MAINE DEPARTMENT OF INLAND FISHERIES & WILDLIFE

STEVE POWELL WILDLIFE MANAGEMENT AREA

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

SWAN ISLAND
LANDING BULKHEAD IMPROVEMENT

Maine Department of Inland Fisheries & Wildlife
270 Lyons Road
Sidney, ME 04330

October 22, 2015

Prepared By:

Gartley & Dorsky ENGINEERING SURVEYING
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00 11 13
Notice to Contractors

SWAN ISLAND
LANDING BULKHEAD IMPROVEMENT

Repair existing bulkhead and associated site improvements.

The cost of the work is approximately $ 300,000. The work to be performed under this contract shall be completed on or before *April 1, 2016.*

1. Sealed Contractor bids for the project noted above, in envelopes plainly marked "Bid for *Swan Island Landing Bulkhead Improvements*" and addressed to:
   Valerie Chiang
   Bureau of General Services
   77 State House Station
   Cross State Office Building, 4th Floor
   Augusta, Maine 04333-0077
   will be opened and read aloud at *the address shown above* at **2:00 p.m.** on ***November 17, 2015***. Bids submitted after the noted time will not be considered and will be returned unopened.

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.
   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.

4. Performance and Payment Bonds *are required* on this project.
   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.

5. Filed Sub-bids *are not required* on this project.

6. There *are no* Pre-qualified General Contractors on this project.

7. An on-site pre-bid conference *will* be conducted for this project.
   The pre-bid conference is *mandatory* for General Contractors and optional for Subcontractors and suppliers. Contractors who arrive late or leave the meeting early may be prohibited from participating in this meeting and bidding. *THE MANDATORY ON SITE PRE-BID MEETING IS WILL BE HELD ON NOVEMBER 5, 2015 @ 9:00 A.M.*

8. Bid Documents - full sets only - will be available on or about *October 24, 2015* and may be purchased *for $25* from:
   Gartley & Dorsky Engineering & Surveying
   59B Union Street
   Camden, ME 04843
   (207) 236-4365

9. Bid Documents may be examined at:

AGC Maine
188 Whitten Road
Augusta, ME 04332
Phone 207-622-4741 Fax 207-622-1625

Construction Summary
734 Chestnut Street
Manchester, NH 03104
Phone 603-627-8856 Fax 603-627-4524

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 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.

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 sum of the lowest acceptable bid plus any Alternate Bids the Owner elects to include.

2.3 The Owner is exempt from the payment of Federal Excise Taxes and Federal Transportation Tax on all shipments, as well as Maine State Sales and Use Taxes on items "…physically incorporated in real property …". The bidder shall not include these taxes in their bid. See Section 00 72 13 for additional information.

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 opening date and time.

3.3 A bid that contains an escalation clause is considered invalid.

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 shall include the cost of Performance and Payment Bonds in the bid amount if the bid amount will result in a construction contract value over $125,000, inclusive of alternate bids that may be awarded in the contract. Pursuant to 14 M.R.S.A., Section 871, Public Works Contractors' Surety Bond Law of 1971, subsection 3, the selected Contractor is required to provide these bonds before a contract can be executed. The form of bonds are shown in section 00 61 13.13 and 00 61 13.16.

3.6 Bidders may modify bids in writing 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 shall acknowledge on the bid form all Addenda issued in a timely manner. The Architect shall not issue Addenda affecting bidders less than 72 hours prior to the bid closing time. 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 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.

3.10 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.

00 41 13
Contractor Bid Form

SWAN ISLAND
LANDING BULKHEAD IMPROVEMENT

To: *Valerie Chiang*
Bureau of General Services
77 State House Station
Cross State Office Building, 4th Floor
Augusta, Maine 04333-0077

The undersigned, or "Bidder", having carefully examined the form of contract, general conditions, specifications and drawings dated *October 20, 2015*, prepared by *Gartley & Dorsky Engineering & Surveying* for *Swan Island Landing Bulkhead Improvements*, as well as 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:

_____ Dollars

$ _____

Allowances *are included* on this project.

1. Alternate bids *are included* on this project.
   Any dollar amount line below that is left blank by the Bidder shall be taken as a bid of $0.00.
   Alternate Bid prices are as follows:

   Alternate No. 1: Regrade and add reclaimed asphalt at entrance and boat ramp. Total area = ±1,375 ft² $ _____

2. The Bidder acknowledges receipt of the following addenda to the specifications and drawings:

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

3. Bid security *is required* on this project.
   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 this completed bid form submitted to the Owner.

4. Filed Sub-bids *are not required* on this project.

SWAN ISLAND
LANDING BULKHEAD IMPROVEMENT

5. The Bidder agrees, if this bid is accepted by the Owner, to sign the designated Owner-Contractor contract and deliver it, with any and all bonds and affidavits of insurance specified in the Bid Documents, 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, a Saturday, or a Sunday, in which case the aforementioned documents must be received before 12:00 noon on the day following the holiday or 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.

6. This bid is hereby submitted by:

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: _____

00 43 13
Contractor Bid Bond

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 day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of the bid due date.

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 ***Swan Island Landing Bulkhead Improvement***

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.

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 day, i.e.: 8th*** day of ***October***, ***2015***, which is the same date as that of the bid due date.

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.

AdvantageME:
Appropriation No: _____

STATE OF MAINE
Bureau of General Services
CONSTRUCTION CONTRACT

THIS AGREEMENT made the _____ day of _____ in the year ***2015*** by and between the State of Maine through the ***Maine Department of Inland Fisheries & Wildlife*** hereinafter called the *Owner* and ***Contractor company name*** hereinafter called the *Contractor.*

BGS Project No.: ***2555***
Other Project No.: _____

The *Owner* and the *Contractor* for the consideration hereinafter named agree as follows:

ARTICLE 1 SCOPE OF WORK
§ 1.1 The *Contractor* shall furnish all of the materials and perform all the work described in the specifications and shown on the drawings for the project entitled: ***Swan Island Landing Bulkhead Improvement***.

§ 1.2 The specifications and the drawings have been prepared by ***Gartley & Dorsky Engineering & Surveying***, acting as Designer and named in the documents as the Architect or Engineer. This firm has responsibilities for defining the scope of work governed by their agreement with the *Owner*, the specifications and the drawings, and the General Conditions and Special Provisions of the contract.

ARTICLE 2 COMPLETION DATE
§ 2.1 The work to be performed under this contract shall be completed on or before ***April 1, 2016***. For each calendar day the project remains uncompleted ***$750*** shall be charged as liquidated damages.

ARTICLE 3 CONTRACT SUM
§ 3.1 The *Owner* shall pay the *Contractor* for the performance of the contract, subject to additions and deductions provided by approved Change Orders in current funds as follows:
amount in words dollars and ***00***cents,
$0.00

ARTICLE 4 CONTRACT BONDS
§ 4.1 Contract bonds are not required if the contract amount is less than $125,000 unless bonds are specifically mandated by the contract documents.

§ 4.2 On this project, the *Contractor* ***shall*** furnish the *Owner* the appropriate contract bonds in the amount of 100% of the contract amount.

ARTICLE 5 PROGRESS PAYMENTS

§ 5.1 The *Owner* shall make payments on account of the contract as provided therein as follows: Each month 95% of the value, based on contract prices of labor and materials incorporated in the work and of materials suitably stored at the site thereof up to the first day of that month, as certified by the Architect or Engineer.

§ 5.2 The *Owner* may cause the *Contractor* to be paid such portion of the amount retained hereunder as he deems advisable.

ARTICLE 6 FINAL PAYMENT

§ 6.1 Final payment shall be due 30 days after completion and acceptance of the work, provided the *Contractor* has submitted evidence satisfactory to the *Owner* that all payrolls, material bills and other indebtedness connected with the work has been paid.

ARTICLE 7 CONTRACT DOCUMENTS

§ 7.1 The General Conditions of the contract, instructions to bidders, bid form, Special Provisions, the written specifications and the drawings, and any Addenda, together with this agreement, form the contract; they are as fully a part of the contract as if hereto attached or herein repeated.

§ 7.2 Specifications: ***01 35 43 Environmental Procedures, 31 05 13 Soils for Earthwork, 31 05 16 Aggregates for Earthwork, 31 23 16 Excavation, Trenching, 31 25 13 Erosion Controls, 31 32 19.23 Geotextile Layer Separation, 32 11 23 Aggregate Base Courses, 33 42 13 Pipe Culverts***

§ 7.3 Drawings: ***SV-1 (Topographic Survey), C-1 (Site Plan), C-2 (Site Details)***

§ 7.4 Addenda: ***"none"***

ARTICLE 8 OTHER PROVISIONS

§ 8.1 ***There are no other provisions***

The *Owner* and the *Contractor* hereby agree to the full performance of the covenants herein.

IN WITNESS WHEREOF the parties hereby execute this agreement the day and year first above written.

OWNER		CONTRACTOR	
(Signature)	*(Date)*	*(Signature)*	*(Date)*
(Printed name and title)		*(Printed name and title)*	
(Department name)		*(Contractor company name)*	

BUREAU OF GENERAL SERVICES			
Contract Reviewed by:		Contract Approved by:	
(Signature)	*(Date)*	*(Signature)*	*(Date)*
		Joseph Ostwald	
Project Manager/ Contract Administrator		*Director, Planning, Design & Construction*	

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 day, i.e.: 8th*** day of ***November***, ***2015***, which is the same date as that of the construction contract, for the construction of ***Swan Island Landing Bulkhead Improvement***, 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.

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 day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of 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 day, i.e.: 8th*** day of ***November***, ***2015***, which is the same date as that of the construction contract, for the construction of ***Swan Island Landing Bulkhead Improvement***, and shall fully reimburse the oblige for all outlay and expense with said oblige 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.

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 day, i.e.: 8th*** day of ***select month***, ***select year***, which is the same date as that of 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 71 00
Definitions

1. Definitions

1.1 *Addendum*: A document issued by the Architect 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*: The Architect or Engineer acting as Professional-of-Record for the project. The Architect is responsible for the design of the Project.

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 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.

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 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.

1.12 *Certificate of Substantial Completion*: A document developed by the Architect 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 also include a provisional list of items (a "punch list") remaining to be corrected by the Contractor, if any, and identifies a 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 Architect and approved by the Bureau.

1.15 *Change Order Proposal (COP)*: Change proposed by the Contractor in the contract amount, requirements, or time, which becomes a Change Order when approved by the Owner.

1.16 *Clerk of the Works*: The authorized representative of the Architect on the job site. Clerk of the Works is also called Architect's representative.

1.17 *Construction Change Directive (CCD)*: A written order prepared by the Architect and signed by the Owner and Architect, 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 Price*: The dollar amount of the construction contract, also called *Contract Sum.*

1.22 *Contract Time*: The designated duration of time to execute the Work of the contract, with a specific date for completion.

1.23 *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.

1.24 *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.

1.25 *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.

1.26 *Final Completion*: Project status indicating when the Work is fully completed in compliance with the Contract Documents. Final Completion is documented by a date on which the Contractor's obligations under the contract are complete and accepted by the Owner and final payment becomes due and payable.

1.27 *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.

1.28 *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 Architect and Contractor.

1.29 *Owner's Representative*: The individual or entity contracted by the Owner to be an advisor and information conduit regarding the Project.

1.30 *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.

1.31 *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.

1.32 *Post-Bid Addendum*: Document issued by the Architect that defines a potential Change Order prior to signing of the construction contract. The Post-Bid Addendum allows the Owner to negotiate 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.

1.33 *Project*: The construction project proposed by the Owner to be constructed according to the Contract Documents. The entire public improvement project may also include separate construction and other

activities conducted by the Owner or other contractors. The Owner shall inform all contractors of the scope of the entire public improvement project relative to each individual contract.

1.34 *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. After acceptance by all parties a proposal amends the contract and is implemented by the Contractor.

1.35 *Proposal Request (PR)*: An Owner's written request to the Contractor for a Change Order Proposal.

1.36 *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.

1.37 *Request For Information (RFI)*: A Contractor's written request to the Architect 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 Work.

1.38 *Request For Proposal (RFP)*: An Owner's written request to the Contractor for a Change Order Proposal.

1.39 *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.*

1.40 *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.)

1.41 *Sample*: A physical example provided by the Contractor which illustrates materials, equipment or workmanship and establishes standards by which the Work will be judged.

1.42 *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.

1.43 *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*.

1.44 *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.

1.45 *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.

1.46 *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.

1.47 *Substantial Completion*: Project status indicating 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.

1.48 *Superintendent*: The representative of the Contractor on the job site, authorized by the Contractor to receive and fulfill instructions from the Architect.

1.49 *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.

