on-site materials to the extent they are available. Promptly dispose of any excess materials, off-site.

- B. Remove from the site all unsuitable material. Do not store or stockpile unsuitable materials at the Project site and do not incorporate into the Work.

3.04 SITE GRADING

- A. Rough grade the portions of the site which must be raised or lowered in order to properly execute the work under other Sections.
- B. Uniformly grade the site to the lines, grades and elevations shown on the Drawings. Finished surfaces shall be reasonably smooth, compacted and free from irregular surface changes. Unless otherwise specified, the finish shall be equivalent to the ordinarily obtainable from either blade grader or scraper operations.
- C. In unpaved areas, except those to be riprapped, lined or specially treated, smooth the surface sufficiently for application of topsoil. The finished topsoil subgrade shall not be more than 1 inch above or below the established grade or cross section.
- D. In unpaved areas, the finished grades shown on the Drawings include a layer of topsoil. The thickness of the topsoil is specified on the Drawings, or if not shown, as specified in Part 3 of Section X.

3.05 ROUGH GRADING

- A. Remove topsoil from areas to be excavated for sanitary sewer alignments, without mixing with foreign materials.
- B. Do not remove topsoil when wet.
- C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.
- D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.
- E. When excavating through roots, perform work by hand and cut roots with sharp axe.
- F. Benching Slopes: Horizontally bench existing slopes greater than 1:4 to key fill material to slope for firm bearing.
- G. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.06 EMBANKMENT CONSTRUCTION

- A. Level off surfaces upon which embankments are to be constructed. Where existing ground is left undisturbed, plow or disk the Surface and mix it in with the first layer of embankment material to provide a satisfactory bond.
- B. Ground surfaces sloped steeper than 1 vertical to 4 horizontal shall be plowed, stepped or broken up to permit bonding of the embankment with the existing surface.
- C. Uniformly place and spread fill in successive horizontal layers not more than 1 foot in compacted depth.
- D. Compact each layer of fill to a minimum density of 90%.

3.07 PREPERATION OF PAVEMENT SUBBASES

- A. Shape the entire subbase to the required line, grade and cross section. Remove and dispose of all soft and unsuitable material and replace with an approved material. Remove and dispose of all boulders and ledge rock. Break off to a depth of not less than 6 inch below the subbase. Fill resulting depressions with an approved material.
- B. Roll subbase to achieve the required compaction densities specified in Section 02250. Reshape, wet and aerate subbase, as required. Compact the entire width of the area to receive pavement, plus the areas within 5 feet of and parallel and adjacent to the edges of the pavement. Compact the full depth of embankments to the required density. Where cuts are encountered, thoroughly roll and compact until no further consolidation is apparent.
- C. When pavements cannot be placed immediately after the preparation of the subbase, the entire subbase shall be reshaped and compacted to the required line, grade and cross section.
- D. After rolling, the surface of the subbase shall not show any deviation in excess of 3/4 inch when tested with a 10 foot straightedge applied both parallel to and at right angles to the centerline of the area. The elevation of the finished subbase shall not vary more than 0.50 feet from the established grade and cross section.
- E. Do not disturb the finished subbase by traffic or other operations and protect and maintain in a satisfactory condition until the overlaying pavement is placed.

3.08 SUBBASE AND EMBANKMENT PROTECTION

- A. Keep the embankments and excavations shaped and well drained. Where ruts or erosion occur, add additional fill and reshape and re-compact before placing paving materials.
- B. The storage or stockpiling of material on prepared subbases is not permitted.
- C. All subbases will be inspected by Engineer and paving materials shall not be placed prior to receipt of Engineer's approval. The placing of pavement materials on a muddy, spongy, weaving or frozen subbase is not permitted.

3.09 DITCHES - SWALES

- A. Accurately cut ditches and swales to the required cross sections and grades. Cut off all roots, stumps, rock and foreign matter, in the sides and bottoms of ditches and swales, to conform to the required slope, grade and shape.
- B. Maintain ditches and swales at all times so that they effectively drain. Refill, reshape and re-compact where ruts or erosion occurs.

3.10 DUMPED RIPRAP

- A. Place riprap in a manner so as to produce a reasonably well graded mass of rock with the minimum practicable percentage of voids. The finished stone surface shall be free from objectionable pockets of smaller stones and clusters of larger stones.
- B. Placing stones in layers or dumping by methods likely to cause segregation of the various sizes is not permitted. Obtain the desired distribution of the various sized stones by selective loading, controlled dumping of successive loads or by other approved means.
- C. Completely fill voids with fine stone or gravel. Rearrange stones by mechanical equipment or by hand to the extent necessary to obtain a reasonably well graded distribution.
- D. The final stone surface shall not exceed 3 inches, plus or minus, from the required grades and elevations. Leave riprap in a first stable mass.

3.11 STONE SLOPE PROTECTION

- A. Place stone to the depth, grade, line and cross section shown on the Drawings. The finished stone surface shall

be free from objectionable pockets smaller stones and clusters of larger ones.

- B. Carefully dump and grade stone to the extent necessary to obtain a reasonably smooth, stable and well graded distribution with the minimum practicable percentage of voids.

3.12 FIELD QUALITY CONTROL

- A. Soils testing shall be performed by the approved independent testing laboratory in accordance with Section 02250 - Soil Compaction
- B. Engineer will establish the date, time, location, number, and types of soils tests required.

END OF SECTION

SECTION 02315 - EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Excavating for the installation of underground lines, structures and foundations.

1.02 RELATED REQUIREMENTS

- A. Section 01700 - Execution Requirements: General requirements for dewatering of excavations and water control.
- B. Section 02230 - Clearing and Grubbing
- C. Section 02250 - Soil Compaction
- D. Section 02310 - Site Grading: Soil removal from surface of site.
- E. Section 02316 - Fill and Backfill: Fill materials, filling, and compacting.
- F. Section 02317 - Trenching for Site Utilities: Excavating for utility trenches outside the building.
- G. Section 02318 - Rock Removal: Removal of rock during excavating.
- H. Section 02501 - Dewatering
- I. Section 02901 - Restoration of Surfaces
- J. Notes as stated on Plans by DuBois & King, Inc.

1.03 DEFINITIONS

- A. Solid Rock, Loose Rock, Common Excavation and Rock Excavation - Defined in Section 02318.
- B. Common Excavations - Removal and disposition of all materials, except solid rock, which are encountered within the required widths and depths of excavation.

1.04 SUBMITTALS

- A. Section 01300 - Administrative Requirements

1.05 QUALITY ASSURANCE

- A. Unless otherwise specified, or approved by Engineer in writing, tunneling is not permitted.

- B. Do not restrict access to any private road or driveway for more than one hour. Provide and maintain suitable temporary crossing over open ditches where required to meet this condition.
- C. When excavating in or adjacent to the travelled portion of highways, take whatever measures are necessary to protect the road surfaces from becoming undermined.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Store topsoil separately from all other excavated materials on the site and preserve for reuse.
- B. Store excavated materials meeting the requirements for backfill in an orderly manner at a sufficient distance away from banks of excavations and trenches to avoid overloading and to prevent slides or cave-ins. Do not store materials on, over or adjacent to structures or utilities which may collapse or become damaged due to promptly and dispose of away from the site.
- C. Promptly remove materials not specified to be stored or reused.
- D. Obstruction of roads, driveways, sidewalks or interferences with drainage along gutters, ditches or drainage channels with stored material is not permitted. If materials cannot be stored at the site to avoid such obstructions and interferences, they shall be stored away from the site and brought back when and as needed.
- E. No construction activity, access, storage or other use shall take place beyond the construction easement boundaries. Engineer may require Contractor to install and maintain snow fences along the boundaries, where such boundaries could be violated.

1.07 PROJECT CONDITIONS

- A. Verify that survey bench mark and intended elevations for the Work are as indicated.
- B. Protect plants, lawns, and other features to remain.
- C. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, curbs, and utilities from excavating equipment and vehicular traffic.
- D. Maintain excavations free of groundwater, sewage, stormwater, ice and snow during the progress of the Work and until the finished work is safe from injury.

- E. Protect subgrades against freezing by means of insulated blankets, salt hay or other methods.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Wood Sheeting and Bracing - Sound timber, free from defects which might impair its strength and effectiveness.
- B. Steel Sheeting and Bracing - ASTM A328.

PART 3 EXECUTION

3.01 EXCAVATING

- A. Excavate for structures to the elevations indicated on the Drawings and extend a sufficient distance from foundation walls, piers and footings to provide adequate clearances for construction operations, including sheeting and bracing, if required, and for inspection purposes.
- B. Trim approximately the last four inches of foundation subgrades, in earth, by hand just prior to the placement of concrete or concrete reinforcement.

3.02 SHEETING AND BRACING

- A. Provide and maintain adequate sheeting and bracing as required for the safety and protection of the Work, persons and adjacent property and structures in accordance with Federal, State, and Local laws, codes, ordinances, and standards.
- B. Engineer may, at his discretion, order sheeting and bracing to be cut-off and left-in-place. Where, in the opinion of Contractor, damage may result from withdrawing sheeting, he shall immediately notify Engineer for verification. Sheeting ordered left-in-place adjacent to piping shall be cut off not less than 12" over the top sheeting and bracing.
- C. Contractor is fully responsible for the design and construction of all sheeting and bracing used and for all damages resulting from improper quality, strength, placing, maintenance or removal of sheeting and bracing.

3.03 UNSTABLE MATERIALS

- A. Remove unstable materials in excavations and trench bottoms, which are incapable of supporting pipes or structures, to the extent and depths directed by Engineer, and properly dispose of off-site. Refill and compact the

excavation or trench as required, with Granular Fill, Stone Fill or concrete, as directed by Engineer.

- B. Whenever the material encountered is, in Contractor's opinion, incapable of providing adequate support, he shall immediately notify the Engineer for verification. Make measurements, for payment purposes, in Engineer's presence.

3.04 DISPOSAL OF EXCAVATED MATERIALS

- A. Excavated materials which meet the requirements for embankment fill or backfill may be used for constructing embankments and backfilling, as applicable. Remove excess excavated materials and dispose off-site.
- B. Load and remove unsuitable materials and dispose off-site. The storing or stockpiling of unsuitable material is not permitted and such material shall be loaded directly from the excavation onto trucks.

3.05 PROTECTION

- A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.
- B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 02316 - FILL AND BACKFILL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Filling, backfilling, and compacting for paving, site structures, and utilities.
- B. Backfilling and compacting for utilities outside the building to utility main connections.
- C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

- A. Section 02310 - Site Grading
- B. Section 02315 - Excavation: Removal and handling of soil to be re-used.
- C. Section 02317 - Trenching for Site Utilities: Excavating for utility trenches outside the building.
- D. Section 02901 - Restoration of Surfaces
- E. Notes as stated on Plans by DuBois & King, Inc.

1.03 DEFINITIONS:

- A. Earth - Clay, loam, sand, gravel, topsoil and other materials not classified as solid rock or loose rock.
- B. Common Earth - Clay, loam, sand, gravel, topsoil and similar materials which may contain some stones, pebbles, lumps and rock fragments up to 6" in largest dimension, but does not contain debris and frozen material.
- C. Select Earth - Sand, gravel and similar materials which may contain small amounts of stones, pebbles or lumps over 1" in largest dimension, but none over 2" in largest dimension, but does not contain clay, loam, organic material, debris and frozen material.
- D. Clean Washed Crushed Stone - Approved, imported aggregate, ASTM C33, Size 67 (3/4" - No. 4). Shall be washed to remove fines and shall not be limestone or marble.