1.50 *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

Table of Contents of this General Conditions Section

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 Architect. The purpose of this conference is to:

a) introduce all parties who have a significant role in the Project, including:
Owner (State Agency)
Bureau of General Services (BGS)
Architect
Consultants
Clerk-of-the-works
Contractor (GC)
Superintendent
Subcontractors
Other State agencies
Owner's Representative
Construction testing company
Commissioning agent
Special Inspections agent;

b) review the responsibilities of each party;

c) review any previously-identified special provisions of the Project;

d) review the Schedule of the Work calendar submitted by the Contractor to be approved by the Owner and Architect;

e) review the Schedule of Values form submitted by the Contractor to be approved by the Owner and Architect;

f) establish routines for Shop Drawing approval, contract changes, requisitions, et cetera;

g) discuss jobsite issues;

h) discuss Project close-out procedures;

i) provide an opportunity for clarification of Contract Documents before work begins;

j) 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 Architect and authorized in writing by the Architect, 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 Architect in writing of such errors or omissions. The Architect shall make any corrections or clarifications necessary in such a situation to document the true intent of the Contract Documents.

3. Additional Drawings and Specifications

3.1 The Owner shall provide to the Contractor, at no additional expense to the Contractor, a reasonable quantity of additional Drawings and Specifications for the execution of the Work.

3.2 The Architect shall promptly furnish additional revised Drawings and Specifications that are created due to corrections or clarifications made by the Architect. 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. Record of Documents

4.1 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 Architect.

4.2 The Contractor shall maintain, continuously updated, complete records of Requests for Information, Architectural Supplemental Instructions, Information Bulletins, supplemental sketches, Change Order Proposals, Change Orders, Shop Drawings, testing reports, et cetera, for access by the Owner and Architect.

5. Ownership of Contract Documents

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

6. Shop Drawings

6.1 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.

6.2 The Architect 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.

6.3 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.

6.4 The Contractor shall make any corrections required by the Architect, and shall submit a quantity of corrected copies as may be needed. The acceptance of Shop Drawings or schedules by the Architect 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 Architect at the time of submission and secured the Architect’s written approval. The acceptance of Shop Drawings or schedules by the Architect does not relieve the Contractor from responsibility for errors in Shop Drawings or schedules.

7. Samples

7.1 The Contractor shall furnish for approval, with reasonable promptness, all samples as directed by the Architect. The Architect 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.

8. Substitutions

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

8.2 The Contractor may submit detailed information about a proposed substitution to the Architect 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 Architect. The request for substitution shall include a cost comparison and a reason or reasons for the substitution.

8.3 The Architect 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 Architect should briefly state the rationale for the decision. The decision shall be considered final.

8.4 The duration of a substitution review process can not be the basis for a claim for delay in the Schedule of the Work.

9. Patents and Royalties

9.1 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.

9.2 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.

10. Surveys, Layout of Work

10.1 The Owner shall furnish all property surveys unless otherwise specified.

10.2 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.

10.3 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 Architect prior to commencing work.

11. Permits, Laws, and Regulations

11.1 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.

11.2 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.

11.3 The Owner is responsible for obtaining any federal agency project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.

11.4 The Owner is responsible for obtaining all easements for permanent structures or permanent changes in existing facilities.

11.5 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.

11.6 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 Architect 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.

11.7 The Contractor shall comply with local, state and federal regulations regarding construction safety and all other aspects of the Work.

12. Taxes

12.1 The Owner is exempt from the payment of Federal Excise Taxes on articles not for resale and from the Federal Transportation Tax on all shipments, as well as Maine State Sales and Use Taxes. Pricing in all Change Order Proposals from the Contractor and Subcontractors shall not include these taxes.

12.2 Maine statute (36 M.R.S.A. §1760) allows "…an exemption from sales and use tax on items which will be physically incorporated in real property of an exempt organization. This exemption only applies to lumber, hardware, doors and windows, nails, insulation and other building materials actually affixed to realty. Tools, wearing apparel, consumable supplies, machinery and equipment used by the Contractor are taxable even if purchased specifically for the exempt job."

12.3 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.A. §1760 and detailed in Rule 302 (18-125 CMR 302).

13. Labor and Wages

13.1 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.

13.2 The Architect 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.

13.3 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.

13.4 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.

13.5 The Contractor shall conform to Maine statute by providing to the Owner 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.

13.6 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.

13.7 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 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.

13.8 The Contractor may contact the Maine Department of Labor, 54 State House Station, Augusta, Maine 04333 for guidance on labor issues.

14. Insurance Requirements

14.1 The Contractor shall not commence work under this contract until the Contractor has obtained all insurance required under this article and such insurance has been approved by the Owner. The Contractor shall not allow any Subcontractor to commence work on a subcontract until all similar insurance required of the Subcontractor has been so obtained and approved.

14.2 The Owner does not warrant or represent that the insurance required under this article constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor and Subcontractors of every tier shall satisfy themselves as to the existence, extent and adequacy of insurance prior to commencement of work.

14.3 The Contractor and any Subcontractor shall procure and maintain for the duration of the Project insurance of the types and limits set forth under this article and such insurance as will protect themselves from claims which may arise out of or result from the Contractor’s or Subcontractor’s execution of the work, whether such execution be by themselves or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The insurance coverage provided by the Contractor and any Subcontractor will be primary coverage.

14.4 Workers' Compensation Insurance

Worker's Compensation insurance for all employees on 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

14.5 Liability Insurance

a) General Liability Insurance

General liability insurance 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. It shall include collapse and underground coverage - as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a per 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

b) Automobile Liability Insurance

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 $1,000,000

c) Owners Protective Liability Insurance

For Contracts exceeding $50,000 in total Contract amount, Contractor shall secure an Owners Protective Liability policy naming the Owner as the Named Insured.

Minimum acceptable limits are:

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

d) Pollution Liability Insurance

In the event that any disruption, handling, abatement, remediation, encapsulation, removal, transport, or disposal of contaminated or hazardous material is required, the Contractor or its Subcontractor shall secure a pollution liability policy in addition to any other coverages contained in this section. The insurance shall be provided on an occurrence based policy and shall remain in effect for the duration of the Project.

Minimum acceptable limit is:

Each occurrence limit $1,000,000

14.6 Property Insurance

a) New Construction Only

The Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor and all Subcontractors as insureds as their interest may appear. The covered cause of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, testing and ensuing loss and shall include coverage for materials in transit and materials stored off site. Coverage shall be on a replacement cost and a completed value basis. Unless specifically authorized by the Owner, the limit of insurance shall not be less than the contract amount and coverage shall apply during the entire contract period until the Certificate of Substantial Completion is accepted by the Owner.

b) Renovations within and Additions to Existing Buildings Insured by State of Maine Risk Management Division

Insurance shall be provided by the Owner. The Owner shall provide the following Project information to the State of Maine Risk Management Division prior to commencement of the Work in order to initiate the insurance coverage: building name, street address and municipality, brief project description, project start date and completion date, contract dollar value, and Contractor name and address. Said insurance shall name the Contractor and all Subcontractors as insureds as their interest may appear. The covered causes of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, testing and ensuing loss and shall include coverage for materials in transit and materials stored off site. Theft coverage is not included and exclusions common to commercial property policies are applicable. The Contractor shall be responsible for a $500 deductible per occurrence. Unless specifically authorized by the Owner, the limit of insurance shall not be less than the contract amount and coverage shall apply during the entire contract period until the Certificate of Substantial Completion is accepted by the Owner. Verification of insurance will be furnished to the Contractor upon request. The Contractor may independently acquire, at the Contractor's expense, coverage in excess of that maintained by the State of Maine.

14.7 The Contractor shall provide four original copies of all certificates of insurance in a form, and issued by, companies acceptable to the Owner prior to commencement of work. The certificates shall name the Owner as certificate holder and, shall identify the project name and BGS project number. The certificates shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least thirty (30) calendar days prior written notice by registered letter has been given to the Owner.

15. Contract Bonds

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

15.2 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.

16. Allowances

16.1 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.

16.2 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.

17. Assignment of Contract

17.1 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.

18. Separate Contracts

18.1 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.

18.2 The Contractor shall promptly report to the Architect 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.

18.3 Similarly, the Contractor shall promptly report to the Architect and Owner any apparent deficiencies in their own work that would impact the proper execution or results of the Owner's other contractors.

18.4 The Contractor shall report to the Architect 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.

18.5 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.

19. Subcontracts

19.1 The Contractor shall not subcontract any part of this contract without the written permission of the Owner.

19.2 The Contractor shall submit a complete list of named Subcontractors and material suppliers to the Architect 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.

19.3 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.

19.4 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.

19.5 Neither the Contract Documents nor any Contractor-Subcontractor contract shall indicate, infer or create any direct contractual relationship between any Subcontractor and the Owner.

20. Contractor-Subcontractor Relationship

20.1 The Contractor shall be bound to the Subcontractor by all the obligations in the Contract Documents that bind the Contractor to the Owner.

20.2 The Contractor shall pay the Subcontractor, in proportion to the dollar value of the work completed by the Subcontractor, the dollar amount allowed to the Contractor at the time each Contractor's Requisition for Payment is approved by the Owner.

20.3 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.

20.4 The Contractor shall pay the Subcontractor on demand for subcontract work or materials as far as executed and fixed in place, less retainage, at the time the Contractor's Requisition for Payment is approved by the Owner, even if the Architect fails to certify a portion of the Requisition for Payment for a cause not the fault of the Subcontractor.

20.5 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.

20.6 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.

20.7 The Contractor shall give the Subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.

20.8 The Contractor shall pay the Subcontractor a just share of any fire insurance payment received by the Contractor.

20.9 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.

20.10 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.

20.11 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 Architect's instructions.

21. Supervision of the Work

21.1 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.

21.2 The superintendent represents the Contractor on the jobsite. Directives given by the Architect 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 Architect and Owner are not responsible for the acts or omissions of the superintendent or assistant superintendents.

21.3 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 Architect. 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 Architect that was not revealed by the superintendent in a timely way.

22. Observation of the Work

22.1 The Contractor shall allow the Owner, the Architect 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.

22.2 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.

22.3 The Contractor shall schedule inspections and obtain all required certificates of inspection for inspections by a party other than the Architect.

22.4 The Architect 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 Architect, the Contractor shall notify the Architect of the construction schedule in this regard. Work concealed or buried prior to the Architect's approval may need to be uncovered at the Contractor’s expense.

22.5 The Architect 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.

22.6 The Bureau shall periodically observe the Work during the course of construction and make recommendations to the Contractor or Architect as necessary. Such recommendations shall be considered and implemented through the usual means for changes to the Work.

23. Architect's Status

23.1 The Architect represents the Owner during the construction period, and observes the work in progress on behalf of the Owner. The Architect 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 Architect has authority to stop the work whenever such an action is necessary, in the Architect's reasonable opinion, to ensure the proper execution of the contract.

23.2 The Architect is the interpreter of the conditions of the contract and the judge of its performance. The Architect shall favor neither the Owner nor the Contractor, but shall use the Architect’s powers under the contract to enforce faithful performance by both parties.

23.3 In the event of the termination of the Architect'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 Architect relative to this contract shall be that of the former Architect.

24. Management of the Premises

24.1 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 Architect's directions shall not cause the use of premises to be impeded for the Contractor or Owner.

24.2 The Contractor shall not use the premises for any purpose other that 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.

24.3 The Contractor shall enforce the Architect'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.

24.4 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.

25. Safety and Security of the Premises

25.1 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.

25.2 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.

25.3 The Contractor shall designate, and make known to the Architect and the Owner, a safety officer whose duty is the prevention of accidents on the site.

25.4 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.

25.5 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.

25.6 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.

25.7 Damage to the Work, including that which is reasonably protected, shall be repaired or replaced at the expense of the party who caused the damage.

25.8 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 Architect may consult with the Contractor on such means and methods of construction, however, the ultimate responsibility lies with the Contractor.

25.9 The Contractor shall not jeopardize any work in place with subsequent construction activities such as blasting, drilling, excavating, cutting, patching or altering work. The Architect 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.

25.10 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.

25.11 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.

26. Changes in the Work

26.1 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.

26.2 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.

26.3 The Architect shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.

26.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Architect. 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.

26.5 The method of determining the dollar value of extra work shall be by:

a) an estimate of the Contractor accepted by Owner as a lump sum, or
b) unit prices named in the contract or subsequently agreed upon, or
c) cost plus a designated percentage, or
d) cost plus a fixed fee.

26.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods using the following rates. The rates include all overhead and profit expenses.

a) Contractor - for any work performed by the Contractor's own forces, 20% of the cost;
b) Subcontractor - for work performed by Subcontractor's own forces, 20% of the cost;
c) Contractor - for work performed by Contractor's Subcontractor, 10% of the amount due the Subcontractor.

26.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Architect shall review and certify the appropriate amount which includes the Contractor's overhead and profit. The Owner shall make payments based on the Architect's certificate.

26.8 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.

26.9 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.

26.10 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.

26.11 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.

26.12 The Architect may order minor changes in the Work, not involving extra cost, which is consistent with the intent of the design or project.

26.13 The Contractor shall immediately give written notification to the Architect 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 Architect. The Architect shall promptly investigate the conditions and respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Architect shall determine if the discovered conditions warrant a Change Order.

26.14 The Contractor shall, within ten calendar days of receipt of the information, give written notification to the Architect if the Contractor claims that instructions by the Architect will constitute extra cost not accounted for by Change Order or otherwise under the contract. The Architect shall promptly respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Architect shall determine if the Contractor's claim warrants a Change Order.

27. Correction of the Work

27.1 The Contractor shall promptly remove from the premises all work the Architect 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.

27.2 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 Architect. 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.

27.3 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 Architect. The Architect shall determine the status of all claimed defects.

27.4 The Architect 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.

28. Owner's Right to do Work

28.1 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 Architect 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.

28.2 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.

29. Termination of Contract and Stop Work Action

29.1 The Owner may, owing to a certificate of the Architect 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, 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: if the contractor is adjudged bankrupt, or makes a general assignment for the benefit of its creditors, or if a receiver is appointed due to the Contractor's insolvency, or if the Contractor persistently or repeatedly refuses or fails to provide enough properly skilled workers or proper materials, or if the Contractor fails to make prompt payment to Subcontractors or material or labor suppliers, or if the Contractor persistently disregards laws, ordinances or the instructions of the Architect, or is otherwise found guilty of a substantial violation of a provision of the Contract Documents.

29.2 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 Architect shall certify the expense incurred by the Contractor's default. This obligation for payment shall continue to exist after termination of the contract.

29.3 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 Architect, terminate this contract. The Contractor may then recover from the Owner payment for all work executed, any proven loss and reasonable profit and damage.

29.4 The Contractor may, if the Architect 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 Architect, with seven days written notice to the Owner and the Architect, stop the Work or terminate this Contract.

30. Delays and Extension of Time

30.1 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 Architect, 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 Architect shall determine the status of all claimed causes.

30.2 The contract shall not be extended for delay occurring more than seven calendar days before the Contractor's claim made in writing to the Architect. In case of a continuing cause of delay, only one claim is necessary.

30.3 The contract shall not be extended due to failure of the Architect to furnish drawings if no schedule or agreement is made between the Contractor and the Architect indicating the dates which drawings shall be furnished and fourteen calendar days has passed after said date for such drawings.

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

31. Payments to the Contractor

31.1 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 Architect. The Architect 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.

31.2 The Contractor shall submit an application for each payment ("Requisition for Payment") on a form approved by the Owner and Architect. The Architect may require receipts or other documents showing the Contractor's payments for materials and labor, including payments to Subcontractors.

31.3 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.

31.4 The Architect shall verify and certify each Requisition for Payment which appears to be complete and correct prior to payment being made by the Owner. The Architect 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.

31.5 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.

31.6 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 Architect 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.

31.7 Subcontractors may request, and shall receive from the Architect, copies of approved Requisitions for Payment showing the amounts certified in the Schedule of Values.

31.8 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 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.

31.9 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 (M.R.S.A. 5, Section 1746).

32. Payments Withheld

32.1 The Architect 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:

a) defective work not remedied;
b) claims filed or reasonable evidence indicating probable filing of claims;
c) failure to make payments properly to Subcontractors or suppliers;
d) a reasonable doubt that the contract can be completed for the balance then unpaid;
e) liability for damage to another contractor.

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

33. Liens

33.1 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.

33.2 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.

34. Indemnification

34.1 The Contractor shall indemnify and hold harmless the Owner, its officers, agents, and employees from and against any and all claims, liabilities and costs, including reasonable attorney's fees, for any or all injuries to persons, property or claims for money damages arising from the negligent acts or omissions of the Contractor, its employees or agents, officers or subcontractors in the performance of work under this Agreement.

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 Architect's decision on the quality of work shall be final.

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 Architect 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 Architect at the Contractor's expense.

35.4 The Contractor shall request clarification or revision of any design work by the Architect, 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 Architect 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 Architect 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 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 exactly cleaning is specified. The Contractor shall wash 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 Architect, 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, generally called the "punch list", to be corrected by the Contractor. The Architect shall document the successful completion of the Work in a dated Certificate of Substantial Completion, to be signed by Owner, Architect, and Contractor.

36.4 The Contractor shall not call for final inspection of any portion of the Work that is not complete and permanent 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.

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 Architect 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 Architect determines has followed the expected rate of progress.

37.4 The Architect 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:
More than $100,000 and less than $2,000,000	$750
More than $2,000,000 and less than $10,000,000	$1,500
More than $10,000,000	$1,500 plus $250 for each $2,000,000 over $10,000,000

38. Dispute Resolution

38.1 Mediation

a) In the event of a dispute between the parties which arises under this Agreement in which the dispute cannot be resolved through informal negotiation, the dispute shall be submitted to a neutral mediator jointly selected by the parties.

b) 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.

c) In any mediation between the Owner and the Architect, the Owner has the right to consolidate related claims between Owner and Contractor.

38.2 Arbitration

a) 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.

b) 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.

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

d) In any arbitration between the Owner and the Architect, 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)

End of Section 00 73 46

THIS DOCUMENT MUST BE CLEARLY POSTED AT THE PERTAINING STATE FUNDED PREVAILING WAGE CONSTRUCTION SITE

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

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

Title of Project --------Swan Island Landing Bulkhead Improvement

Location of Project –Richmond, Sagadahoc County

2015 Fair Minimum Wage Rates
Highway & Earthwork Sagadahoc County

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asphalt Raker	$12.00	$0.00	$12.00	Ironworker - Reinforcing	$20.00	$1.23	$21.23
Backhoe Loader Operator	$19.00	$0.71	$19.71	Ironworker - Structural	$22.65	$6.06	$28.71
Bricklayer	$23.24	$1.80	$25.04	Laborers (Incl.Helpers & Tenders)	$13.00	$0.78	$13.78
Bulldozer Operator	$18.00	$2.74	$20.74	Laborer - Skilled	$15.50	$2.47	$17.97
Carpenter	$19.00	$1.75	$20.75	Line Erector - Power/Cable Splicer	$27.42	$8.05	$35.47
Carpenter - Rough	$24.00	$1.90	$25.90	Loader Operator - Front-End	$16.29	$2.43	$18.72
Cement Mason/Finisher	$16.81	$0.74	$17.55	Mechanic- Maintenance	$16.20	$2.29	$18.49
Concrete Pump Operator	$19.00	$3.35	$22.35	Painter	$16.38	$3.50	$19.88
Crane Operator =>15 Tons)	$24.00	$4.81	$28.81	Paver Operator	$18.00	$2.06	$20.06
Crusher Plant Operator	$17.13	$2.85	$19.98	Pipelayer	$15.16	$2.17	$17.33
Diver	$23.00	$8.25	$31.25	Pump Installer	$22.00	$2.70	$24.70
Driller - Rock	$17.50	$4.86	$22.36	Reclaimer Operator	$20.75	$10.84	$31.59
Earth Auger Operator	$22.50	$8.14	$30.64	Rigger	$20.00	$3.18	$23.18
Electrician - Licensed	$23.63	$13.82	$37.45	Roller Operator - Pavement	$17.00	$1.44	$18.44
Electrician Helper/Cable Puller (Licensed)	$16.39	$3.23	$19.62	Screed/Wheelman	$17.50	$2.46	$19.96
Excavator Operator	$18.00	$2.53	$20.53	Stone Mason	$17.00	$0.00	$17.00
Fence Setter	$11.00	$0.00	$11.00	Truck Driver - Light	$17.00	$1.46	$18.46
Flagger	$9.00	$0.00	$9.00	Truck Driver - Medium	$13.13	$0.83	$13.96
Grader/Scraper Operator	$20.00	$4.90	$24.90	Truck Driver - Heavy	$14.50	$1.69	$16.19
Highway Worker/Guardrail Installer	$16.80	$3.56	$20.36	Truck Driver - Tractor Trailer	$16.00	$2.84	$18.84
Hot Top Plant Operator	$20.75	$10.84	$31.59	Truck Driver - Mixer (Cement)	$14.60	$0.68	$15.28

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

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.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $50,000 or more and any subcontractors to such a contractor.

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 with the Secretary of State.

Determination No: HI-136-2015

Filing Date: October 21, 2015

Expiration Date: 12-31-2015

A true copy

Attest: Pamela Megathlin

Pamela D Megathlin
Director
Bureau of Labor Standards

BLS 424HI (R2015) (Highway & Earthwork Sagadahoc)

SECTION 01 35 43 - ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.1 DEFINITIONS OF CONTAMINANTS

A. Sediment: Soil and other debris that has been eroded and transported by runoff water.

B. Solid Waste: Rubbish, debris, garbage, and other discarded solid materials resulting from construction activity.

C. Chemical Wastes: Includes salts, acids, alkalis, herbicides, pesticides, and organic chemicals.

D. Sanitary Wastes: Wastes characterized as domestic sanitary sewage.

1.2 ENVIRONMENTAL PROTECTION REQUIREMENTS

Contractor is advised that the project is subject to municipal standards and the standards of Maine Department of Environmental Protection Erosion and Sedimentation Control Law permit requirements (MRSA 38 § 420-C). Provide and maintain during the life of the Contract, environmental protection as defined herein. Provide environmental protective measures as required to prevent or control pollution that develops during normal construction practice. Provide environmental protection measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Prevent unauthorized placement of fill, any material, or any unauthorized disturbance of any natural resource. Comply with all federal, state, and local regulations pertaining to water, air, and noise pollution.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 PROTECTION OF NATURAL RESOURCES

No wetland shall be disturbed. Other natural areas shall be preserved in their existing condition or restored to an equivalent or improved condition upon completion of the work. Confine construction activities to areas defined by the work schedule, drawings, and specifications.

A. Land Resources: Except in areas indicated to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without special approval of the owner's representative. Do not fasten or attach ropes, cables, or guys to any existing nearby trees for anchorages unless specifically authorized. Where such special emergency use is authorized, the Contractor shall be responsible for any resultant damage.

1. Protection: Protect existing trees that are to remain and which may be injured, bruised, defaced, or otherwise damaged by construction operators. Remove displaced rocks from uncleared areas. Protect monuments and markers.

2. Repair and Restoration: Repair or restore to their original condition all trees or other landscape features scarred or damaged by the equipment operations. Obtain approval of the repair or restoration from the Engineer prior to its initiation.

3. Temporary Construction: Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, and all other vestiges of construction. Temporary roads, parking areas, and similar temporary use areas shall be graded in conformance with surrounding areas and revegetated, seeded, or sodded as required by the plans.

B. Water Resources: Perform all work in such a manner that any adverse environmental impact on water resources is avoided. Storage of hydraulic fluid is not permitted on-site. Quantities of bulk materials shall be reduced to a level acceptable to the owner's representative.

3.2 EROSION AND SEDIMENT CONTROL MEASURES

A. Burn-off: Burn-off of ground cover is not permitted.

B. Protection of Erodible Soils: All earthwork brought to final grade shall be immediately finished as indicated or specified. Protect immediately side slopes and backslopes upon completion of rough grading. Plan and conduct all earthwork in such a manner as to minimize the duration of exposure of unprotected soils, and in no case shall exposure exceed 7 days. Consult weather forecasts prior to exposing large areas of soil. Check erosion control measures before forecasted major storm events.

C. Temporary Protection to Erodible Soils: Utilize the following methods to prevent erosion and control sedimentation.

1. Vegetation and Mulch: Provide temporary protection on all side and back slopes as soon as rough grading is completed or sufficient soil is exposed

to require protection to prevent erosion. Such protection shall be by accelerated growth of permanent vegetation, temporary vegetation, mulching, or netting. Stabilize slopes by hydroseeding, anchoring mulch in place, covering with anchored netting, sodding, or such combination of these and other methods necessary for effective erosion control.

3.3 CONTROL AND DISPOSAL OF SOLID, CHEMICAL AND SANITARY WASTES

Pick up solid wastes and place in containers that are emptied on a regular schedule. The preparation, cooking and disposing of food is strictly prohibited on the project site. Conduct handling and disposal of wastes to prevent contamination of the site and other areas. On completion, leave areas clean and natural looking. Remove signs of temporary construction and activities incidental to construction of permanent work in place

A. Disposal of Rubbish, Garbage, and Debris: Dispose of rubbish, garbage and debris in accordance with the requirements specified herein.

B. Sewage, Odor, and Pest Control: Dispose of sewage through chemical toilets or comparable effective units and periodically empty wastes. Include provisions for pest control and elimination of odors.

C. Petroleum Products: Conduct fueling and lubricating of equipment and motor vehicles in a manner that affords the maximum protection against spills and evaporation. Dispose of lubricants to be discarded and excess oil in accordance with approved procedures meeting federal, state and local regulations.

3.4 DUST CONTROL

Keep dust down at all times, including nonworking hours, weekends, and holidays. Sprinkle or treat with dust suppressers, the soil at the site, haul roads, and other areas disturbed by operations. Petroleum products will not be used as suppressers. No dry power brooming is permitted. Instead use vacuuming, wet mopping, wet sweeping, or wet power brooming.