Gradation:	Passing 2" Sieve	=	100%
	Passing 1½" Sieve	=	90-100%
	Passing 3/4" Sieve	=	0-30%
	Passing #4 Sieve	=	0-5%

- E. Common Fill - Consists of Select Earth, imported sand or other granular materials as approved by Engineer.

- F. Sand Bedding - Sand conforming to ASTM C33, Fine aggregate.
 Gradation: Passing #4 Sieve = 100%
 Passing #200 Sieve = 0-20%
- G. Earth Overburden - Earth overlying solid rock and in place during blasting operations or earth not classified as Select or Common Earth.
- H. Unstable Material - Debris, frozen materials, topsoil, quicksand and all wet, soft or loose material which does not provide sufficient bearing capacity to satisfactorily support pipes or other work.
- I. Unsuitable Material - Excavated material which does not meet requirements for backfilling purposes and includes solid and loose rock, earth overburden and unstable material.
- J. Topsoil - Surface layer of soil and sod suitable for use in seeding and planting and not containing debris, subsoil, stumps, roots, brush, stones, clay lumps and similar objects greater than 2" in largest dimension and material toxic to plant growth.
- K. Paved Areas - The area which lies directly under a paved surface, whether it be asphalt, concrete, or other paving materials.
- L. Bank Run Gravel - Satisfactorily graded, free draining, hard, durable stone and coarse sand reasonably free from silt, loam, clay and organic matter.
 Gradation: Passing 2" Sieve = 95-100%
 Passing 4" Sieve = 40-70%
 Passing #100 Sieve = 5-20%
 Passing #200 Sieve = 4-8%
 (Maximum size of 6")
- M. Screened Gravel - Uniformly graded, clean, hard, and durable particles free from an excess of soft, thin, elongated, laminated, or disintegrated pieces and be free from silt, loam, clay or organic matter.
 Gradation: Passing 1½" Sieve = 100%
 Passing ¾" Sieve = 90-100%
 Passing ⅜" Sieve = 0-30%
 Passing #4 Sieve = 0-5%
- N. Crushed Gravel/Granular Fill - Uniformly graded and free of silt, loam, clay or organic matter.
 Gradation: Passing 2" Sieve = 100%

Passing #4 Sieve = 40-70%
Passing #100 Sieve = 5-20%
Passing #200 Sieve = 4-8%

(Max. 5% passing #200 sieve for material designated as "frost free")

1.04 REFERENCE STANDARDS

- A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2005.
- C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2000a.
- D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.
- E. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2002.
- F. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994(R 2001).
- G. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2000.
- H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2004.
- I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2004.
- J. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2000.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Certified copies of all results of moisture-density tests and field compaction density tests.

- C. Gradations of Stone Bedding, Stone Fill, Sand Bedding, Bank Run Gravel, Screened Gravel, and Crushed Gravel/Granular Fill.
- D. Gradations of other material proposed for use in the work.
- E. Copies of measurements and computed volumes of unstable material removed.
- F. Certification from testing laboratory that crushed gravel under-drain material meets permeability requirements at required compaction.
- G. Compaction Density Test Reports.

1.06 QUALITY ASSURANCE

- A. Moisten or dry backfill to the proper moisture content as determined in accordance with ASTM D1557, Method C.
- B. All subgrades shall be approved by Engineer before pipes or structures are installed or concrete is placed.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Store topsoil separately from all other excavated materials on the site and preserve for reuse.
- B. Promptly remove materials not specified to be stored or reused.
- C. Obstruction of roads, driveways, sidewalks or interferences with drainage along gutters, ditches or drainage channels with stored material is not permitted. If materials cannot be stored at the site to avoid such obstructions and interferences, they shall be stored away from the site and brought back when and as needed.
- D. No construction activity, access, storage or other use shall take place beyond the construction easement boundaries. Engineer may require Contractor to install and maintain snow fences along the boundaries, where such boundaries could be violated.

1.08 PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. When fill materials need to be stored on site, locate stockpiles where indicated.
 - 1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
 - 2. Prevent contamination.

3. Protect stockpiles from erosion and deterioration of materials.
- C. Verify that survey bench marks and intended elevations for the Work are as indicated.
- D. Backfilling with frozen materials or when materials already in place are frozen is not permitted.

1.09 SCHEDULING AND SEQUENCING

- A. Do not backfill until the following conditions are met:
 1. Concrete - See Division 3 for the time required after the placement of concrete.
 2. Manholes - See Section 02601 which requires that specific manholes be given and pass leakage tests prior to backfilling.
 3. Mortar Plaster and Masonry - Mortar has set, but no sooner than three days after the mortar was applied.
 4. Dampproofed, Waterproofed, and Coated Surfaces - Only after materials have properly cured.
 5. Work in General - Engineer and testing laboratory have completed all inspections and tests.
- B. Except as noted above, or required by other Sections, or when approved or directed by Engineer, backfill pipe and cable excavations within one day after installation. Backfill other excavations as soon as possible after all inspections and tests have been completed.

PART 2 PRODUCTS

2.01 FILL MATERIALS

- A. Backfill - General - To the extent suitable materials are available, backfill shall consist of excavated material. Where excavation does not provide sufficient approved material, import additional materials from off site.
- B. Backfill - Trenches - Select fill from pipe bedding material up to a minimum of 12 inches over the top of pipe or top of sand encasement; Common Earth, Elect Earth, or Select Fill for the remainder of the trench. Backfill materials shown on the Drawings take precedence over this paragraph. Select Fill, or better material for the full depth for all paved areas.
- C. Backfill - Around Structures - In paved areas, Select Fill, or a better materials for the full depth. In unpaved areas, Select Fill for the full depth. Backfill materials shown on the Drawings take precedence over this paragraph.

2.02 SOURCE QUALITY CONTROL

- A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.
- B. See Section 02310 for additional requirements.
- C. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.
- D. Verify structural ability of unsupported walls to support imposed loads by the fill.
- E. Verify underground tanks are anchored to their own foundations to avoid flotation after backfilling.

3.02 PREPARATION FOR BACKFILLING

- A. Immediately prior to backfilling, remove all rubbish, debris, forms and similar materials from the excavation.
- B. Do not backfill until the conditions of Paragraph 1.09 are met.

3.03 BACKFILLING TRENCHES

- A. 12 inches Over Pipes - Provide 12 inches of Select Fill over the top of the pipe as detailed on the Drawings. Place fill by hand in not greater than 6 inch layers. Bring Select Fill up evenly on both sides of pipes and carefully and thoroughly compact under the pipe haunches. Do not displace pipe.
- B. 12" Over Sand Encasement - Provide 12" of Select Fill over the top of the sand. Place fill by hand in not greater than 6" compacted layers.
- C. Remainder of Trench - Paved Areas - Select Fill, Select Earth, or Common Earth, placed in not greater than 12" compacted layers.

- D. Remainder of Trench - Other Areas - Select Earth, or Common Earth, placed in not greater than 15" compacted layers.

3.04 BACKFILLING AROUND STRUCTURES

- A. Uniformly spread and deposit backfill in horizontal layers, not over 8" in compacted thickness. Take special precautions to prevent wedging actions against the walls.
- B. In paved areas, backfill with Select Fill, or better material where required by the Highway Department, for the full depth. In unpaved areas, backfill with Select Fill, Select Earth, or Common Earth.

3.05 GRANULAR FILL UNDER SLABS & FOOTINGS

- A. Prior to placing granular fill, all organic material, topsoil, debris and any other deleterious material shall be removed.
- B. Place material in maximum 8" lifts and compacted to 95% of maximum density at optimum moisture content as determined by ASTM D1557, Modified Proctor.
- C. If the materials density tests less than 95%, corrective action and additional testing will be required. The additional testing and corrective action will be paid for by the Contractor.
- D. Place materials in such a way as not to damage concrete foundations and footings.

3.06 TOP OF BACKFILL

- A. Paved Areas - Carry backfill up to pavement subgrade, ready to receive pavement. If paving is to be done at a later date, carry backfill up so as to provide slightly mounded surface with edges flush with the existing pavement surface.
- B. Unpaved Areas - Carry backfill up to adjacent finished grade, minus the depth of any required topsoil or topsoil and sod finish, and so as to provide a finished surface slightly mounded over the trench.
- C. Cover over Pipe - Immediately notify Engineer when the depth of cover over any pipe is less than 5'.

3.07 COMPACTION REQUIREMENTS

- A. See Section 02250.

3.08 FIELD QUALITY CONTROL

- A. Soils testing shall be performed by the approved independent testing laboratory in accordance with Section 02250 - Soil Compaction.
- B. Engineer will establish the date, time, location, number, and types of soils tests required.

3.09 ADJUST AND CLEAN

- A. Any trenches or excavations which have been backfilled and show any evidence of settlement or being improperly backfilled, or have been tested and failed, shall be re-excavated to the depth required for proper compaction and then properly refilled and compacted.
- B. Replace or repair any pipe or structure which has been damaged or displaced.

END OF SECTION

SECTION 02317 - TRENCHING FOR SITE UTILITIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Trenching for the installation of underground piping, structures and foundations.

1.02 RELATED REQUIREMENTS

- A. Section 02310 - Site Grading
- B. Section 02315 - Excavation
- C. Section 02316 - Fill and Backfill
- D. Section 02318 - Rock Removal: Removal of rock during excavating.

1.03 REFERENCES

- A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001.
- B. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2005.
- C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2000a.
- D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.
- E. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³)); 2002.
- F. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994(R 2001).
- G. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2000.
- H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2004.
- I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2004.

- J. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2000.

1.04 DEFINITIONS

- A. Finish Grade Elevations: Indicated on drawings.
- B. Subgrade Elevations: Indicated on drawings.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Certified copies of all results of moisture-density tests and field compaction density tests.
- C. Gradations of Stone Bedding, Stone Fill, Sand Bedding, Bank Run Gravel, Screened Gravel, and Crushed Gravel/Granular Fill.
- D. Gradations of other material proposed for use in the work.
- E. Copies of measurements and computed volumes of unstable material removed.
- F. Certification from testing laboratory that crushed gravel under-drain material meets permeability requirements at required compaction.

1.06 QUALITY ASSURANCE

- A. Unless otherwise specified, or approved by Engineer in writing, tunneling is not permitted.
- B. If trenching widths are exceeded, redesign with stronger pipe, concrete cradles or other special installation procedures may be required and shall be provided where directed by the Engineer. All additional costs, including the cost of redesigns, shall be borne by Contractor.
- C. Do not restrict access to any private road or driveway for more than one hour. Provide and maintain suitable temporary crossing over open ditches where required to meet this condition.

1.07 PROJECT CONDITIONS

- A. Provide sufficient quantities of fill to meet project schedule and requirements. When necessary, store materials on site in advance of need.
- B. Verify that survey bench marks and intended elevations for the Work are as indicated.