3.5 NOISE

No blasting or use of explosives is permitted without written permission of the owner's representative and then only during designated times.

END OF SECTION 01 35 43

SUMMIT
GEOENGINEERING SERVICES

GEOTECHNICAL REPORT

Steve Powell Wildlife Management Area – Bulkhead Replacement
Swan's Island Landing, Route 197/24
Richmond, Maine

Prepared for:

Gartley & Dorsky Engineering & Surveying, Inc.
59B Union Street, PO Box 1031
Camden, Maine 04843

Prepared by:

Summit Geoengineering Services
145 Lisbon St.
Lewiston, Maine

Project #14165
September 2015

SUMMIT
GEOENGINEERING SERVICES

September 24, 2015
SGS #14165

Gartley & Dorsky Engineering & Surveying, Inc.
Attn: William B. Gartley, P.E.
59B Union Street / PO Box 1031
Camden, Maine 04843

Reference: Geotechnical Report, Timber Bulkhead Replacement
Route 197/24, Richmond, Maine

Dear Will;

Summit Geoengineering Services, Inc. (SGS) has completed a geotechnical investigation for the proposed bulkhead replacement at the site referenced above. Our scope of services included the drilling of 4 borings behind the existing timber bulkhead and preparing this geotechnical report summarizing our findings and providing geotechnical recommendations for the construction and design of the replacement bulkhead wall.

Our scope of services for this project did not include an environmental site assessment or detailed investigation for the presence or absence of hazardous or toxic material on, below, or around the site. Any statements in this report related to the presence or absence of contaminated soil at the site are for informational purposes and are not intended to constitute an environmental assessment.

1.0 Project Description

The project consists of the replacement of the existing timber bulkhead wall and regrading of the gravel parking lot at the Swan's Island landing along Route 197/24 in Richmond, Maine. The existing wall consists of approximately 190 feet of wall length and approximately 2,000 square feet of wall face. Wall height ranges from approximately 3 feet to greater than 16 feet. Multiple localized "sinkholes" have appeared in the retained gravel parking area directly behind the wall, and visual inspection of the timber pieces shows signs of deterioration. We understand that a segmental block retaining wall will is desired to replace the timber cribbing wall. We further understand that all of the existing wall will be removed and that the grade behind the wall will be raised from approximately elevation 5 feet to elevation 6 feet.

The site is located on the western shoreline of the Kennebec River off of Route 197/24. Retained behind the existing timber wall, the site contains a gravel parking area and a concrete pier deck. The pier deck leads to an aluminum ramp which connects to a wooden boat docking float in front of the east face of the wall. The water level of the river at the site is subject to tidal changes. Based on a site plan provided by Gartley & Dorksy, we understand that the mean high water elevation at the site is at elevation 3.92 feet.

2.0 Explorations and Laboratory Testing

2.1 Explorations

Summit Geoengineering Services (SGS) observed the subsurface conditions at the site with the drilling of 4 borings on June 20, 2015. Borings B-1 and B-2 were drilled to refusal, ranging in depth from 20.3 feet to 20.8 feet below ground surface. Borings B-3 and B-4 were terminated at depths of 4.2 and 17.5 feet, respectively. Timber cribbing was encountered in Borings B-2 and B-4 from depths 6.5 feet to 8.9 feet below ground surface, therefore these borings had to be offset in order to get past this layer. The initial boring is labelled with an "A," and the offsets are labelled with a "B" or C."

The borings were advanced using hollow stem augers. During the borings, split spoon sampling was conducted at 2-foot or 5-foot depth intervals in general accordance with ASTM D1586 to collect blow counts and soil samples. Boring B-4C was advanced using 3" diameter vibrated casing. Field vane shear testing was performed in the soft, cohesive soils encountered below the timber cribbing in this boring. A Shelby tube sample was also collected.

The locations of the borings were marked by SGS prior to the day of drilling by measuring from surrounding landmarks. These locations can be seen in the SGS Boring Plan in Appendix A. The boring logs can be found in Appendix B.

2.2 Laboratory Testing

One Atterberg Limit test (*ASTM D4318*) and two natural moisture content tests (*ASTM D2216*) were performed in the laboratory on collected samples of the river sediment deposit from Boring B-1. Detailed results of the laboratory tests are provided in Appendix C. A summary of the test results are presented below:

LABORATORY TEST SUMMARY							
Boring	**Depth**	**USCS**	**Atterberg Limits**				**MC(%)**
			LL	**PL**	**PI**	**LI**	
B-1	10' to 12'	OH	57	45	12	1.84	67.1
B-1	15' to 17'	OH	-	-	-	-	54.0

3.0 Subsurface Conditions

3.1 Soil

The soil encountered at the site generally consists of ***fill*** overlying ***timber cribbing*** overlying ***river sediment*** overlying a thin layer of ***glacial till*** overlying ***bedrock***.

3.1.1 ***Fill.*** The fill at the site can be broken down into two sub-layers. The upper layer is described as brown to dark brown sandy gravel to gravelly sand with little to some silt. It is loose to compact, humid to damp, and ranges in thickness from 1 to 2 feet. Standard Penetration Test Blow Counts (SPT-N) in this layer ranged from 16 to 29 with an average of 21. It classifies as GP or SP-SM in accordance with the Unified Soil Classification System.

The lower fill layer consists of cobbles and boulders intermixed with gravel, sand, silt, clay, brick, wood, ash, and coal. The presence of the cobbles/boulders was evident from the difficulty encountered during drilling in these depths and from visual inspection through the face of the timber cribbing walls. Samples recovered from this layer are described as olive gray to black silt or gravel with some to no sand, little to no clay, and trace to frequent ash, brick, wood and coal. The thickness of this layer ranges from 4.5 feet to 6.5 feet. The layer terminates at the timber cribbing. A non-woven geotextile was present in Boring B-3 separating the upper and lower fill layers. The lower fill layer is very loose to dense, moist to wet, and classifies as ML, GP, or GM in accordance with the Unified Soil Classification System.

3.1.2 ***Timber Cribbing***. The timber cribbing is located directly below the fill layer and is approximately 1 foot thick. It was encountered at depths ranging from 6.5 to 8.9 feet below ground surface.

3.1.3 ***River Sediment.*** The river sediment was encountered in Borings B-1, B-2, and B-3 and is described as wet, very soft olive green to gray silty clay or clayey silt with frequent organics. The surface of this layer was encountered from 8 feet to 9 feet below ground surface (approximate elevation of -3 feet to -4 feet) and extended to the thin glacial till layer overlying bedrock. The thickness of the layer ranges from 12.3 feet to 12.8 feet. Laboratory testing of recovered river sediment samples resulted in moisture contents ranging from 54.0% to 67.1%, and a Plastic Limit (PL) of 45, a Liquid Limit (LL) of 57, and a Plasticity Index (PI) of 12. Field vane shear testing performed during Boring B-4 yielded undrained shear strength values from 200 psf to 350 psf, generally increasing with depth. SPT-N in this layer was either “weight of hammer” or 1, indicating very soft conditions. This soil classifies as OH in accordance with the Unified Soil Classification System.

3.1.4 ***Glacial till***. The glacial till was encountered in Borings B-1 and B-2 at a depth of approximately 20 feet, and is described as gray gravel with little to some sand and little silt. The layer is wet, dense, and is approximately 6” thick directly overlying bedrock. This soil classifies as GP in accordance with the Unified Soil Classification System.

3.2 Groundwater

Groundwater at the site is predominantly controlled by the water elevation of the Kennebec River, and is subject to the tidal fluctuations. During the day of the exploration, groundwater was measured in the bore holes ranging in depths from 4.0 feet to 6.8 feet (approximate elevation 1.0 feet to -1.8 feet). At the time of the measurements, the groundwater surface in the hole appeared to be slightly higher than the elevation of the Kennebec River, indicating that the local groundwater table may also contribute to the groundwater elevation. Based on a site plan

prepared by Gartley & Dorksy dated 10/27/14, the mean high water of the Kennebec River at the site is elevation 3.92 feet.

3.3 Bedrock

Bedrock was encountered at the site ranging from 20.3 to 20.8 feet below existing ground surface (approximate elevation -15.3 feet to -15.8 feet) in Borings B-1 and B-2. Bedrock mapping by the Maine Geological Survey classifies the bedrock at the site as the Nehumkeag Pong Formation, consisting predominantly of light gray, medium to coarse grained, non-rusty to slight rusty-weathering, plagioclase-quartz-biotite with some gneiss.

4.0 Evaluation

The key geotechnical issues for the design and construction of the new bulkhead wall includes the following:

- Potential for total/differential settlement of the new retaining wall system bearing on the soft river sediment deposit.
- Potential for global instability due to the new retaining wall system and the increase in fill height behind the wall.
- Potential for differential hydrostatic pressures from the slow-draining soil behind the wall and from local groundwater influence.
- Presence of the Kennebec River and its tidal fluctuations impacting the de-watering during construction.
- Presence of timber cribbing behind wall presenting excavation difficulty.

Considering the soft bearing soils underlying the proposed wall system, we believe that a reinforced segmental block retaining wall, or “mechanically stabilized earth” (MSE) is the best option as the new bulkhead retaining system. Segmental block walls are tolerant of some total and differential settlement, and the reinforcing geogrid of an MSE creates a lower bearing pressure on the subgrade and increases global stability. Thus, to account for the potential of settlements and global instability, we feel than an MSE structure is a good solution.

The proposed MSE wall will be subject to daily tidal fluctuations and influence from the local groundwater table. To avoid loading on the wall from water pressure behind the wall, it will be crucial to eliminate differential water elevations between the groundwater behind the wall and the elevation of the Kennebec River. To do this, adequate drainage will need to be provided directly behind the blocks as well as behind the retained soils. Recommendations for wall drainage are outlined in Section 5.3.

Construction of the new wall will require de-watering and removal of the existing timber wall. Furthermore, adequate space behind the proposed wall will be required to place the bottom layers of geogrid, as required by the design. A cofferdam will be needed to provide a water cut-off from the Kennebec River.

5.0 MSE Wall Design Recommendations

5.1. General

Based on the soft bearing soils below the wall and the potential for global instability, we recommend that the new retaining wall system to replace the existing timber cribbing consist of a segmental block retaining wall reinforced with geogrid, also known as a mechanically stabilized earth (MSE) system. We believe that if the recommendations provided in this report are followed, an MSE wall system will be an effective replacement for the existing timber cribbing wall.

We recommend that the new MSE system be designed using the National Concrete Masonry Association (NCMA) methodology for segmental block retaining walls, 3rd edition. To account for temporary construction loading, we recommend that a live load surcharge of a minimum of 250 psf, applied directly behind the wall, be included in the design. If anticipated loading from construction is higher than 250 psf (for instance, if the equipment used to remove the cofferdam is higher that this), the live load surcharge should be increased to reflect this condition. Wall designs should meet the requirements of internal and external stability.

We recommend that the geogrid used in the MSE consist of geosynthetic reinforcement with a minimum long term design strength of 1,800 pounds/foot. Additionally, we recommend that all geogrid follow a recommended minimum length of 75% of the total wall height and that a layer of geogrid be provided between the bottom two courses of blocks. Geogrid should not be installed below the bottom block course. SGS performed a global stability analysis based on the proposed wall geometry, the geogrid recommendations stated above, and the soil parameters provided herein. The computed global stability factors of safety are acceptable for these conditions. Retaining wall documents, including wall construction plans and computations, shall be provided prior to construction and be stamped by a Maine Licensed Professional Engineer.

5.2 Foundation Recommendations and Soil Properties

We recommend that the contact pressure beneath the MSE be limited to 3,000 psf. Total settlement and differential settlement is expected to remain within tolerable limits of the segmental block requirements.

Soil at the base of the wall should be reinforced and otherwise improved as follows. The subgrade improvement methods assume that the base of the wall is dewatered during construction. The water level should be maintained at least 3 feet below the bottom of the deepest excavation.

- The leveling pad trench should be overexcavated into the river sediment deposit to a depth of 30."
- Once the leveling pad trench is excavated and dewatered; a geotextile consisting of Mirafi 1100N (or equivalent) should be installed from the face of the cofferdam along the exposed native soil into the leveling pad trench and extended along the entire excavated slope behind the wall.

- 18” of ¾” crushed stone leveling pad should be placed in the leveling pad trench. A 6” layer of the ¾” crushed stone should be carried along the entire base of the excavation for the blanket drain, as discussed in Section 5.3. The crushed stone should be compacted with a walk-behind plate compactor.

Once the subgrade is prepared, the wall can be constructed as follows:

- The bottom course block is embedded in a minimum of 12” of ¾” crushed stone.
- A minimum of 12” of ¾” crushed stone column is provided behind the blocks for the entire wall height. A rigid perforated PVC pipe is provided at the bottom of this drainage layer and properly outletted.
- A curtain drain is installed in accordance with Section 5.3.
- All soil placed within the reinforced soil zone consists of Reinforced Structural Fill (RSF, see table below for gradation requirements) compacted to 90% of its optimum dry density in accordance with ASTM D1557.
- A minimum of 2’ of riprap is placed in front of the bottom block course. The riprap should consist of 6” to 12” diameter stone and can be sloped down at a 1V:1H slope.