- C. Protect plants, lawns, and other features to remain.
- D. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, curbs, and utilities from excavating equipment and vehicular traffic.
- E. Maintain trenches free of groundwater, sewage, stormwater, ice and snow during the progress of the Work and until the finished Work is safe from injury.
- F. Protect subgrades against freezing by means of insulated blankets, salt hay or other methods.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Concrete for Cradles and Encasements - Class C concrete as specified in Division 3.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.02 TRENCHING

- A. Excavate to the widths and depths shown on the Drawings, specified or directed by Engineer. Trenches of narrower widths are permitted provided that the smaller widths do not adversely affect the proper installation of the Work.
- B. Where it is necessary for pipes to be laid in fill, place Select Fill in uniform horizontal layers not over 6" in compacted thickness. Compact each layer in accordance with Section 02250. Carry fill up to an elevation at least two feet above the elevation of the top of the pipe to be laid and then excavate the trench.
- C. Limit each day's trench excavation to the length of pipe that will be installed that day, and then to no more than 100' ahead of the pipe laying.

3.03 TRENCH BOTTOMS

- A. General - The bedding required for each type of pipe is specified and are detailed on the Drawings.
- B. Class A - Concrete and Concrete Encasement - Excavate trench to the required subgrade elevation to receive concrete. Rest pipe on concrete brick or sacks of lean concrete, keeping supports to a minimum but sufficient to

support the pipe and to retain the pipe at the required line and grade. Install forms and reinforcing where required. Exercise extreme care in placing concrete so as not to move the pipe. Work concrete under and around the pipe. Other supports may be acceptable.

- C. Class B - First Class Bedding - Excavate trench to the required subgrade elevation. Place Select Fill bedding in layers not exceeding 6" in compacted thickness. Compact bedding and shape to the configuration of the pipe and then hand dig depressions just large enough to accommodate pipe joints. When using Stone Bedding, place stone to the elevation of the bottom of the pipe and firmly tamp. Add additional stone so as to form a shaped bed for the pipe barrel to rest on. After the pipe has been set, add the additional stone along the sides of the pipe, as shown on the Drawings, and firmly tamp into place.
- D. Class B - Rock - All pipes shall be bedded in this manner when rock is encountered in the trenches. Place bedding material as described in "Class B - First Class Bedding" above.
- E. Class C - Ordinary - Excavate the bottom of the trench by hand and form a shaped bed which will firmly support the lower quadrant of the pipe. Hand excavate depressions just large enough to accommodate pipe joints. The pipe shall rest on undisturbed soil. If the trench is over excavated, provide a bedding as directed by Engineer.
- F. Sand Bedding or Encasement - Excavate trench to the required subgrade elevation. For pipes, install bedding as required for "Class B - First Class Bedding." For cables and remainder of sand encasements, place sand in layers not exceeding 6" in compacted thickness.

END OF SECTION

SECTION 02318 - ROCK REMOVAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal and disposal of boulders and rock from the construction site, excavation and trenches.

1.02 RELATED SECTIONS

- A. Section 02315 - Excavation
- B. Section 02316 - Fill and Backfill: Fill materials.
- C. Section 02317 - Trenching for Site Utilities
- D. Section 02901 - Restoration of Surfaces

1.03 REFERENCES

- A. NFPA 495 - Explosive Materials Code; National Fire Protection Association; 2001.

1.04 DEFINITIONS

- A. Solid Rock - Naturally deposited rock material which cannot be removed by a modern, power driven, one cubic yard backhoe excavator in good condition without continuous drilling and blasting and includes boulders and reinforced concrete pavement exceeding one cubic yard in volume.
- B. Loose Rock - Shale, slate, soft sandstone, nested boulders and other rock material which is decomposed, stratified or shattered to such an extent that it can be removed by a modern, power driven, one cubic yard backhoe excavator in good condition without the need for drilling or blasting.
- C. Rock Excavation - Removal and disposition of solid rock, only, which is encountered within the specified payment limits of excavations.
- D. Trench Rock Excavation - Rock Excavation where Solid Rock is removed from trenches (for pipe-lines, cables, conduits, manholes and other related, confined work) where the bottom width of the installed item does not exceed 8 inches.
- E. Site Rock Excavation - All Rock Excavation other than Trench Rock Excavation

1.05 SUBMITTALS

- A. Section 01300 - Administrative Requirements, for submittal procedures.

- B. Copies of all permits required.
- C. Copies of additional hazard insurance policy covered required.
- D. Names of blasters, qualifications, experience records, certificates of insurance and copies of licenses.
- E. At least two weeks prior to commencing drilling and blasting operations, CONTRACTOR shall submit to ENGINEER for approval complete details of his proposed blasting operations, including the following for each separate blasting area (i.e., building, rock cut, trench, etc.).
 - 1. Sequence and schedule of blasting rounds, including the general method of developing the excavation, lift heights, etc.
 - 2. Specifies of a typical production round (away from the perimeter of excavation) and specifies of all controlled blasting at the perimeter of the excavation, including:
 - a. Diameter, spacing, burden, depth, and orientation of each drill hole.
 - b. Type and nomenclature of detonators, and delay pattern.
 - c. Type, nomenclature, and weight per cartridge of explosive to be used, and weight distribution of charge to be used within each hole, as well as total weight of explosive charge on each delay, and the total weight for the blast round.
 - d. Type and distribution of stemming to be used in each hole.
 - e. Estimates of vibration levels at nearest adjacent structures.
 - 3. Methods of matting or covering of blast area, if required to prevent flyrock and excessive airblast pressure.
 - 4. Written evidence of the licensing, experience, and qualifications of blasters who will be directly responsible for the loading and firing of each shot.
 - 5. Name and qualifications of the person responsible for designing and directing the blasting.
 - 6. A listing of instrumentation which Contractor proposes to use to monitor vibrations and airblast overpressure levels, together with performance specifications and user's manual supplied by the manufacturers, and a recent calibration (within the previous six months) to a standard traceable to the National Bureau of Standards).

7. A copy of the blasting permit obtained to conduct blasting on the Site.
 8. Before-blasting conditions survey report.
- F. Prior to construction, the Contractor shall at his own expense have prepared by an independent agency approved by the Engineer, a survey of all existing structures and utilities (including wells and railroads) on the site and within 500 feet of the site. Said survey shall address the structural integrity of all existing structures and utilities, and the flow capability of any wells. Upon the completion of blasting operations, the Contractor shall have prepared by the same independent agency a survey addressing the structural integrity of the same structures and utilities and the flow capability of any wells.
- G. In addition, a blast monitoring program shall be established with seismographs installed at selected monitoring stations inside adjacent structures. Selected monitoring stations shall be, as a minimum, the nearest structure for all blasts, and other sensitive structures as recommended by Contractor's independent agency, Owner or Engineer. During construction, detailed records should be kept of:
1. Charge weight;
 2. Location of blast point and distance from existing structures;
 3. Delays;
 4. Response indicated by air blast monitors and seismographs including peak particle velocity, vibration frequency, and air blast, for safety.
- H. Small charges should be used initially to establish Site specific relationship between charge weight, distance and response.
- I. In the event that Contractor's blasting round results in ground vibrations or airblast overpressure which exceed the blasting limit criteria specified herein, Contractor shall, prior to detonating any subsequent rounds, revise his round design appropriately to reduce the vibrations and submit the revised round design to Engineer for approval.
- J. Whenever explosives are used, they shall be of such character and in such amount as permitted by the State of Maine, local laws and ordinances, and all respective agencies having jurisdiction over them. Contractor shall survey the entire blast area for a minimum of five minutes following a blast to guard against rock falls before

commencing work in a cut.

- K. Review by Engineer of the blast design and techniques shall not relieve Contractor of responsibility for the accuracy, adequacy, and safety of the blasting, exercising proper supervision and field judgement, and producing the results within the blasting limits required by these Specifications.
- L. The specific requirements of this section are not intended and should not interfere with the ability of Contractor to alter spacing of holes and explosive loading so that adequate rock breakage may be obtained.
- M. Within 24 hours following each blast, Contractor shall submit to Engineer a Blasting Monitoring Report, which shall include the following items:
 - 1. Details of the round as shot, including drill hole diameter, spacing, burden, depths, delay pattern used, with charge weights for each delay, and loading configuration of typical holes.
 - 2. Blasting Monitoring Data:
 - a. A plan drawing, to scale, showing the location of each blast monitoring instrument, as well as the location of each round.
 - b. Results of blast monitoring at each instruments location, including peak particle velocity in inches per second (in/sec), vibration frequency in Hertz (Hz) and peak airblast overpressure in pounds per square inch (psi), as well as a copy of the strip chart recording for each monitoring location, marked with the date, time, and location of equipment.

1.06 QUALITY ASSURANCE

- A. Provide all blasting operations using experienced blasters and comply with all applicable Federal, State and Local laws, ordinances, codes and regulations including OSHA (1926), VOSHA and NFPA code 495. Blasting shall be done only by qualified, reputable persons regularly engaged in this type of work. Conform to all VOSHA requirements, including, but not limited to, notification of overhead utility Owners, and posting of Danger signs and a code of blasting signals, and use of flagmen to control adjacent traffic.
- B. Investigate, evaluate and assess the quantity of rock to be removed and the difficulties and hazards associated with its removal.

- C. Charges shall be of such power, spacing and timing that the blasts will not make excavations unduly large, shatter adjoining rock, nor damage or endanger life, property, work completed or in progress, adjacent utilities and other structures. Cover each blast with heavy timbers or steel mats. The Contractor shall be fully liable for all damage or nuisance caused by the blasting operations and shall promptly repair all damages and settle all claims at his expense.
- D. Owner and Engineer reserve the right to require removal of rock by line drilling and wedging if blasting operations are performed in violation of Specification requirements.
- E. Method of measurement to be agreed upon prior to blasting.
- F. Explosives Firm: Company specializing in explosives for disintegration of rock, with five years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for explosive disintegration of rock and to NFPA 495 for handling explosive materials.
- B. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.

1.08 PROJECT CONDITIONS

- A. Contractor shall, at his own expense, have prepared by an independent agency approved by the Engineer, a survey and documentation of the conditions of buildings and utilities within 500 feet of rock removal, prior to blasting, and photograph existing conditions identifying existing irregularities.
- B. The survey shall address the structural integrity of all existing structures and buildings.
- C. At the completion of blasting operations, the Contractor shall have prepared by the same independent agency a second survey addressing the structural integrity of the same structures and utilities.
- D. Coordinate work within residential areas with owners of buildings and/or utilities.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Handle and store explosives in strict accordance with applicable Federal, State and Local laws, ordinances, codes and regulations, and with NFPA 495, except that where

more stringent requirements are contained elsewhere herein, such requirements shall govern.

- B. Keep explosives on site only in such quantity as may be needed for the work under way and only during such time as they are to be used.
- C. Store explosives in a secure manner separate from all tools, with caps or detonators safely stored at a separate point more than 100 feet distant.
- D. Remove remaining explosives from the job site when their need is no longer required.
- E. Store excavated rock as specified in Section X.
- F. Disposal of rock shall be by one of the following:
 - 1. If rock is suitable in nature and of the proper size, it may be used as rip-rap where rip-rap is required in the Work.
 - 2. If the Contract Documents permit or require the use of rock in embankments, fills or other areas, it may be incorporated into the Work accordingly.
 - 3. If the Contract Documents designate a spoil or stockpile area, deliver and neatly place the rock in the designated area.
 - 4. Delivered to an area designated by Owner or Engineer.
 - 5. If none of the above apply, remove the rock from the Project site and dispose of off-site at an approved location.

1.10 SCHEDULING

- A. Notify Engineer and homeowners in the immediate vicinity at least 48 hours prior to blasting operations.

1.11 INDEMNITY

- A. Notwithstanding full compliance with these specifications, approval of blasting plan, and successful limitation to maximum peak particle velocity and airblast overpressure as specified herein, Contractor shall be solely responsible for any damage, direct or indirect, arising from blasting and shall hold Engineer harmless from any costs, liens, charges, claims, or suits, including the cost of defense arising from such damage, reasonably determined to be caused by Contractor's activities. Engineer shall be additionally named

insureds on any insurance policy covering blasting carried by Contractor, and this requirement shall also be enforced on any subcontractor retained by Contractor.

1.12 PROTECTION OF COMPLETED WORK

- A. Contractor shall conduct the blasting operations in such a manner that completed work of any type is not damaged. Any replacement or repair of damaged work as directed by Engineer shall be made at no additional cost to Owner and Engineer. No blasting shall be done within 200 feet of concrete, shotcrete, or grout which has been in place less than seven (7) days, not within 50 feet of any concrete, shotcrete, or grout that is older than seven (7) day, unless authorized by Engineer.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Explosives: Type recommended by explosive firm following seismic survey and required by authorities having jurisdiction.
- B. Delay Device: Type recommended by explosives firm.
- C. Blast Mat Materials: Type recommended by explosives firm.
- D. Concrete: Concrete used to fill excavations that have been over-excavated shall be Class C (28-day compressive strength of 2,000 psi) as specified in Division 3.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that all limiting boundaries of temporary and permanent easements and property lines are clearly marked in the field and that blasting operations will not violate these boundaries.
- B. Ascertain and verify the locations and character of structures, underground lines and subsurface conditions and verify that blasting operations will not adversely affect them.
- C. Do not begin operations until conditions are satisfactory.

3.02 PREPARATION

- A. If over burden is to be removed prior to blasting, clean surfaces of rock to be removed and take cross sections in the presence of Engineer.

3.03 PERFORMANCE

- A. Remove rock to the limits shown on the Drawings, specified or directed by Engineer.
- B. Cut subgrades in rock, where concrete is to be placed, to a firm level surface and clear off all loose material. Make rock surfaces sufficiently rough to ensure adequate bonding of concrete.
- C. Rock excavated below indicated foundation subgrades, not authorized by Engineer, shall be replaced to the indicated subgrade by backfilling with Class C concrete, or other materials which may be approved by Engineer.
- D. Excavations which are made wider than shown on the Drawings, specified or authorized by Engineer, may necessitate redesigns and stronger materials for which all costs shall be borne by Contractor.
- E. Vibration Limits - Contractor shall conduct all blasting operations in such a manner that peak airblast overpressure and peak particle velocity of ground vibrations do not exceed the following limits at the location of any existing dwelling or other building in the vicinity of the project.

Distance(D) from Blast Round to Building (ft)	Maximum Allowable Peak Particle Velocity (PPV) of Ground Vibration (in/sec) (1)	Maximum Allowable Airblast Overpressure (psi)
Less than 300	1.00	0.014
Greater than 300 or at Site Limits	0.75	0.014

NOTES:

1. Maximum PPV shall be the maximum of three components measured in three mutually perpendicular directions (transverse, vertical and longitudinal)
2. Contractor shall monitor vibrations at the nearest structure for all blasts and other sensitive structures as designated by Section 1.03.

3.04 FIELD QUALITY CONTROL

- A. Independent agency field inspection will be provided under provisions of Section 01400 - Quality Requirements as noted above.

END OF SECTION

SECTION 02501 - DEWATERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Maintenance of trenches and excavations free of water, snow, ice and other liquids.

1.02 RELATED SECTIONS

- A. Section 02270 - Erosion Control
- B. Section 02315 - Excavation
- C. Section 02316 - Fill and Backfill
- D. Section 02317 - Trenching for Site Utilities

1.03 DEFINITIONS

- A. Liquids, as used in this Section, means sewage, water, stormwater, groundwater, or other liquid or fluid material.

1.04 QUALITY ASSURANCE

- A. Conduct operations in a manner which will keep the Work free of standing and flowing liquids, snow, and ice, and dispose of these materials in an approved manner so as not to damage or create a nuisance to the Work, the public, surface and ground waters, and adjacent proper ties.
- B. The accumulation of liquids, ice and snow in excavations, trenches, areas to be graded and adjacent areas during construction is not permitted.
- C. Unless otherwise noted or approved by Engineer, the placement of Work in a liquid is not permitted.
- D. The use of installed pipes, or pipes under construction, to drain excavations, trenches and adjacent areas is prohibited, except in the case of drainage pipes where it is necessary to maintain flow from water courses.
- E. Obtain all discharge and water quality permits from the State of Maine applicable agencies - Fines resulting from noncompliance with the statutes, regulations and permit conditions set by the State of Maine will be the sole responsibility of the Contractor.

PART 2 PRODUCTS

2.01 MATERIALS

Provide all equipment and materials necessary to perform dewatering operations in a safe and satisfactory manner.

PART 3 EXECUTION

3.01 Performance

- A. Perform all ditching, diking, pumping, well pointing and bailing, and construct all drains and channels necessary to keep all work areas clear of liquids, ice and snow during the progress of the Work and until the finished work is safe from injury.
- B. Do not permit any liquid to rise over any work in place until such work is adequately protected.
- C. Locate noise producing dewatering equipment as far from residences, businesses, and the public in general, so as to minimize noise pollution. When required, or directed by Engineer, provide acoustical enclosures or barriers to reduce noise to an acceptable level.

3.02 DISPOSAL

- A. Dispose of all liquid, ice and snow in a manner which will not create a hazard to public health, nor cause injury to public or private property, lives, work installed or in progress, or public streets, nor cause any interference in the use of streets and roads by the public, nor cause erosion.
- B. Do not permit liquids containing sewage, sludge, gas, oil, sediments and other deleterious, poisonous, toxic or oxygen demanding substances to enter streams, lakes, other surface waters or into the groundwater.
- C. Secure written permission from the appropriate agency before utilizing a storm drain for the disposal of liquids. Do not overload sewers. Terminate the use of storm drains during any storm where the combined runoff and dewater will result in flooding.
- D. Dispose of all liquids directly into settling ponds or other treatment devices when indicated on the drawings or directed by the Engineer.

3.03 PROTECTION

- A. Provide adequate protection from the effect of possible uplift due to storm or groundwater where buoyancy might lift installed work or cause joint or structure failure during construction.
- B. Protect the interior of installed work from the entering and accumulation of liquids, ice and snow. Immediately remove and dispose any accumulation which may occur.

3.04 ADJUST AND CLEAN

Adjust, repair, replace or clean all work, surfaces and property which may have been damaged as a result of any dewatering operation.

END OF SECTION

SECTION 02601 - PRECAST CONCRETE STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Work covered by this Section includes the furnishing and installation of precast concrete manholes, septic tankage, valve pits, utility vaults and pump station structures at locations shown on the Drawings.

1.02 RELATED SECTIONS

- A. Pipe and Manhole Leakage Testing 01666
- B. Excavation 02315
- C. Fill and Backfill 02316
- D. Trenching for Site Utilities 02317
- E. Restoration of Surfaces 02901
- F. Concrete, Formwork and Reinforcing Div. 3

1.03 QUALITY ASSURANCE

- A. All precast concrete manhole sections and all castings shall each be the product of a single manufacturer who can furnish evidence of satisfactory experience in the production of high quality products of the type indicated and specified.
- B. Precast concrete manhole sections and all castings shall be manufactured in a facility currently certified by the National Precast Concrete Association (NPCA) and produced in accordance with the NPCA Quality Control Manual.
- C. Provide at least one skilled mason who shall be present at all times during the installation of inverts and benches and who shall personally direct the masonry work performed under this Section.
- D. Use only skilled masons, who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the construction of inverts, benches, and chimneys.
- E. Engineer reserves the right to prohibit the use of precast bases if, in Engineer's opinion, installations are not being properly made or the requirements of FIELD QUALITY CONTROL are not being met.

1.04 SUBMITTALS

- A. See Section 01300
- B. Shop drawings, catalog cuts and installation instructions for all materials to be furnished under this Section.
- C. Manufacturer's certification of compliance for (1) precast concrete sections, (2) brick, (3) joint materials, and (4) castings.
- D. Copy of NPCA plant inspection report indicating the manufacturer has been inspected in accordance with NPCA certification procedures within the past 18 months.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver precast manhole sections and bases to project site with the manhole designation, as shown on the Drawings, painted on the interior wall (e.g. M.H. A2).
- B. Carefully load, deliver and unload all materials in order to avoid any damage.
- C. Store materials so that they can be easily inspected and so that they will not be damaged prior to installation.
- D. Deliver cement, lime, hydraulic cement and dampproofing materials in manufacturer's sealed containers, clearly marked with the name of the product and manufacturer. Store in a weatherproof enclosure off the ground.

1.06 JOB CONDITIONS

- A. Provide Internal Drop Connections at manholes where entering sewer invert is 2 feet or more above the manhole invert, in accordance with the details shown on the Drawings.
- B. Install watertight manhole covers where shown on the Drawings and where directed by Engineer.
- C. Sanitary sewer manholes shall conform to the requirements of the latest edition of the State of Maine Wastewater Rules and as set forth in these specifications.

PART 2 PRODUCTS

2.01 PRECAST CONCRETE

- A. Conform to ASTM C478 with the following exceptions and additional requirements:
 - 1. The barrel shall not be less than five inches thick.
 - 2. Type II cement shall be used, except as otherwise approved.

3. Aluminum manhole steps shall be cast into the sections during manufacture of the sections. Reinforced plastic steps shall be inserted and tested at manufacturing site.
4. Sections shall be steam cured and shall not be shipped until at least five days after having been cast.
5. No more than two lift holes may be cast or drilled in each section.
6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of the barrel.
7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
8. Precast manhole bases shall be constructed so that the floor slab shall be an integral part of and poured monolithically with walls of the base. The base may extend six inches beyond the outside diameter of the walls. The tops of the precast manhole bases shall be properly shaped, by means of accurate bell-ring forms, to receive the barrel sections and to accommodate the type of joint to be used.
9. Cone and transition sections shall be eccentric in shape.

B. Diameter - As shown on the Drawings.

C. Height - As required to attain the proper elevation of the cover. Use risers of maximum practical length to minimize the number of joints.

D. Joints - As shown on the Drawings.

1. Horizontal joints for all precast section shall be tongue and groove.
2. Butyl Rubber - ConSeal CS-102 or approved equal meeting ASTM C990.

2.02 CONCRETE

A. All cast-in-place concrete shall be Class 'AA' with a 28-day compressive strength of 4,000 psi as specified in Division 3.

2.03 BRICK

A. ASTM C32, Grade SS, first quality, sound hard-burned clay brick, regular and uniform in shape and size and of compact texture.

2.04 MORTAR - MIX

- A. Portland Cement - ASTM C150, Type II.
- B. Sand - ASTM C33, concrete aggregate.
- C. Hydrated Lime - ASTM C207, Type S.
- D. Mortar shall consist of one part Portland cement to two parts sharp, clean masonry sand, by volume. Add 10 lbs. of hydrated lime for each bag of cement.
- E. Mix in a suitable mixer or watertight mixing box. Thoroughly mix the dry materials and then add sufficient water to bring the mixture to a workable consistency. The use of mortar which has begun to set and the re-tempering of the mixture by water addition are prohibited.