A typical cross section of the proposed MSE wall is provided in Appendix A.

The portion of RSF passing the 3” sieve shall meet the following gradation requirements:

REINFORCED STRUCTURAL FILL (RSF)	
Sieve Size	**Percent finer**
3 inch	100
½ inch	35 to 80
¼ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type D

The maximum particle size should be limited to 4 inches. Reinforced Structural Fill should be placed in 6 to 12 inch lifts and should be compacted to a minimum of 90% of its maximum dry density, determined in accordance with ASTM D1557.

We recommend that the following soil properties be used in the wall design:

DESIGN PARAMETERS - SEGMENTAL BLOCK RETAINING WALLS				
Soil	**Soil Description**	**Unit Weight**	**Shear Strength**	
			Phi	**C (psf)**
[1]Foundation	Native Silty Clay	115 pcf	25^o	0
Retained	Native Silty Clay	115 pcf	25^o	0
	Existing Fill	130 pcf	30^o	0
[2]Reinforced	Reinforced Structural Fill (RSF)	135 pcf	34^o	0
Crushed Stone Leveling Pad	¾" Crushed Stone	115 pcf	40^o	0

[1] Shear strength parameters are based on the drained strength of the soil.
[2] Assuming the placed soil is compacted to a minimum of 90% of its maximum dry density, determined in accordance with ASTM D1557.

5.3 Drainage

To avoid excessive hydrostatic loading behind the wall due to differential water pressures or rapid drawdown conditions, it is important to provide adequate drainage behind the wall. We recommend that in addition to a 12" minimum thick, ¾" stone column directly behind the wall, an additional chimney drain be installed on the face of the excavated slope during the placement of the RSF. The two stone columns should be connected with a 6" thick, ¾" stone blanket drain along the base of the wall excavation. The curtain drain should be carried up to at least elevation 3.92 feet (mean high water elevation). A cross section showing the recommended drainage system behind the wall is provided in the Typical Wall Cross Section in Appendix A.

6.0 Construction Considerations

The excavation for the new retaining wall will need to be dewatered. This will require a cofferdam to cut off the Kennebec River as well as a dewatering system from the influence of the local groundwater table. As the wall height is built up, the dewatering system can follow the bottom of the wall excavation.

The sheeting of the cofferdam should be located between 3 and 5 feet away from the face of the bottom course block. The cofferdam should not be removed until the entire wall height has been constructed and the fill behind the wall brought to finish grade.

Excavations in the native river sediment soil should be sloped no greater than 1.5H to 1V per OSHA requirements, Type C soil. In the existing fill, excavations should be slope at no greater than 1H:1V, per OSHA requirements Type B soil.

The existing timber bulkhead wall should be removed in its entirety. Existing fill and native soils on site are not reusable as RSF.

SGS should be retained to review the final wall design prior to construction to confirm its accordance with the recommendations provided in this report.

SGS should be retained to perform a subgrade inspection and confirm that the subgrade preparations are appropriate for the actual conditions present.

7.0 Closure

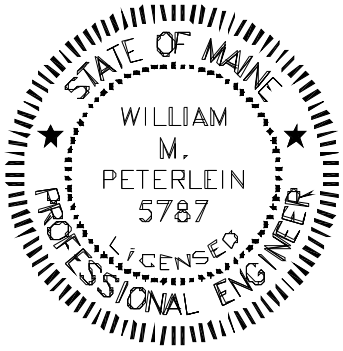
Our recommendations are based on professional judgment and generally accepted principles of geotechnical engineering. Some changes in subsurface conditions and the proposed development at the site from those presented in this report may occur. Should these conditions differ materially from those described in this report, or should wall height or configurations change significantly, SGS should be notified so that we can re-evaluate our recommendations.

We recommend that a qualified geotechnical consultant be retained to monitor and test soil materials used during construction and confirm that soil conditions and construction methods are consistent with this report.

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

Sincerely,
Summit Geoengineering Services, Inc.

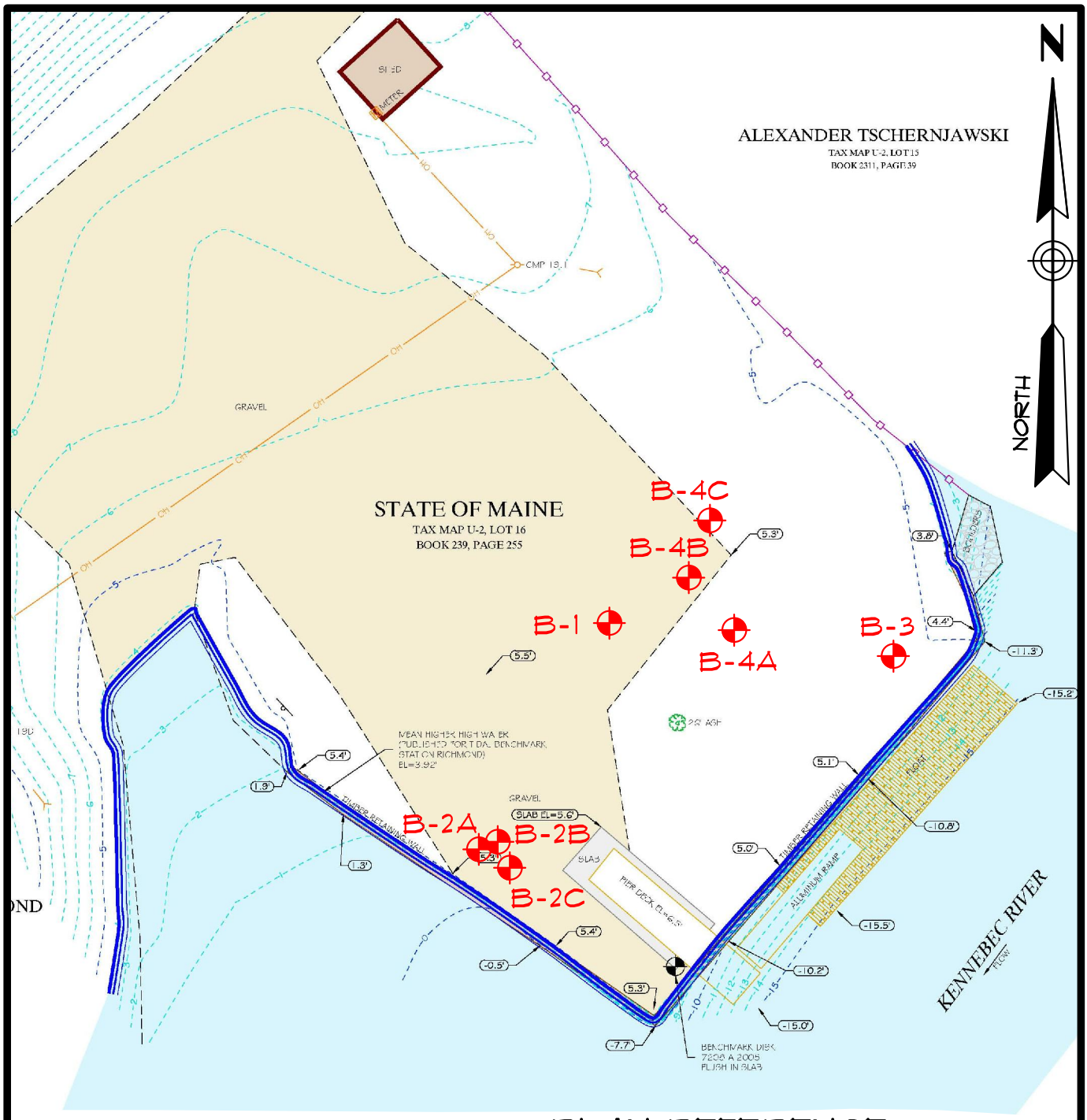
Mathew Hardison, EI
Geotechnical Engineer



William M. Peterlein, PE
Principal Geotechnical Engineer

APPENDIX A

FIGURES



LEGEND

B-1 — SUMMIT TEST BORING (JULY 20, 2015)

PLAN REFERENCE

"FEASIBILITY STUDY, PRELIMINARY SITE PLAN", DATED OCTOBER 27, 2014, PREPARED BY GARTLEY & DORSKY.

TEST BORING LOCATION PLAN
TIMBER BULKHEAD REPLACEMENT

RIVER ROAD - RICHMOND, MAINE

PREPARED FOR

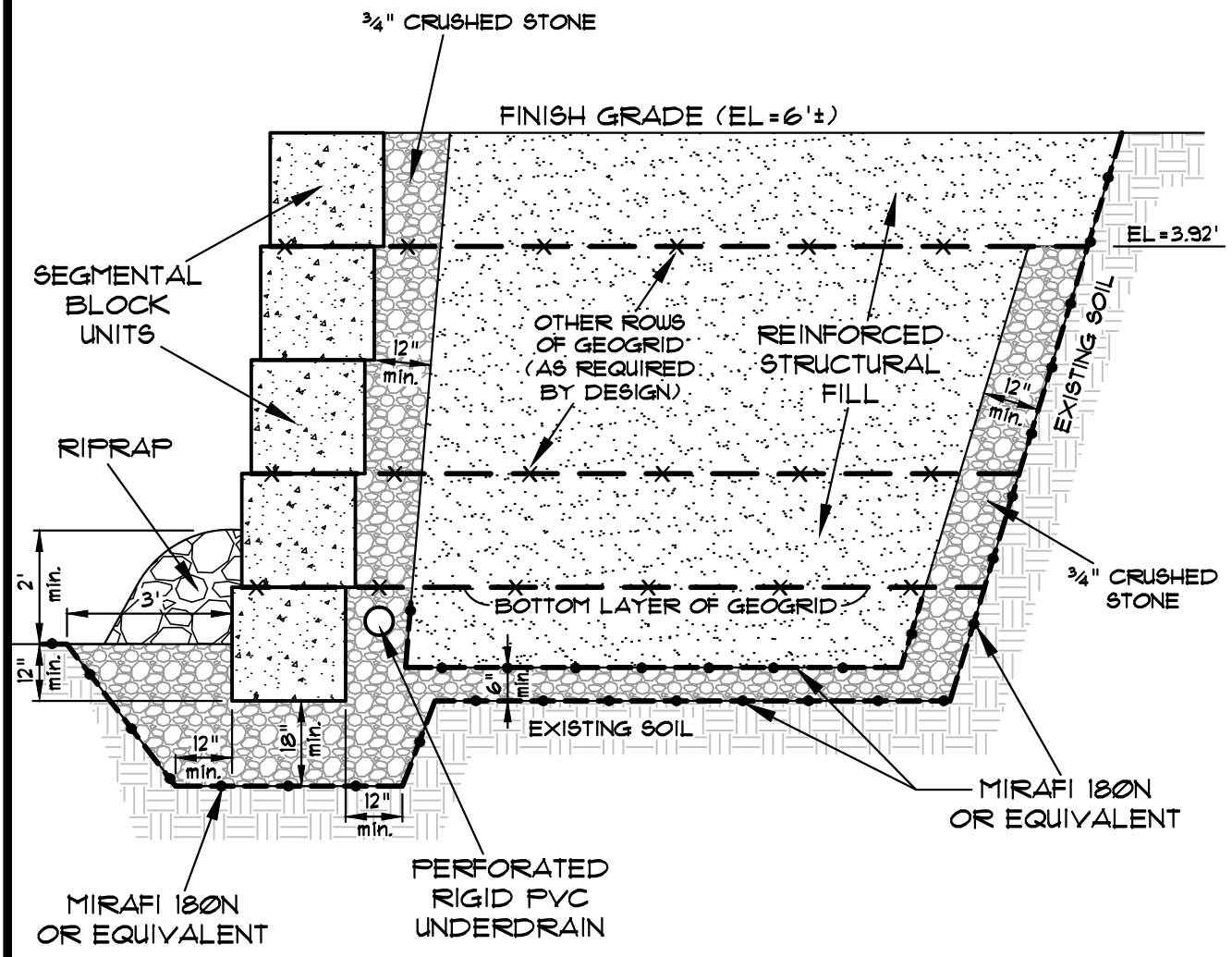
GARTLEY & DORSKY

DATE: 7-21-2015	DRAWN BY: KRF	CHECKED BY: WMP
JOB: 14165	SCALE: 1" = 20'	FILE: 14165 BOR

145 LISBON ST. - SUITE 601
LEWISTON, ME 04240
Tel.: (207) 576-3313

173 PLEASANT STREET
ROCKLAND, ME 04841
Tel.: (207) 318-7761

SUMMIT
GEOENGINEERING SERVICES
www.summitgeoeng.com



TYPICAL SCHEMATIC WALL CROSS SECTION

NOT TO SCALE

NOTE

THIS DETAIL DEPICTS THE FINAL WALL CONDITIONS AND DOES NOT NECESSARILY REPRESENT CONDITIONS DURING CONSTRUCTION OF THE WALL

RETAINING WALL DETAIL
TIMBER BULKHEAD REPLACEMENT

RIVER ROAD - RICHMOND, MAINE

PREPARED FOR

GARTLEY & DORSKY

DATE: 9-15-2015	DRAWN BY: KRF	CHECKED BY: WMP
JOB: 14165	NOT TO SCALE	FILE: 14165 BOR

145 LISBON ST. - SUITE 601
LEWISTON, ME 04240
Tel.: (207) 576-3313

173 PLEASANT STREET
ROCKLAND, ME 04841
Tel.: (207) 318-7761

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GEOENGINEERING SERVICES
www.summitgeoeng.com

APPENDIX B

BORING LOGS

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EXPLORATION COVER SHEET

The exploration logs are prepared by the geotechnical engineer from both field and laboratory data. Soil descriptions are based upon the Unified Soil Classification System (USCS) per ASTM D2487 and/or ASTM D2488 as applicable. Supplemental descriptive terms for estimated particle percentage, color, density, moisture condition, and bedrock may also be included to further describe conditions.

Drilling and Sampling Symbols:

SS = Split Spoon Sample
UT = Thin Wall Shelby Tube
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RW = Rotary Wash
SV = Shear Vane
PP = Pocket Penetrometer
RC = Rock Core Sample
Hyd = Hydraulic Advancement of Drilling Rods
Push = Direct Push of Drilling Rods
WOH = Weight of Hammer
WOR = Weight of Rod
PI = Plasticity Index
LL = Liquid Limit
W = Natural Water Content
USCS = Unified Soil Classification System

Water Level Measurements:

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations may not be possible, even after several days of observations. Groundwater monitoring wells may be required to record accurate depths and fluctuation.

Gradation Description and Terminology:

Boulders:	Over 12 inches	Trace:	Less than 5%
Cobbles:	12 inches to 3 inches	Little:	5% to 15%
Gravel:	3 inches to No.4 sieve	Some:	15% to 30%
Sand:	No.4 to No. 200 sieve	Silty, Sandy, etc.:	Greater than 30%
Silt:	No. 200 sieve to 0.005 mm		
Clay:	less than 0.005 mm		

Density of Granular Soils and Consistency of Cohesive Soils:

CONSISTENCY OF COHESIVE SOILS		DENSITY OF GRANULAR SOILS	
SPT N-value blows/ft	**Consistency**	**SPT N-value blows/ft**	**Relative Density**
0 to 2	Very Soft	0 to 4	Very Loose
2 to 4	Soft	5 to 10	Loose
5 to 8	Firm	11 to 30	Compact
9 to 15	Stiff	31 to 50	Dense
16 to 30	Very Stiff	>50	Very Dense
>30	Hard		

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GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	B-1
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015	5.4'	-0.4 ft +/-	10' of auger in hole (11:30 am)

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/8	0 to 2	11		Brown Sandy GRAVEL, little Silt, humid to damp,		
1				9		compact, GP		FILL
				7				
2				5				
						cobbles/boulders encountered in drilling		
3								
4								
								4.0'
5								
	S-2	24/8	5 to 7	1		Olive gray Sandy SILT, little Clay, occasional organics,	Groundwater	FILL (REWORKED
6				2		thin layer of wood at 6.5', wet, ML		NATIVE)
				5				
7				6				
						spoon tip: yellowish-orange to bright orange Brick		
8						fragments, Gravel, little Silt		
						easy drilling starting at 8'		8' +/-
9								RIVER SEDIMENT
10								
	S-3	24/20	10 to 12	1		Olive green to gray Silty CLAY, frequent organics (wood	PP < 500 psf	
11				WH		pieces), wet, very soft, OH	LL = 57	
				WH			PL = 45	
12				WH			PI - 12	
							MC = 67.1	
13								
14								
15								
	S-4	24/16	15 to 17	WH		same as above		
16				WH				
				WH			MC = 54.0	
17				WH				
18								
19								
20								
	S-5	24/3	20 to 22	12/3"		Gray Sandy GRAVEL, trace Silt, wet, dense, GP		20' +/- GLACIAL TILL
21						End of Exploration at 20.3', spoon refusal		BEDROCK
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	**B-2A**
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015	4.0 ft	1.0 ft +/-	open hole (8:30 am)

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/6	0 to 2	4		Brown Gravelly SAND, little to some Silt, humid, compact		
1				7		to loose, SP-SM		FILL
				11				
2				4				
						cobble encountered during drilling		
3								
4								
							Groundwater	4' +/-
5								
	S-2	24/10	5 to 7	17		Gravel and cobble piece, trace Brick fragments, wet		
6				8				
				18				
7				23		Wood pieces, probable timber cribbing		6.5'
						End of Exploration at 6.8', auger refusal on timber		TIMBER CRIBBING
8						cribbing		
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	B-2B
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015			

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
1						FILL (see B-2A)		FILL
2						cobble encountered during drilling at 2.6'		
3								
4								
5								
6								
7								
8						End of Exploration at 7.2', auger refusal on timber cribbing		TIMBER CRIBBING
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Boring #: **B-2C**

Project:	Timber Bulkhead Replacement	Project #:	14165
Location:	Route 197, Swan's Island Turnout	Sheet:	1 of 1
City, State:	Richmond, Maine	Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015			

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
1						FILL (see B-2A)		FILL
2								
3								
4								
5								
6								
7								
8						timber encountered during auger advance, drilled through with auger		7.0' TIMBER CRIBBING
9						easy drilling at 8'		8.0' +/- RIVER SEDIMENT
10								
11	S-3	24/0	10 to 12	1		no recoverery, likely wet, very soft SILT (see below)		
				WH				
12				1				
				WH				
13								
14								
15								
16	S-4	24/1	15 to 17	WH		Olive green to gray SILT, little to some Clay, wet, frequent organics, very soft, OH		
				WH				
17				WH				
18								
19								
20								
21	S-5	24/2	20 to 22	2		same as above		
				30/3"		2" Gray GRAVEL, little Sand, trace Silt, wet, dense, GP		20.2' GLACIAL TILL
22						End of Exploration at 20.8', spoon refusal		BEDROCK

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	B-3
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015	-	-	none encountered

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/6	0 to 2	4		3" Dark brown Sandy SILT, trace organics, humid, ML		TOPSOIL
1				2		Brown Gravelly SAND, little Silt, humid, loose, SP-SM		0.3'
				WH*		nonwoven geotextile layer at 1'		FILL
2				WH*				
	S-2	24/4	2 to 4	1		same as above, very loose		
3				2				
				1		*= lack of blow count likely due to void, inspection the		
4				2		open bore hole revealed cobbles/boulders directly below		
						geotextile		
5						End of Exploration at 4.2', auger refusal on cobble or		COBBLE/BOULDER
						boulder		
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	**B-4A**
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015	6.8 ft	-1.8 ft +/-	open hole (2:00 pm)

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/6	0 to 2	8		Brown to dark brown Gravelly SAND, little Silt, humid,		
1				10		compact, SP-SM		FILL
				19				
2				11				
	S-2	24/22	2 to 4	12		same as above		
3				4		Black to dark brown burnt wood and coal, some Silt,		2.4'
				3		trace Clay, loose, moist, ML		
4				3				
5								4.5' +/-
	S-3	24/10	5 to 7	7		Olive gray to orange SILT, frequent Brick fragments,		
6				7		trace to little Clay, occasional wood pieces, humid,		FILL (REWORKED
				6		compact, ML		NATIVE)
7				7				
	S-4	24/10	7 to 9	21		same as above, wet	Groundwater	
8				27				
				12				
9				14		End of Exploration at 8.9', casing refusal on timber		TIMBER CRIBBING
						cribbing		
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index
Bedrock Joints FV = Field Vane, s_u = undrained shear strength
Shallow = 0 to 35 degrees $s_{u(r)}$ = remolded shear strength
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	**B-4B**
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015			

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
1						FILL (see B-4A)		FILL
9						End of Exploration at 8.5', casing refusal on timber cribbing		TIMBER CRIBBING

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index
Bedrock Joints FV = Field Vane, s_u = undrained shear strength
Shallow = 0 to 35 degrees $s_{u(r)}$ = remolded shear strength
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	Timber Bulkhead Replacement	Boring #:	B-4C
Location:	Route 197, Swan's Island Turnout	Project #:	14165
City, State:	Richmond, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	5 ft +/-
Driller:	Craig Coolidge, P.E.	Reference:	"As-Built and Topographic Survey" by Gartley & Dorsky, dated 5/20/14
Summit Staff:	Mat Hardison, E.I.	Date started: 7/20/2015	Date Completed: 7/20/2015

DRILLING METHOD		SAMPLER	
Vehicle:	AMS Power Probe	Length:	24" SS
Model:	Tracked	Diameter:	2"OD/1.5"ID
Method:	3" Casing	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
7/20/2015	6.8 ft	-1.8 ft +/-	open hole (2:00 pm)

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	N_{60}	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
1						FILL (see B-4A)		FILL
9						timber encountered during auger advance		TIMBER CRIBBING
10								9' +/- RIVER SEDIMENT
11	FV1		10.7 to 11			s_u = 200 psf, $s_{u(r)}$ = 50 psf		
12	FV2		11.7 to 12			s_u = 300 psf, $s_{u(r)}$ = 50 psf		
13	FV3		12.7 to 13			s_u = 350 psf, $s_{u(r)}$ = 100 psf		
14	FV4		13.7 to 14			s_u = 350 psf, $s_{u(r)}$ = 100 psf		
15	UT1		15 to 17.5	Push				
16				Push				
				Push				
17				Push				
				Push				
18						End of Exploration at 17.5', no refusal		
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index
Bedrock Joints FV = Field Vane, s_u = undrained shear strength
Shallow = 0 to 35 degrees $s_{u(r)}$ = remolded shear strength
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

APPENDIX C

LABORATORY TEST RESULTS

SUMMIT
GEOENGINEERING SERVICES

Laboratory Determination of Water (Moisture) Content of Soil ASTM D2216 / D4643

PROJECT NAME:	Timber Bulkhead Replacement Richmond	PROJECT #:	14165
CLIENT:	Gartley & Dorsky Engineering & Surveying	DRYING METHOD:	Oven Dried
SOURCE:	Boring B-1	DESCRIPTION:	Various Clay Samples
DATE:	7/28/2015	TECHNICIAN:	Erika Hawksley, E.I.

Location	Sample No.	Depth	Moisture Content	Remarks
B-1	S-3	10' - 12'	67.1%	High organic content
B-1	S-4	15' - 17'	54.0%	High organic content

REMARKS:

145 Lisbon Street (PO Box 7216), Lewiston, Maine 04243, (207) 576-3313
173 Pleasant Street, Rockland, Maine 04841, (207) 318-7761

SUMMIT
GEOENGINEERING SERVICES

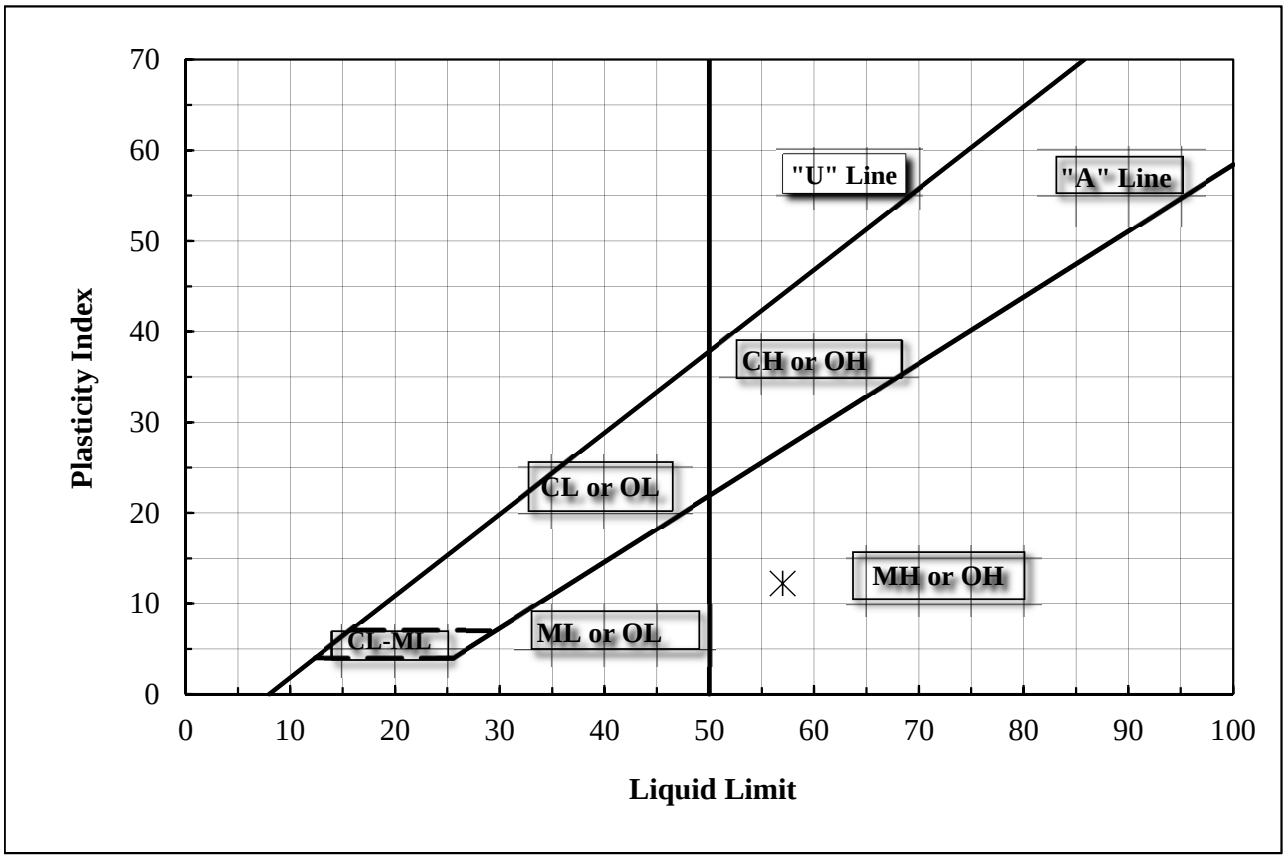
ATTERBERG LIMIT TEST - ASTM D4318

Method "A" (Multi-point)

PROJECT NAME:	Timber Bulkhead Replacement Richmond	PROJECT NUMBER:	14165
CLIENT:	Gartley & Dorskey Engineering	SAMPLE NUMBER:	B-1, S-3
SOURCE:	Boring B-1	DEPTH:	10'-12'
DATE:	7/28/2015	TECHNICIAN:	Erika Hawksley, E.I.