2.05 HYDRAULIC CEMENT

- A. "Sikaplug" by Sika Chemical Corp., "Waterplug" by Standard Dry Wall Products, Inc., or approved equal.

2.06 FLEXIBLE PIPE SLEEVES

- A. Cored Openings - "Kor-N-Seal" by Dukor Co., National Pollution Control Systems, Inc., or approved equal.

2.07 FRAMES AND COVERS

- A. Frames and covers are as shown on the drawings.

2.08 MANHOLE STEPS

- A. New Jersey Aluminum Extrusion Co., Inc. F-14-2-B, Alcoa No. 12653A, or copolymer polypropylene plastic, steel reinforced PS2-PFSL by M.A. Industries, Inc., or an approved equal.

2.09 BEDDINGS - PRECAST BASES

- A. Precast Base beddings are as shown on the Drawings.

2.10 REINFORCEMENT STEEL

- A. Reinforcing Bars shall be Grade 60.
 - 1. Billet steel bars shall conform to ASSHTO M 31.
 - 2. Rail steel bars shall conform to ASSHTO M 42.
- B. Welded steel wire fabric shall conform to ASSHTO M 55.

2.11 DAMPPROOFING

- A. Two coats of a bituminous waterproofing material shall be applied to the exterior surfaces by brush or spray in accordance with the manufacturer's recommendations.

- B. The bituminous waterproofing material shall be Minwax Fibrous Brush Coat as manufactured by the Tremco Manufacturing Company, Bituminous Black Solution as manufactured by the Koppers Company, Inc., or approved equal.

2.12 OTHER MATERIALS

- A. Provide all other materials, not specifically described but required for the complete and proper installation of manholes.

2.13 FABRICATION - PRECAST CONCRETE

- A. Fabricate all precast concrete sections in accordance with ASTM C478.
- B. Reinforce flat top sections as shown on the Drawings. Precast base slabs, when used, shall be reinforced as shown on the Drawings for cast-in-place concrete bases.
- C. Apply a heavy coat of alkali-resistant bituminous paint to the portions of aluminum steps which will be embedded into concrete.
- D. Space steps at 12 inches, center to center, to within \pm ½-inch. The lowest step shall be within 18 inches of a solid footing (e.g. manhole bench) upon which a person descending the steps would normally step. The uppermost step shall be set within 18 inches of the rim of the manhole cover to act as a handhold. If this step must be set in the brick corbel, it shall be set so as to extend 3 inches from the face of the brick to facilitate easy passage.
- E. Openings in precast sections to receive pipes shall be accurately cast, both vertically and circumferentially. Fabricate pipe openings with flexible, watertight joints as specified in FLEXIBLE PIPE SLEEVES. Where openings are incorrectly cast, remove the section from the Project site and replace with a satisfactory section. Cost for replacements attributed to improper manufacturing shall be borne by the Contractor. Where openings are incorrectly cast due to field changes, immediately notify the Engineer.

2.14 FABRICATION - CAST IRON AND DUCTILE IRON CASTINGS

- A. Castings shall be true to pattern in form and dimensions without sharp, unfilled angles or corners, and free from pouring faults, sponginess, cracks, blow holes, porosity, hard spots, shrinkage distortion and other defects in positions affecting their strength and value for service intended.
- B. Castings shall further be free from scale, lumps, blisters and other defects.
- C. Accurately fabricate frames and covers so that they will fit in any position without rocking. Mill horizontal fitting surfaces to a true and even surface to insure uniform bearing. Units and portions of units shall be interchangeable. For sanitary manhole covers, provide one or two lift holes located on the periphery of the cover.
- D. Cast or stamp the word, "SEWER" for sanitary sewers in letters 3 inches in height, into all manhole covers so as to be plainly visible.
- E. After casting, and prior to shipping, smooth and clean all surfaces by sandblasting.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that excavation is in the proper location, that pipes have been installed at the correct elevations and that the subgrade has been properly prepared.
- B. Do not install manholes until conditions are satisfactory.

3.02 ORIENTATION OF COVERS AND STEPS

- A. General - The intent of this paragraph is to secure covers in a position which provides for the safety of all, during and after construction of the Work, provides for convenient manhole ingress and egress, to minimize adverse, visual impacts and, in the case of sanitary manholes, to avoid the entrance of water through covers. Unless otherwise specified or directed by Engineer, orient the location of covers and steps by using the following criteria, with precedence given in the order presented.
- B. Safety - Give primary concern to safety considerations and for providing convenient access to manhole interiors.
- C. Covers and Drainage - When covers are located in, or adjacent to, swales, ditches, watercourses, depressions

and the like, orient covers so that they are as far as possible from standing or running water. In the event that a sanitary manhole cover lies within an area where runoff or water is likely to flow or pond over the cover, and a watertight cover is not specified, immediately notify Engineer, whereupon he may direct that a watertight cover be provided.

- D. Covers and Pavements - To avoid future problems with snow removal or street cleaning, orient covers to lie completely outside of paved surfaces, including walks and roadways. If this cannot be accomplished, locate cover completely in pavement. Covers partially within or outside of pavements are not permitted without the prior approval of Engineer. When covers occur in paved areas, locate entirely within a single traffic lane and as near to the edge of pavement as is possible, but no closer than 8" from the edge of pavement.
- E. Covers in Unpaved Areas - Avoid gardens and the like which may upset the present use of the area.
- F. Ingress/Egress - Coupled with the above, convenient and safe access to within the manhole must be evaluated. Coordinate cover location with pipe openings, manhole benches and inverts, safety landings and the like. Make every effort to locate steps on a wall with no pipe penetrations and, where rungs are not specified to be provided, consideration shall be given to the safest means of seating the feet of ladders which will be used for access to manhole interiors.
- G. Noncompliance - Noncompliance with the requirements of this paragraph may result in Engineer's disapproval of the entire manhole. When requested, Engineer will assist in determining the optimum location of covers and steps.

3.03 INSTALLATION

- A. Cast-in-Place Bases - Cast manhole bases in place at the locations and to the dimensions shown on the Drawings. Form the top of the wall of the base to fit the lower end of the first precast manhole riser section with an approved cast iron or steel palette. Palette shall be accurately shaped to the required section and profile to accommodate the joint material which, when riser section is assembled, shall make a uniform water tight joint.
- B. Precast Bases - Place bedding, level and tamp firmly in place. When absolutely necessary, pea stone may be used for minor adjustments in final leveling, but the depth

shall not exceed 3/4-inch. Carefully lower precast base in place, taking extra care not to shift the bedding, and align all openings with the pipes to be connected. Leveling of the base by tamping or pounding on the top of the precast product is prohibited. If base is not level, lift it out, readjust bedding and reset base. Continue this procedure until base is level.

- C. Connecting Piping - Whether using precast or cast-in-place concrete bases, use the short manhole connecting pipes as detailed on the Drawings. When using precast bases, firmly make up the flexible manhole joints in accordance with the manufacturer's instructions and fill annular spaces full with butyl rubber.
- D. Precast Risers and Top Sections - Thoroughly clean all joints of precast sections and install jointing material. With o-ring gaskets, liberally lubricate the joints and gaskets prior to snapping the gaskets onto the spigot groove of the section, in accordance with the manufacturer's instructions. Snap the gasket onto the spigot groove of the riser section. Insert a screwdriver or similar tool beneath the gasket and run it around the riser section to insure even seating. With butyl rubber, carefully position the material in place and overlap ends to secure a continuous watertight seal. Lower riser section into the bell of the base or previously placed riser section taking care that no dirt gets into joint, or onto gasket and that the gasket is not displaced. Place top sections on riser section in the same manner riser sections are joined together. Carefully align manhole rungs. Fill all lifting holes with hydraulic cement. Use 3-foot high eccentric conical top sections on all manholes, except where otherwise specified and where the distance from the top of the highest pipe to the finish grade is less than 4 feet.
- E. Refabricated Bases - If precast bases must be refabricated for any reason, the excavation at the structure location shall be immediately backfilled, if directed by Engineer. Lack of compliance is sufficient grounds to terminate the future use of precast bases.
- F. Manhole Chimney - Manhole chimneys shall be constructed of precast concrete grade rings thoroughly mortared to the manhole to produce a durable and watertight structure. Brick shall not be used. Construct chimney as detailed on the Drawings and to a height which will permit the setting of the frame and cover at the proper elevation.

Set frame on a bed of mortar not less than ½-inch thick. A thick ring of mortar extending to the outer edge of the masonry shall be placed to be flush with the top of the flange and have a slight slope to shed water away from the frame. Plaster interior and exterior surfaces of the corbel as shown on the Drawings. Keep mortar wet for a period of not less than 48 hours, protect from the weather, and do not permit freezing of the mortar to occur.

- G. Filling Precast Section Joints - Precast section joints shall be sealed with a butyl sealant rope meeting ASTM C-990. Reference product is ConSeal CS-102. Joints shall not be sealed by mortar unless specifically required elsewhere in the contract documents.
- H. Manhole Inverts (Channels and Benching) - Construct inverts to the general configuration shown on the Drawings and more specifically, to conform to the following requirements.
1. Construct channels to produce free, uniform, unobstructed and non-turbulent flows, without ponding, from each inlet pipe to the outlet pipe, and in a manner which will not produce freefalls, splashing or spraying of sewage onto manhole benches or walls.
 2. Completed inverts shall allow for easy, visual observations into pipes and readily permit the insertion of pipe plugs and sewer cleaning equipment.
 3. The bottom half of all channels shall be smooth semi-circles. When all pipes entering and leaving the manhole are the same size, the radius of each channel semi-circle shall equal the radius of the pipes. When there are only two pipes connected to the manhole, and the outlet pipe is larger than the inlet pipe, the channel shall uniformly increase in cross section across the full width of the manhole so that the radius of the channel semi-circle varies from the radius of the smaller pipe at the inlet to the radius of the larger pipe at the outlet. When two or more pipes enter a manhole and the outlet is larger than either inflowing pipe, the primary channel shall uniformly increase in cross section across the full width of the manhole and the secondary channel(s) shall maintain the cross section of the secondary pipe(s).
 4. Construct inverts for other combinations of pipes and pipe sizes along these lines. When the semi-circular channel bottom is completed, build the channel walls

vertically upward from the centerline of the pipe to a point which is level with the top of the pipe interior. This completed section is termed the channel.