DATA

Source	Depth	LL	PL	PI	Classification
B-1	10'-12'	57	45	12	Gray organic Silty CLAY, OH



Notes: Sample has high organic content; including wood pieces, twigs, and wood fibers. Organic odor. Sample also contains little fine sand.

SECTION 31 05 13 SOILS FOR EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:
   1. Provide, place and compact borrow and bedding material in authorized excavation(s) below normal depth and in other location(s) as shown on the Drawings and/or as specified herein.

B. Related Work Specified Elsewhere:
   1. Trench Excavation - Earth, Trench Excavation - Ledge, Trench Backfilling, Compaction, Control and Testing are specified in the appropriate sections in this division.

PART 2 - PRODUCTS

2.1 MATERIALS

All materials shall be applicable as specified in owner's geotechnical report. Utilize materials specified in the geotechnical report in all applicable locations. Materials otherwise not specified in owner's geotechnical report shall conform to the following minimum standards:

A. Gravel Borrow:
   1. Well graded granular material having no rocks with a maximum dimension over 6", except where it is used for pipe bedding in which case the maximum size shall be 2".
   2. Free from frozen material and other unsuitable material.
   3. That portion passing a three inch square mesh sieve shall contain no more than 70 percent passing a l/4" mesh sieve and not more than l0 percent passing a number 200 mesh sieve when used as pipe bedding material and not more than five percent passing a number 200 mesh sieve when used as backfill around structures.

B. Screened Stone (Bedding Material):
   1. Shall be either screened stone or crushed stone and shall be well graded in size from 1/4" to 3/4".
   2. Clean, hard, and durable particles or fragments.
   3. Free from dirt, vegetable, or other objectionable matter, and excess of soft, thin elongated, laminated or disintegrated pieces.
   4. Sieve Analysis:

Sieve Designation	% Passing by Weight Square Opening
1"	100
3/4"	90-100
3/8"	20-50
No. 4	0-10
No. 8	0-5

C. Sand:
1. Clean, hard and durable particles or fragments.
2. Sieve Analysis:

Sieve Designation	% Passing by Weight Square Opening
3/8"	100
No. 4	95-100
No. 16	50-85
No. 50	10-30
No. 100	2-10

D. Underdrain Backfill Material:
1. Free from organic matter.
2. Gradations:

Type “B” Underdrain:

Sieve Designation	% Passing by Weight Square Mesh Sieves
1”	95-100
1/2”	75-100
No. 4	50-100
No. 20	15-80
No. 50	0-15
No. 100	0-10

Type "C" Underdrain:

Sieve Designation	% by Weight Passing Square Mesh Sieves
1”	100
3/4”	90-100
3/8”	0-75
No. 4	0-25
No. 10	0-5

Filter Fabric Lined Trench: 3"- 6" coarse aggregate.
Filter fabric in accordance with SECTION 31 32 19.23.

3. Shall conform to AASHTO T 27

E. French Drain Stone:
   1. Hard, durable rock.
   2. Gradations:

Sieve Designation	% by Weight Passing Square Mesh Sieves
6 inch	90-100
1½ inch	0-40
No. 4	0-5

   3. Shall conform to AASHTO T 27 except that the total material sampled shall be sieved and the minimum weight of the sample will be 120 lbs.

F. 3/4"- Crushed Stone: Crushed Stone shall be a uniform material, containing angular pieces, as are those which come from a mechanical crusher. Gradation requirements shall be as follows:

Sieve Designation	% by Weight Passing Square Mesh Sieve
1"	98-100
3/4"	0-30
No. 200	0-3

G. Impervious Dam Material: As applicable, impervious dam material shall be uniform natural or selected cohesive soil with minimum of 30 percent of the material passing a No. 200 sieve. It shall not contain vegetation, masses of roots, individual roots larger than 12". long or 1/2". in diameter or other porous or organic matter.

H. Unsuitable Soil Materials: Shall be those defined in AASHTO M145, soil classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7; also, peat and other highly organic soils.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Place bedding material, initial backfill, impervious dam material and fill below pipe bedding in layers of uniform thickness as specified or shown on the Drawings. Maximum lift thickness shall be as specified or shown on the drawings, but not greater than 12".

B. Thoroughly compact each layer by means of a suitable vibrator or mechanical tamper. Conform to the requirements of the geotechnical report, but in no case shall compaction be less than 95 percent of the fill material's maximum dry density determined in accordance with ASTM D1557.

C. In excavations below normal depth or where unsuitable materials are excavated, gravel borrow shall be used unless ground water makes such usage not practical; if such is the case, then screened stone shall be used.

D. No stone 2" in diameter or larger shall be allowed within 6” of the pipe.

E. Where soft silt and clay soils are encountered the trench shall be excavated 6” below the normal bedding and backfilled with 6” of compacted sand.

F. No stone or rock greater than 12” measured at any point shall be placed in the trench backfill.

G. Bed from specified depth below pipe to top of pipe to support pipe and prevent damage. Unless otherwise specified in plan, detail, or applicable section, the following schedule gives the minimum bedding requirements for various types of pipe. Dimensions refer to distance below bottom of pipe.

D.I. Pipe	6” min. gravel borrow.
Concrete pipe	6” min. gravel borrow.
Culverts and Storm Drain Pipe	6” min. gravel borrow.
PVC or ABS Pipe	6” min. screened stone.
P.E. Pipe	6” min. screened stone.

H. Unless otherwise specified in plan, detail, or applicable section, the following schedule gives the minimum initial backfill requirements for various types of pipes.

D.I. Pipe	Gravel borrow; 6” min. over top of pipe.
Concrete Pipe	Gravel borrow; 6” min. over top of pipe.
Culverts and Storm Drain Pipe	Gravel borrow; 6” min. over top of pipe.
PVC or ABS	Screened stone; 6” min. over the top of the pipe.
P.E. Pipe	Screened stone; 6” min. over the top of the pipe.

END OF SECTION 31 05 13

SECTION 31 05 16 – AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Building perimeter construction and backfilling, pond embankment construction and site structure backfilling.

B. Fill under slabs-on-grade.

C. Consolidation and compaction.

1.2 RELATED SECTIONS

A. Section 31 23 16 - Excavation.

B. Section 03 30 00 - Cast-in-Place Concrete

1.3 REFERENCES

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

B. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 kg) Rammer and 12” (304.8 mm) Drop.

C. ASTM D922 - Test Method for Density of Soil and Soil Aggregate in Place by the Nuclear Methods. (Shallow Depth)

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

PART 2 - PRODUCTS

2.1 FILL MATERIAL (as applicable)

A. Common Borrow: MDOT 703.18: (Only for site construction - not for building construction). Place and compact materials in continuous layers not exceeding 8”of compacted depth, compacted to 95 percent of its maximum dry density, in accordance with ASTM D1557 (modified proctor density).

B. Structural Backfill: Furnish in accordance with geotechnical report or specific plan requirements. Gravel Borrow: as specified in the geotechnical report, these plans, or MDOT 703.20: Place at over excavations below slabs and footings. Place over native material after organic soils are removed to raise subgrade below slabs and footings. Utilize per Geotechnical Report, as applicable. As a minimum, construct a 12" layer in a single 12" lift or lifts, and compacted to 95 percent of its maximum dry density, in accordance with ASTM D1557 (modified proctor density). In the case of footings set higher than original grade of competent mineral soil, first compact native material, use structural backfill to establish and compact fill slopes at 1:1 slopes from the edges of footings (entire backfill areas for retaining walls).

C. Granular Backfill: Per MDOT 703.22 for utility excavations and backfilling operations.

D. Crushed Stone: Per MDOT 703.31 for utility excavations and backfilling operations, except that 100 percent shall pass the 2" sieve.

E. Detention Pond Embankment: Excavated or imported clay silt material, graded, free of lumps larger than 3", rocks larger than 2", and debris. Material shall have at least 20% fines, more than 20% by weight passing the No. 200 sieve, and shall be compacted to a minimum of 95% modified proctor density in 9"-12" maximum lifts. The contractor may utilize glacial marine soil excavated on site with the approval of the owner's representative.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify fill materials to be reused are acceptable.

B. Owner's designated representative shall observe the excavation and accept suitable borrow material for placement as pond embankment material. Sandy layers shall be excluded from use as embankment fill.

C. Verify foundation perimeter drainage installation has been inspected.

3.2 PREPARATION

A. Generally, compact subgrade to density requirements for subsequent backfill materials. The foundation and slab base soil should be placed directly on the existing proof-rolled native mineral soil. Proof rolling should consist of making three passes in a north-south direction followed by three passes in an east-west direction using a large (minimum three ton at drum static weight) vibratory roller in slab areas and narrow roller vibratory trench rollers at footings (all passes in same direction).

B. Cut out soft areas of subgrade not capable of insitu compaction. Fill and compact to density equal to or greater than requirements for subsequent backfill material.

3.3 BACKFILLING

A. Backfill and compact areas to contours and elevations with unfrozen materials.

B. Backfill and compact where footing elevations are higher than suitable native mineral soil with structural backfill below and at 1:1 slope from edge of footing (level for retaining walls). Structural fill should be placed in a maximum of 12” lifts and be compacted to 95 percent of its maximum dry density determined in accordance with ASTM D1557, Modified Proctor Density

C. Backfill and compact pond embankment areas as early as possible to allow maximum time for settlement before shaping overflow structures.

D. Systematically backfill and compact to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces. Work shall be scheduled so that the pond embankment shall be constructed three months prior to final setting of elevation sensitive components, such as the emergency spillway, allowing maximum time for settlement to occur.

E. Place and compact materials in continuous layers not exceeding 6” compacted depth. Pond Embankment requirements: Pond embankment sections shall be constructed from 8” to 12” lifts. At each lift, a bulldozer or similar equipment shall mechanically break down clods of clay-silt material as each lift is shaped. The owner’s representative shall verify that no sand layers remain in each lift. Unsuitable material shall be replaced. Each lift shall be compacted with a sheepsfoot roller to 90 percent modified proctor density. Water shall be added as may be required to reach compaction.

F. Employ a placement method that does not disturb or damage foundation perimeter drainage, foundation damp proofing, and utilities in trenches.

G. Maintain optimum moisture content of backfill materials to attain required compaction density.

H. Make changes gradual. Blend slope into level areas.

I. Remove surplus backfill materials from site.

3.4 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with ANSI/ASTM D1556, ANSI/ASTM D1557, and ANSI/ASTM D698.

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

3.5 PROTECTION OF FINISHED WORK

A. Recompact fills subjected to vehicular traffic. Place and compact additional material of like kind and to equal compaction to re-establish suitable finished or subgrade.

END OF SECTION 31 05 16

SECTION 31 23 16 - EXCAVATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Perform the following items of work, as shown on the Drawings and specified herein:
   1. Excavate and furnish all material necessary to establish suitable finished grades for subgrade preparation, cut slope or embankment construction, as required to complete the work of this Contract, including the furnishing and compaction of additional material as needed.
   2. Completely remove from the site all excavated material which is not approved by the Engineer for use as embankment material. This provision does not apply to topsoil which will remain the property of the Owner.
   3. Establish subgrades as indicated on the Drawings and specified hereunder.
   4. Perform cutting and removal of existing pavements to the extent indicated on the Drawings and as required for the work under this Contract.
   5. Protect all trees, shrubs and plantings not designated on the Drawings to be removed, for the duration of the Contract.
   6. Protect all utilities on the site for the duration of the work.