5. Construct inverts with curves of the longest possible radii, tangent to the centerline of the pipes.
 6. Construct the benching by solidly filling in the area between the channel and the manhole walls. Slope the top surface of the benching towards the channel at a pitch of approximately ½-inch/ft. so that the liquid on the bench will easily drain into the channel. Provide as much bench area as is possible for standing on and make surface slightly roughened to attain a skid resistant finish.
 7. Where the top of benching intersects the channel, the resulting edge shall be rounded to a radius of approximately 1/2 - 3/4-inch. Where channels meet to form an acute angle, provide a rounded intersection with a radius of about 1-inch.
 8. Manhole inverts shall be formed from concrete cast directly into the base of the manhole. Manhole inverts shall be of a single casting with no joints. Manhole inverts shall not be constructed from brick.
 9. If required on the drawings or elsewhere in the contract documents, invert channels shall be lined with halved SDR 35 PVC pipe and fittings cast-in-place into the invert structure.
- I. Dampproofing - Dampproof all exterior surfaces of the manholes. Apply two coats in accordance with the approved manufacturer's instructions, each at the rate of one gallon per 75 square feet. The dampproofing shall be inspected prior to installation to insure that the coating is continuous over the exterior surface.
 - J. Penetrations Through Concrete - Only where absolutely necessary, penetrations shall be made through concrete by core drilling or by other approved means which will produce a hole of the minimum possible size and in a manner which will not affect the structural integrity of the concrete. In sanitary manholes, use a flexible pipe sleeve to connect the pipe and fill the annular space around the pipe with butyl rubber. In other manholes, insert the pipe into the opening and neatly fill the annular spaces with hydraulic cement.

3.04 FIELD QUALITY CONTROL

- A. All manholes shall be in satisfactory condition. The following is a partial list of unacceptable conditions which are not permitted:
- B. Manhole Plumbness - Not to exceed 1 inch in 8 feet.
- C. Defects in concrete surfaces including voids, honeycombs, cracks, patches, broken pieces and exposed reinforcement.
- D. Poorly formed, cracked or broken sections and joints.
- E. Incorrect location or elevations of pipe openings. Enlarging of openings and patching with any materials is prohibited.
- F. Incorrect location, spacing or alignment of manhole steps.
- G. Steps found loose; broken or cracked concrete.
- H. Leakage exceeding the rates allowed in Section 01666 or any visible leakage, whether the leakage test passed or not.
- I. Voids in the hydraulic cement joint filler.
- J. Defects in castings. Covers which rock or do not fully or properly seat with the frame.
- K. Precast bases not bearing on at least 80% of the bedding. Engineer reserves the right to require the removal of precast bases from the excavation to inspect the bearing surfaces.
- L. Joint filling, mortar plastering, dampproofing or other required work which has not been completed or has not been done properly or neatly.
- M. Inverts improperly shaped, not well rounded and not smooth.
- N. Ponding water in the invert and less than a 0.02 foot rise in inverts across the manhole.
- O. Covers set at wrong elevations or settlement of manhole or surrounding ground.
- P. Any other defect or deficiency in material or workmanship and any condition which may adversely affect the functioning of the manhole or system or its structural integrity.

3.05 ADJUST, REPAIR AND REPLACE

- A. Adjust all frames and covers, as required.

B. Repair or replace defective work.

END OF SECTION

SECTION 02605 - BURIED PIPE AND FITTINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Material and bedding requirements for all pipe and pipe fittings for underground pressure and nonpressure piping.

1.02 RELATED SECTIONS

- A. Section 01666 - Pipe and Manhole Leakage Testing
- B. Section 02315 - Excavation
- C. Section 02316 - Fill and Backfill
- D. Section 02317 - Trenching for Site Utilities
- E. Section 02901 - Restoration of Surfaces
- F. Division 3 - Concrete
- G. All work shall be in compliance with the requirements of the Town of Addison.

1.03 ABBREVIATIONS

(Also, see PIPE SCHEDULE 02605-1)

DI	Ductile Iron
PE	Polyethylene
HDPE	High Density Polyethylene
PVC	Polyvinyl Chloride
AC	Asbestos Concrete
VC	Vinyl Clay
SS	Stainless Steel

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements
- B. Brochures containing complete information and instructions pertaining to the storage, handling, installation, and inspection of pipe, fittings and joints furnished.
- C. Test certificates for the manufacturers' tests required under Paragraph 1.06.
- D. Pipe manufacturers' Certificates of Compliance on pipe, with each lot of pipe supplied. Immediately turn certificates over to Engineer. Materials delivered to the site without accompanying certificates will be subject to rejection.

1.05 QUALITY ASSURANCE

- A. Pipe and pipe fittings shall be produced in a plant of recognized reputation that is regularly engaged in the production of pipe conforming to the specified standards. Pipe and pipe fittings of the same type shall be the product of a single manufacturer.
- B. All pipe shall be manufactured in a plant of a member of the following organizations:

Pipe	Organization
DI	Ductile Iron Pipe Research Association
PVC, PE, HDPE	Plastics Pipe Institute

1.06 SOURCE QUALITY CONTROL

- A. General - The manufacturers shall test and furnish three copies of certificates covering all pipe and fittings supplied under this Section. Select test samples from the run of pipe proposed to be furnished to the Project. Unless Engineer elects to witness such testing, the manufacturer shall select the samples for testing. Advise Engineer at least two weeks in advance of the time and location of the testing.
- B. Polyethylene Pipe - Inspect and test PE Pipe in accordance with ASTM D1248.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Each length of pipe delivered to the site shall be clearly marked with the name of the manufacturer, class of pipe and pipe diameter. PVC sewer pipe shall be marked with the legend "SDR 35 PVC Sewer Pipe." Store in accordance with manufacturer's approved instructions.
- B. Carefully handle all pipe and fittings when loading and unloading. Lift pipes and fittings by hoists or lower on skid-ways in a manner to avoid shock. Lower pipe into trench with derricks, rope or other suitable equipment.
- C. Do not dump or drop pipe and fittings. Those that are dumped or dropped are subject to rejection by Engineer.
- D. Store PVC pipe under canvas or other opaque material which will allow air circulation but will eliminate the direct rays from the sun.

- E. Comply with all other recommendations of the manufacturers.

PART 2 PRODUCTS

2.01 HIGH DENSITY POLYETHYLENE (HDPE) STORM DRAIN

- A. This specification describes 4- through 60-inch dual wall water-tight pipe (per ASTM F2648) for use in gravity-flow land drainage applications. Pipe shall have a smooth interior and annular exterior corrugations.
- B. Joint Performance: Pipe shall be joined using a bell & spigot joint meeting ASTM F2648. The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall meet the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable, protective wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly. 12- through 60-inch diameters shall have an exterior bell wrap installed by the manufacturer.
- C. Fittings: Fittings shall conform to ASTM F2306. Bell and spigot connections shall utilize a welded bell and valley or saddle gasket meeting the watertight joint performance requirements of ASTM F2306.
- D. Field Pipe and Joint Performance: To assure water-tightness, field performance verification shall be accomplished by testing in accordance with ASTM F2487. Appropriate safety precautions must be used when field-testing any pipe material. Contact the manufacturer for recommended leakage rates.
- E. Material Properties: Material for pipe production shall be an engineered compound of virgin and recycled high-density polyethylene conforming with the minimum requirements of cell classification 424420C (ESCR Test Condition B) for 4- through 10-inch diameters, and 435420C (ESCR Test Condition B) for 12- through 60-inch diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%.
- F. Installation: Installation shall be in accordance with ASTM D2321, with the exception that minimum cover in trafficked areas for 4- through 48-inch diameters shall

be one foot and for 60-inch diameter the minimum cover shall be 2 ft. in single run applications. Backfill for minimum cover situations shall consist of Class 1 (compacted) or Class 2 (minimum 90% SPD) material. Maximum fill heights depend on embedment material and compaction level.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Pipe installations are specified in other Division 2 Sections under which the pipes are furnished and installed.

3.02 FIELD QUALITY CONTROL

- A. In the presence of Engineer, inspect each length of pipe delivered to the job for flaws, cracks, dimensional tolerances and compliance with the applicable specifications.
- B. Provide Engineer with suitable templates, calipers, feeler gauges and other equipment for checking pipes and fittings. Only pipes and fittings accepted by Engineer, and so marked, shall be installed in the Work.

END OF SECTION

SECTION 02705 - UNDERGROUND NON-PRESSURE PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnishing and installation of underground non-pressure piping, where shown on the Drawings and as listed in the Pipe Schedule in Section 02605.

1.02 RELATED SECTIONS

- A. Section 01666 - Pipe Leakage Testing
- B. Section 02315 - Excavation
- C. Section 02316 - Fill and Backfill
- D. Section 02317 - Trenching for Site Utilities
- E. Section 02605 - Buried Pipe and Fittings
- F. Section 02901 - Restoration of Surfaces

1.03 SUBMITTALS

- A. See Section 01300
- B. Shop drawings and catalog cuts of adapters for joining pipes of different materials and for plugs on stub-outs and on ends of building connections

1.04 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during the execution of this portion of the work and who shall be thoroughly familiar with the types of materials being installed, pipe loadings and the material manufacturers' recommended methods of installation and who shall direct all work performed under this Section.
- B. Pipe installation shall be done by skilled workers and each pipe laying crew shall have a pipe laying foreman.
- C. Accurately install pipe to the lines and grades shown on the Drawings, or as directed by Engineer, so that inverts are smooth and do not permit any water to be trapped or pond between structures or within manholes.
- D. A full circle shall be visible at the far end, when looking through pipes running from structure to structure.
- E. Deflections at joints are not permitted without the written consent of the Engineer and then shall be no more than one-half the manufacturer's recommended allowable deflection.

1.05 HANDLING

- A. Carefully handle all pipes and fittings when loading and unloading. Lift by hoists or lower on skidways in a manner to avoid shock and damage to the pipe.
- B. Use derricks, ropes or other suitable equipment for lowering pipe into trenches where required due to weight of material and for the safety and protection of workmen, materials, equipment, property and the Work.

1.06 JOB CONDITIONS

- A. Obtain permission from the Owner prior to shutting off water service in a main. Coordinate with the Owner and take adequate precautions to insure maximum fire protection for the affected areas when water service is shut off.
- B. Obtain permission from private owners prior to shutting off a water service.
- C. In the event that a water main or water service must be shut off because of an accidental interruption, immediately notify Engineer and the Owner or private owner, as applicable, to make arrangements to restore service and to provide temporary service, if required.
- D. Approval of Engineer is required prior to changing the location of any of the Work due to field conditions. Changes in pipe sizes are prohibited without a written consent from Engineer.
- E. All installed piping shall form completely connected systems including connections to valves, equipment, structures, existing facilities and appurtenances specified in other Sections to result in a satisfactorily operating installation.

1.07 PROTECTION OF WATER LINES

- A. Water and wastewater lines located in the same area shall be installed in accordance with "Ten State Standards" for Water and Sewage Blocks.
- B. Parallel Water and Sewer Lines - Pipelines carrying sewage, sludge or other wastewater, whether treated or not, shall not be located any closer than 10 feet horizontally from a potable water pipeline.
- C. Water and Sewer Line Crossings - Whenever water and sewer lines must cross, the sewer must be situated below the water line with at least an 18 inch clear vertical separation.

- D. Special Conditions - Parallel Lines - When it is impossible to achieve the requirements of Paragraph 1.06.B., immediately notify Engineer. If Engineer concurs, he will order the construction of the sewer with ductile iron, mechanical joint pipe and may order the reconstruction of the existing water line. The sewer line and the reconstructed water line shall be pressure tested for leakage in accordance with Section 01666.
- E. Special Conditions - Crossing Lines - When it is impossible to achieve the requirements of Paragraph 1.06.C., immediately notify Engineer. If Engineer concurs, he will order 1) the water line raised, 2) the construction of the sewer with ductile iron, mechanical joint pipe or, 3) the sewer line to be concrete encased.
- F. Water Lines Crossing Below Sewers - When it is impossible to achieve the requirements of any of the preceding paragraphs, immediately notify the Engineer. If Engineer concurs, he will order 1) the construction of the sewer with ductile iron, mechanical joint pipe, 2) the lowering of the water line to obtain a vertical separation of 18 inches between the bottom of the sewer and the top of the water line, 3) the sewer line supported by concrete cradle and 4) the water line be center under the sewer to maximize the distance from the sewer to the nearest joint. The sewer line and reconstructed water line shall be pressure tested for leakage in accordance with Section 01666.
- G. Additional work ordered under Paragraphs 1.06.D., E., and F. will be covered by a Change Order.

1.08 VERIFICATION OF EXISTING PIPING

- A. Due to the uncertainty of exact locations and depths of existing underground pressure pipes, it is a condition of this Contract that each proposed point of connection to an existing pipe be excavated to verify the data contained on the Drawings.
- B. Prior to the installation of any piping in the vicinity of a required connection, carefully excavate in the area of the connection, locate the existing pipe, determine the centerline elevation of the pipe, and make measurements to adjacent valves and other items which may be in conflict with the Work.
- C. If the information found differs from that shown on the Drawings, submit the data to the Engineer at least 5 days

prior to the anticipated date for making the connection and do not proceed with the connection until directed by the Engineer.

PART 2 PRODUCTS

2.01 PIPE, PIPE FITTINGS AND PIPE BEDDING

- A. Materials are specified in Section 02605.

2.02 PIPE ADAPTERS

- A. Join pipes of different materials with adapters specially manufactured for that purpose, and acceptable to Engineer.

2.03 CONCRETE FOR PIPE ENCASEMENTS AND CRADLES

- A. Class C concrete (2,000 psi) as specified in Division 3.

2.04 UNDERGROUND WARNING TAPE

- A. See Section 02706

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that trench conditions and pipe bedding are properly provided in accordance with Section 02221.
- B. Verify that pipe and fittings are in full compliance with these Specifications.
- C. Reinspect each length of pipe, fittings, and joints and remove from the Project site any damaged or defective materials.
- D. Do not install pipe until conditions are satisfactory.

3.02 PREPARATION

- A. Thoroughly clean pipe and fitting interiors, joint surfaces and gaskets prior to installation. Maintain pipes and fittings clean.

3.03 PIPE INSTALLATION - GENERAL

- A. Carefully lower pipes and fittings into the trench. Apply joint lubricant in accordance with the manufacturer's recommendations. Join pipe sections and fittings.
- B. Select pipe and fittings so that there will be as small of a deviation as possible at the joints and so that inverts present a smooth surface. Pipe and fittings which do not fit together to form a tight fitting joint are not permitted.

- C. Use only mechanical cutters for cutting pipe. All cut ends shall be examined for possible cracks caused by cutting.
- D. Install pipes to the required lines and grades using an accepted method of control. Engineer reserves the right to disallow a method of control, including those previously accepted, if, in Engineer's opinion, the method of control is not providing the accuracy required under the Contract.
- E. Install underdrain pipe with perforation down.
- F. Maintain cleanliness of installed pipe and fitting interiors throughout the Work. Plug ends when pipe installation is not in progress so that dirt, foreign matter, water, animals and people do not enter the pipe. Drainage of construction excavations through sanitary sewers is not permitted.
- G. Make connections between pipes of different materials with approved adapters. The encasement of adaptor made connections with concrete is not permitted.
- H. Commence pipe laying at the lowest point, with the spigot ends pointing in the direction of flow.
- I. Installing warning tape - See Section 02706

3.04 PIPE CONNECTIONS TO STRUCTURES

- A. All pipes connecting to manholes or other structures shall be connected as shown on the Drawings, or as specified in other Sections.
- B. Where not specifically shown on the Drawings or specified, install pipes so that a flexible pipe joint is located 2 feet from the outside face of the structure.

3.05 CONCRETE ENCASUREMENT AND CRADLES

- A. Encase pipe in concrete where shown on the Drawings.
- B. Encase pipe in concrete at utility crossings where required and in accordance with the detail shown on the Drawings.
- C. Provide concrete cradles where shown on the Drawings.
- D. Provide additional concrete encasements and cradles where directed by Engineer.
- E. The configurations, dimensions and limits of concrete are shown on the Drawings.

3.06 DISINFECTION

- A. Disinfect all potable water lines, services, valves, hydrants and appurtenances which were broken, damaged, contaminated or suspected of being contaminated.
- B. Disinfection shall conform to AWWA C651.

3.07 FIELD QUALITY CONTROL

- A. Afford Engineer access to the Work so that he may spot check the installations, or check each length of pipe immediately after it has been installed, or check it at any time after installation.
- B. Inspect pipe joints and verify that they have been properly installed and made up and free from sags and deflections.
- C. Perform leakage tests in accordance with Section 01666 and make any repairs and replacements necessary to meet the stipulated limits.
- D. Check piping to determine if any displacement of the pipe has occurred, after trench has been backfilled to full depth, by flashing a light between structures. If the illuminated interior of the pipe line shows poor alignment, displaced pipe, or any other defects, remove and reinstall piping until all requirements are met.
- E. Check flexible pipe for deflection 30 days after final backfilling using a rigid ball or mandrel of 95% of the inside diameter of the pipe. No mechanical pulling devices permitted.

3.08 ADJUST AND CLEAN

- A. Correct any section of piping that is found defective in material, alignment, grade, joints or damaged.
- B. In the event that dirt, debris or any other foreign material has entered any portion of the piping, flush the piping with clean water. Continue the flushing process until the piping is clean, as determined by Engineer.

END OF SECTION

SECTION 02741 - PAVEMENT REPLACEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Replacement of pavement and subbase materials removed or damages during installation of utility trenches.

1.02 RELATED REQUIREMENTS

- A. Division 2 - Site Work

1.03 REFERENCE STANDARDS

- A. State of Maine Department of Transportation, "Standard Specifications", 2020 Edition, including all addenda.
- B. Highway Department - State of Maine Department of Transportation, 16 State House Station. Augusta, Maine 04333-0016

1.04 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Name, address and telephone number of asphalt plant proposed for use and certification that the plant conforms to the requirements of these specifications.
- C. Names and descriptions of pavers, rollers and other equipment proposed for use.

1.05 PERFORMANCE REQUIREMENTS

- A. Paving replacement under this work item is limited to replacement of pavement over utility trenches. Pavement on all secondary roads will be installed to match existing thickness and as specified herein.

1.06 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during the excavation of this portion of the Work and who shall be thoroughly trained and experienced in the placing of the type of pavement specified and who shall direct all work performed under this Section.
- B. Use only personnel thoroughly trained and experienced in the skills required for installing and finishing, and in operating the required equipment.
- C. Perform Work in accordance with State of Maine Highways standard.

- D. All testing shall be performed by the approved testing laboratory. Engineer may use the testing laboratory for inspection services.

1.07 SCHEDULING

- A. Coordinate work with the work of other Sections to avoid delays and damage.
- B. Notify Engineer at least 24 hours in advance of the placing of any materials under this Section.
- C. Schedule work and operations to allow ample time for testing and inspection. Cooperate with Engineer and the testing laboratory and provide access to all phases of the Work.
- D. Place temporary pavement as specified or directed within 2 days after backfilling and compaction has been completed.
- E. Do not construct permanent pavement until after trenches have set a minimum of thirty (30) days. If it is not possible to schedule operations so this may be accomplished prior to the completion date, as stated in the Contract, an extension of time will be granted to complete this Work.

1.08 PROJECT CONDITIONS

- A. Remove any pavement, pavement foundation, or appurtenances damaged by construction operations to the extent ordered by the Engineer so that the whole roadway will have a true and uniform surface and will conform to the proper grade and cross sections.
- B. Neatly saw cut all pavements to be removed, creating as little damage as possible to the adjoining pavement.
- C. Comply with the requirements concerning weather limitations as specified in VAOT 406.04.
- D. Install permanent pavements between April 15th and November 15th, and then only when environmental conditions are satisfactory.
- E. Restore all disturbed gutters and curbs to a condition at least equal to that in which they were found immediately prior to beginning of operations.

1.09 REPLACING STATE HIGHWAY PAVEMENTS

Nothing contained herein shall relieve the Contractor from carrying out all orders given by the State Highway

Officials in connection with the replacement of pavement which is part of the State Highway System or State Aid Roads. Prior to doing any work which will affect a State Highway, a permit shall be obtained from the State of Maine Department of Transportation.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Temporary Pavement - Minimum 1-inch thickness of Bituminous Concrete, Type III, AC-20, VAOT 406.03.
- B. Bituminous Concrete Pavement - Conforming to materials and construction of Bituminous Concrete, Type III, AC-20, VAOT 406.03.
- C. Gravel Subbase - Conforming to requirements of VAOT 704.04. Thickness to match existing, or a minimum of 12-inches, whichever is greater.

2.02 MIXES

Bituminous concrete shall be mixed by the approved asphalt mixing plant in accordance with VAOT Section 406.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to the work of the Section, carefully inspect the installed work of all other trades and verify that all such work is complete, tested and approved by Engineer and to the point where this installation may be properly performed. Particulate attention shall be given to items such as pipelines so as to avoid excavating pavements at a later date.

3.02 PREPARATION FOR PAVEMENT REPLACEMENT

- A. Verify that utility trench has been backfilled and compacted to proper degree of compaction as specified in Section 02316.
- B. Gravel base course to have a thickness equal to the existing base course of a minimum of 12-inches thick, whichever is greater, after compaction to a minimum density of 95%.
- C. Place base course in maximum 6-inch lifts and compact with a mechanical tamper as described in VAOT 601.08.
- D. Remove all loose or damaged material in the existing pavement and trim back existing surface course as directed by the Engineer.

3.03 INTALLATION OF TEMPORARY PAVEMENT

- A. Install temporary pavement in areas specifically designated by the Engineer in writing.
- B. Comply with VAOT Section 406.

3.04 INSTALLATION OF BITUMINOUS CONCRETE PAVEMENT

- A. Remove and dispose of Temporary Pavement if utilized.
- B. Replace existing Bituminous Pavement 3-1/2 inches thick or less, in kind, to a thickness equal to the existing pavement.
- C. Replace existing Bituminous Pavement greater than 3-1/2 inches thick with 2-inches thick Binder Course, and 1-1/2 inches thick Wearing Course.

3.05 MAINTENANCE OF PAVEMENT

- A. Temporary Pavements - Maintain in a satisfactory condition until permanent pavement is constructed by repairing any damaged or deteriorated sections promptly as directed by the Engineer.
- B. Permanent Pavements - Maintain in a satisfactory condition until the expiration of the guarantee period by filling all depressions and holes with similar materials and keeping the pavement in a safe and satisfactory condition for traffic.

END OF SECTION

SECTION 02901 - RESTORATION OF SURFACES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Restoration of surfaces damaged or disturbed as a result of Contractor's operations.

1.02 RELATED SECTIONS

- A. Division 2 - Site Work

1.03 REFERENCE STANDARDS

- A. State of Maine Department of Transportation, "Standard Specifications", 2020 Edition, including all addenda.
- B. Highway Department - State of Maine Department of Transportation, 16 State House Station. Augusta, Maine 04333-0016

1.04 QUALITY ASSURANCE

- A. Provide at least one person who shall be present at all times during this portion of Work and who is thoroughly familiar with the types of materials being installed and the best methods for their installation and who shall direct all work performed under this Section.
- B. Grades and surfaces shall be restored so as to be equal to or better than the original conditions which existed at the time they were damaged or disturbed, except as otherwise specified or shown on the Drawings.
- C. Restoration of surfaces under the jurisdiction of Village, Town, County, State or other public authorities or public utilities shall be in accordance with the requirements of such authorities. Ascertain these requirements, procure necessary permits, arrange for required inspections, and pay all fees, deposits and other charges which may be required by the authorities.
- D. Existing pavements and walks to be restored shall be replaced with new pavement equivalent to or superior to the existing in quality, thickness, bearing capacity and surface finish, except where otherwise specified.
- E. Slate and flagstone sidewalk sections shall not move or rock when pressure is applied on any portion.
- F. Replacement curbs shall have the same dimensions and cross-section as the existing adjoining curbs and the same texture, finish, and appearance.

- G. Replaced pavements shall be free from all noticeable sags, settlements, bumps, humps, cracks or other defects. Other than possibly color, the replaced pavement shall be unnoticeable from the existing pavement.

1.05 SCHEDULING

- A. It is the intent of this Section to restore all surfaces as soon as possible so as to cause the least amount of inconvenience to all people and animals, to provide an aesthetically pleasing construction site, to protect lives, to ensure safety, to avoid property damage and to provide for orderly and safe traffic conditions.
- B. Rough grade all areas to be seeded or planted within 48 hours after installation of the work; finish grade within one week after installation of the work, topsoil within three weeks after installation of the work and seed as soon as conditions are satisfactory. Replant trees, shrubs and other vegetation as soon as possible.
- C. Replace traffic and business signs as soon as possible, but no later than 24 hours after installation of the work.
- D. Replace guide rails as soon as possible, but no later than 72 hours after installation of the work.
- E. Replace all items as soon as possible, with special attention directed at those which control traffic, protect property and lives, are essential to a persons livelihood, create hazards when not in place, or are otherwise deemed essential.
- F. The phrase "after installation of the work" means after the installation of the work which necessitated the removal of an item or items.

PART 2 PRODUCTS

2.01 REUSE OF EXISTING MATERIALS

- A. Curbs, walks, fences, walls, signs and other items which have been removed, knocked down, or displaced shall be replaced with existing materials when, in the opinion of Engineer, such materials are in acceptable condition. Where such materials have been damaged, marred, broken, or are otherwise in an unacceptable condition, provide replacements of equal or better quality, appearance, size and type.

PART 3 EXECUTION

3.01 SCHEDULING

- A. Carefully inspect the work installed under other Sections and verify that all such work is complete to the point where restoration of surfaces may properly commence and to insure against the unnecessary disturbance of restored surfaces at a later date.
- B. Verify schedule of work for conformance to allowable planting times.
- C. Do not begin restoration work until conditions are satisfactory.

3.02 GRASS AND LAWNS

- A. Comply with Section 02921 - TOPSOIL AND SEEDING.

3.03 BITUMINOUS CONCRETE PAVEMENT

- A. Comply with Section 02741 - PAVEMENT REPLACEMENT

3.04 SIDEWALKS

- A. Concrete - Extend replacement sections to the nearest contraction or expansion joints. Thoroughly compact subgrade and provide a 12" minimum base course of granular material under sidewalk. Compact base course and place concrete in accordance with Division 3 - CONCRETE. The minimum slab thickness shall be 5".
- B. Slate and Flagstone - Replace walks after backfill has been brought up to proper subgrade elevation and compacted. Place stones on a 2" bed of sand and adjust them to the proper line and grade, and to provide uniform bearing. Fill area between stones with mortar.
- C. Asphalt - Cut back undisturbed pavement as required in Section 02741. Thoroughly compact subgrade, install asphalt concrete and roll finished surfaces to match existing adjacent surfaces, as nearly as practicable.

3.05 CURBS

- A. Extend curb replacement sections to the nearest joint. Replace all damaged joint fillers.
- B. Granite and Stone - Reinstall curbs to line and grade.
- C. Concrete and Asphalt - Replace curbs in an approved manner so that the finished product is of the same size, shape and appearance as the existing curbs.

3.06 GUIDERAILS

- A. If, in the opinion of the Engineer, guide rails are carefully removed and protected and are in acceptable condition, they may be reused and reset in accordance with the requirements of Highway Department.
- B. If, in the opinion of the Engineer, Town, or Highway Department, guide rails are not carefully removed and protected and are damaged or destroyed by Contractor, replace the guide railing in accordance with the Highway Department requirements.
- C. Prior to performing work in the vicinity of guide railing, carefully examine all guide railing components and immediately report to Engineer and the Town any existing damage or deterioration. If the Engineer or Town determines that any component is not adequate for reuse, the Contractor will remove and dispose of such component, and the Town will furnish replacement parts to be used by Contractor when he replaces the railing, or, Engineer will direct Contractor to furnish all required replacement parts and a Change Order will be issued to cover the additional costs.

END OF SECTION

SECTION 02921 - TOPSOIL AND SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil for unpaved areas.
- B. Placing topsoil.
- C. Hydroseeding, mulching and fertilizer, fertilizer and liming unpaved areas within approved limits as directed by the Engineer or as shown on Drawings.

1.02 RELATED REQUIREMENTS

- A. Section 02310 - Site Grading: Preparation of subsoil and placement of topsoil in preparation for the work of this section.
- B. Section 02316 - Fill and Backfill: Topsoil material.

1.03 SUBMITTALS

- A. Section 01300 - Administrative Requirements, for submittal procedures.
- B. Proposed seed mixtures and manufacturer's recommended rate of application.
- C. Seed labels containing vendor's name, seed name, lot number, percentage of germination, percentage of purity, percentage of weed seed and percentage of inerts.
- D. Fertilize and lime labels containing manufacturer's name, brand name, type, weight and guaranteed analysis

1.04 QUALITY ASSUREANCE

- A. Provide at least one person who shall be present at all times during the topsoiling and seeding operations and who shall be thoroughly familiar with the types of materials being installed and the best methods for their installation and who shall direct all work performed under this Section.
- B. Establish a good stand of grass of uniform color and density.
- C. Sod may be used in lieu of seed, and shall be provided where specified, where shown on the Drawings, in areas where the establishment of grass may be difficult due to steep slopes or drainage flows, and where required to prevent erosion.
- D. Protect, maintain and care for all grassed areas.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.
- C. Maintain seeded areas immediately after placement until grass is well established and exhibits a vigorous growing condition. All work shall be guaranteed for a minimum of one year from the date of first acceptance of the Work or from the date when Engineer determines that Contractor has established a good, vigorous and healthy stand of grass of uniform color and density, whichever date is later.
- D. Final acceptance will be given by Owner after established grassed and sodded areas have been in place for one year in a vigorous and healthy condition.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Sodding and Seeding shall be done when the ground is workable and weather conditions are satisfactory to seed and fertilize.

1.07 GUARANTEE

- A. All work shall be guaranteed for a minimum of one year from the date of first acceptance of the Work or from the date when Engineer determines that Contractor has established a good, vigorous and healthy stand of grass of uniform color and density, whichever date is later.
- B. Final acceptance will be given by Owner after established grassed and sodded areas have been in place for one year in a vigorous and healthy condition.

PART 2 PRODUCTS

2.01 SEED MIXTURE

- A. Grade A quality, fresh and re-cleaned and proven to produce satisfactory growth in the locality of the Project.
- B. In existing grass areas, mixtures shall be comparable to existing grasses and, when established, shall match as nearly as practical, the existing undisturbed grass.

- C. Seed mixtures shall be as defined on the drawings, or if not shown on the drawings seed mixes shall be Winning Colors Tall Fescue Blend by Lebanon Turf (www.lebanonturf.com).

2.02 TOPSOIL

- A. Type as specified in Section 02316. Obtained from excavation and grading work or, if insufficient material is available, it shall be imported.

2.03 LIME

- A. Calcic or dolomitic ground limestone.
- B. Total carbonates - 85% minimum content.
- C. Magnesium oxide - 10% minimum content for dolomitic and high magnesium limes.

2.04 FERTILIZER

- A. Standard Commercial Grade dry, free-flowing type suitable for common spreader application - or - finely-ground, water soluble type suitable for power spray application - or - granular or pellet type suitable for application by blower equipment.
- B. Minimum content:
 - 10% total nitrogen
 - 6% available phosphoric acid
 - 10% water-soluble potash

2.05 SOD

- A. Firm, dense, even textured and showing good root development. Grasses shall be of the type required for the intended use, suitable for the climatic conditions at the Project site, and as approved by the Engineer.
- B. Sod shall have a compact growth and shall be reasonably free from weeds, plants, large stones and other objectionable or detrimental materials.
- C. All sod shall be living, healthy and showing signs of vigorous growth.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that all underground and above ground work has been

completed to the point where topsoiling and/or seeding operations may properly commence without unnecessary disturbances at a later date.

- B. Do not commence work under this Section until conditions are satisfactory.
- C. Loosen all ground surfaces to a minimum depth of 2 inches to facilitate bonding of the topsoil to the subgrade. Use discs, spike-tooth harrows, or other approved means.
- D. Clean surface of subgrade of all stones, sticks and rubbish larger than 2 inches in size and all litter and detrimental materials.
- E. After spreading, break up large, stiff clods and hard lumps, and rake off all stones and rocks larger than 1 inch in size, roots, litter, foreign matter, poisonous materials, and other materials which may be detrimental to the work. Dispose of all such materials off-site.
- F. Remove all topsoil spilled on highways, shoulders, sidewalks, driveways and other surfaces for which topsoil is not specified or required.

3.02 FERTILIZING

- A. Uniformly spread fertilizer at a rate of 25 pounds/1,000 square feet with a cyclone or broadcasting type spreader.

3.03 LIMING

- A. Apply separately at the rate of 50 pounds/1,000 square feet, prior to fertilizing, seeding, and sodding. Lime may be applied dry spreader or as an aqueous solution by spraying.
- B. After application, work lime into top 3 inches of topsoil and redress surface to smooth finish.

3.04 SEEDING

- A. Sow seed uniformly with a cyclone or broadcasting type spreader at a rate recommended by the seed vendor and as approved by Engineer. The rate shall be based upon "new lawn" requirements and shall not be less than 5 pounds per 1,000 square feet.
- B. Sow seed when soils are moderately dry and when wind does not exceed five miles per hour.

3.05 ROLLING

- A. Where rolling is required, compact soil lightly with a lawn roller, immediately after seed is sown.

3.06 MULCHING - GENERAL

- A. In grass areas, use a mulch, matting, or a blanket to protect the seeded areas. Apply within 24 hours after the seeding operation is completed.
- B. In open and wooded areas, mulching is optional, except where it is required for erosion control.

3.07 MAINTENANCE

- A. Properly maintain all turfed areas by watering, cultivation, wedding, mowing, reseeding, filling eroded areas and other repairs and replacements until final acceptance of the Work.
- B. Reseed all areas where seed has failed to germinate and where seeded areas have been damaged by erosion, people, vehicular traffic or other causes.
- C. After sod has started to grow, resod any areas or portions failing to show life. Resod as often as necessary in order to establish a healthy, growing sod.

END OF SECTION