B. Related Work Specified Elsewhere:
   1. Quality Control

1.2 DEFINITIONS

A. The work involved includes removal, haul and disposal of materials to prepare for construction and the placing and compaction of material to construct embankments.

B. Excavation shall be designated as common, rock, unclassified or muck.

   1. Common excavation shall consist of removal of earth, of boulders, solid mortared stone masonry and concrete masonry when each is less than two cubic yard in volume and of rock which can be removed with ordinary excavating machinery. Grubbing shall be considered as common excavation.
   2. Rock excavation shall consist of removal of solid rock which cannot be excavated without the use of explosives or ripping equipment and of boulders, solid mortared stone masonry and concrete masonry having a volume of two cubic yard or more.
   3. Unclassified excavation shall consist of removal of materials without consideration to their composition.

4. Muck excavation shall consist of excavation of soils and organic materials which are not suitable for use in embankment.

C. Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; site grading around buildings and structures; the construction of parking areas, lawns, berms, and dikes; the placing and compacting of approved material within areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits and other depressions within the roadway area or construction site limits.

D. Related Work Specified Elsewhere (When Applicable):
1. Stripping and Stockpiling of Topsoil; Trench Excavation-Earth; Trench Excavation-Ledge; Borrow and Bedding Material; Trench Backfilling, Compaction, Control and Testing; Temporary Erosion Control and Dewatering are specified elsewhere in this division.

1.3 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:
1. All work shall be performed and completed in accordance with all local, state or federal regulations.
2. The General Contractor shall secure all necessary permits from, and furnish proof of acceptance by, the local and state departments having jurisdiction and shall pay for all such permits, except as specifically stated elsewhere in the Contract Documents.

B. Grade and Elevations:
1. The Contractor shall establish the lines and grades in conformity with the Drawings and maintain same to properly perform the contract installation.

C. Compaction:
1. The Contractor shall compact all embankment materials in accordance with this specification.
2. Density testing shall be performed by an Independent Testing Laboratory retained by the Owner and acceptable to the Engineer and Contractor.
3. Independent Testing Laboratory shall determine in place densities in accordance with ASTM D1556 or other methods approved by the Engineer.
4. Independent Testing Laboratory shall submit one (1) copy of the following reports to each of the following: Engineer, Resident Project Representative, Contractor;
   a. Test reports on material
   b. Field density test reports
   c. One moisture density curve for each type of soil encountered
5. Location of Tests: (OWNER WILL HANDLE ALL TESTING)

a. One test per 300 feet of completed roadway subgrade just prior to placement of subbase gravels and additional tests at depths as required by the Engineer.
b. Two tests on finished subgrade in parking area just prior to placing the subbase gravels and additional tests at depths as required by the Engineer.

6. If the test results fail to meet the requirements of these specifications, the Contractor shall correct the situation and obtain a passing test. The cost of reworking the material to obtain a passing test shall be borne by the Contractor and no allowance will be made for delays in the performance of the work. All testing and retesting shall be conducted by the Independent Testing laboratory. Costs of retesting will be paid by Owner. The cost of retesting will be determined by Engineer and Owner will invoice Contractor for this cost. If unpaid after 60 days, the invoice amount will be deducted from the Contract Price.

1.4 JOB CONDITIONS

A. Disposition of Utilities:
1. The locations of utilities shown on the plans are approximate as determined from physical evidence on or above the surface of the ground and from information supplied by the utilities. The Engineer in no way warranties that these locations are correct. It shall be the responsibility of the Contractor to determine the actual locations of any utilities within the project area.
2. Rules and regulations governing the respective utilities shall be observed in executing all work in this section. Active utilities shall be adequately protected from damage, and removed or relocated only as indicated or specified. Inactive and abandoned utilities encountered in excavation and grading operations shall be removed, plugged or capped. Report in writing to the Engineer, the locations of such abandoned utilities. Extreme care shall be taken when performing work in the vicinity of existing utility lines, utilizing hand excavation in such areas, as far as practicable. . If, in the progress of excavation, any utility should become damaged and result in any damage to public or private property, the General Contractor shall restore to the original condition, at no additional cost to the Owner, anything which has been damaged or disturbed.

PART 2 – PRODUCTS

2.1 DEFINITIONS OF GRAVEL, SAND, AND SILT CLAY

A. The terms "gravel", "coarse sand," "fine sand" and "silt-clay," as determinable from the minimum test data required in this classification arrangement and as used in subsequent word descriptions, are defined as follows:
1. Gravel - Material passing sieve with 75 mm (3-inch) square openings and retained on the 2.00 mm (No. 10) sieve.
2. Coarse Sand - Material passing the 2.00 mm (No. 10) sieve and retained on the 0.425 mm (No. 40) sieve.

3. Fine Sand - Material passing the 0.425 mm (No. 40) sieve and retained on the 0.075 mm (No. 200) sieve.
4. Silt-Clay (Combined silt and clay) - Material passing the 0.075 mm (No. 200) sieve.
5. Boulders (retained on 77 mm (3-inch) sieve) should be excluded from the portion of the sample to which the classification is applied, but the percentage of such material, if any, in the sample should be recorded.
6. The term "silty" is applied to fine material having plasticity index of 10 or less and the term "clayey" is applied to fine material having plasticity index of 11 or greater.

2.2 SOIL MATERIALS

A. Use of Excavated Material:
   1. To the extent they are needed, all suitable materials from the specified excavation may be used in the construction of required embankment and slope protective devices (riprap).
   2. Surplus excavated materials suitable for filling operations shall be stockpiled for future use as directed by the Owner's. This specific location will be determined at the start of construction.
   3. Unsuitable material shall consist of grubbings or other materials which contain rock of size exceeding specifications, organic materials, or other materials of a deleterious nature as deemed by the Engineer. Silts, clays and granular materials with more than 8% passing the number 200 sieve shall be considered unsuitable for embankment in the Frost Penetration Zone under paved areas when sufficient water supply is available to cause heaving.

B. Common borrow shall consist of approved material required for the construction of embankments or for other portions of the work as designated and shall be obtained from a source off-site, except as otherwise noted. Common borrow shall be free from frozen material, clay, perishable rubbish, peat, organic and other deleterious materials.

C. Gravel borrow shall be free of rocks with a maximum dimension over six inches, frozen material and other unsuitable material. That portion passing a three-inch square mesh sieve shall contain no more than 70% passing a 1/4 inch mesh sieve and not more than 10% passing a number 200 mesh sieve.

D. Rock fill shall consist of rock for use in embankments which consists of hard durable particles broken to various sizes that will form a compact embankment with a minimum of voids. It shall contain no particles or fragments with a maximum dimension in excess of the compacted thickness of the layer being placed.

E. Embankment material shall consist of suitable approved common excavation and/or common, or gravel borrow. Rock excavation may be used as embankment material if it is thoroughly mixed with common excavation and/or common borrow to eliminate voids.

F. Crushed stone shall consist of clean, angular rock with a blended size range of 3/8” to 1 1/2”.

PART 3 - EXECUTION

3.1 SAFETY

A. Comply with applicable local, state or federal safety regulations or in the absence thereof, with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc.

B. Provide shoring, sheeting and/or bracing at excavations as required to prevent cave-ins of excavation, and to assure complete safety of existing structures, utilities and pavements that are to remain in place.

C. Remove sheeting and shoring and bracing, as backfilling operations progress, taking all necessary precautions to prevent failure of excavation sides. Where sheeting is to be left in place, it shall not be within 2 feet of subgrade.

3.2 COMMON EXCAVATION

A. The Contractor shall excavate material encountered to establish required grade elevations.
   1. Unauthorized Excavation:
      a. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at the Contractor's expense.
      b. The Contractor shall backfill and compact unauthorized excavations as specified for authorized excavations of the same classification, unless otherwise directed by the Engineer.
   2. Additional Excavation:
      a. When excavation has reached required subgrade elevations, notify the Engineer who will make an inspection of conditions.
      b. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and replace the excavated material as directed by the Engineer.
      c. Removal of unsuitable material and its replacement as directed will be paid on the basis of contract conditions relative to changes in work.

B. Common excavation areas shall be maintained in such condition that the excavation will be well drained.

C. Roadway excavation, in general, shall proceed in a direction upgrade. Subgrades shall be promptly rolled to prevent absorption of water.

3.3 EXCAVATION FOR UTILITY SERVICES

A. Water, telephone, data, fire alarm, storm drainage, electric services, utility structures, sanitary sewer piping, manholes, and catch basins will be installed under the work of the respective Sections.

3.4 MINIMUM LIMITS FOR EARTH EXCAVATION

A. Earth excavation must be carried to the following limits, unless otherwise indicated herein or on the drawings or authorized by the Engineer
   1. Subgrades for site work shall be as follows:
      a. Areas to receive topsoil - Four (4) inches below finish grades.
      b. Utility structures - Bottom of structure or as shown on the site details and eighteen (18) inches outside wall extremities.
      c. On-site bituminous concrete paved surfaces, as noted on the Drawings.
      d. Off-site paved areas, as noted on the Drawings.
      e. Unspecified site improvements - To bottom elevation of item plus ample working space on all sides.
   2. In non-specified areas - To the lines indicated on the Drawings plus proper side clearance for construction.

3.5 ROCK EXCAVATION

A. In open excavations material will be classified as rock only when the following conditions prevail:
   1. When the natural compound, natural mixture, and/or chemical element cannot be broken and removed from its existing position and state by a 3/4-yard backhoe or D8 dozer and requires the use of drills, or the use of explosives.
   2. Boulders or old concrete foundations in excess of 2 cubic yards.
   3. Anything other is "earth" insofar as removal of the material to be excavated is concerned.
   4. NOTE: When during the process of excavation, rock is encountered such material shall be uncovered and exposed, and the Engineer shall be notified by the Contractor, before proceeding further. The areas in question shall then be measured as stipulated in paragraph B, following. The Contractor shall not proceed with excavation of material claimed as rock until the material has been classified by the Engineer. Should the Contractor proceed with the excavation without notifying the Engineer, or prior to the survey, he shall forfeit his right to extra payment in the subject area.

B. The Contractor will provide qualified personnel, acceptable to both the Owner and the Engineer, to take cross-sections of rock before removal of same, and to provide computations of cross-sections within the payline limits.

C. Excavate rock, encountered in grading areas within the contract, to depths as follows:
   1. Under pavements and surfaced areas - To six inches below the required subgrade for such areas.
   2. Under lawn areas - to two feet below finished grade, unless approved otherwise by the Engineer.

D. Blasting - Obtain written permission and approval of method from the local authorities before proceeding with rock excavation. Explosives shall be stored, handled, and employed in accordance with the provisions of the "Manual of Accident Prevention in Construction: of the Associated General Contractors of America, Inc.

3.6 COLD WEATHER PROTECTION

A. Protect excavations against freezing when atmospheric temperature is less than 35 degrees F.

3.7 COMPACTION

A. General: Control soil compaction during construction to the satisfaction of the Engineer and/or Resident Project Representative by providing compaction to at least the minimum percentage of maximum density as specified for each area classification.

B. Conform to the recommendations of the Owner's geotechnical report.

C. Percentage of Maximum Density Requirements: Unless otherwise specified, compact soil to not less than the following percentages of maximum dry density for soils which exhibit a well-defined moisture density relationship (determined in accordance with ASTM D1557) and to not less than the following percentages of relative dry density (determined in accordance with ASTM D2049) for soils which do not exhibit a well- defined moisture density relationship.
   1. Lawn or Vegetated Areas: Compact top 6 inches of subgrade and each layer of backfill or fill material to 90 percent maximum dry density as determined by AASHTO T-180, Method C or D.
   2. Pavements: Compact top 12 inches of excavation subgrade and each layer of fill material to 95 percent maximum dry density as determined by AASHTO T-180, Method C or D.

D. Moisture Control: Where subgrade or a layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material at a rate such that free water does not appear on surface during or subsequent to compaction operations.

E. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

F. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry.

3.8 EMBANKMENT

A. Compaction Equipment
   1. Provide sufficient equipment units of suitable types to spread, level and compact fills promptly upon delivery of materials.
   2. The Contractor may use any compaction equipment or device which he finds convenient or economical, but the Engineer retains the right to disapprove equipment which, in his opinion, is of inadequate capacity or unsuited to character of material being compacted.
   3. The Contractor shall be responsible for the proper placement and compaction of backfill material. Any settlement that occurs shall be repaired by the Contractor at his own cost and expense. If pipeline and/or structures are damaged or displaced, they shall be repaired at the Contractor's expense.

B. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water.

C. Notify the Engineer when excavations are ready for inspection. Filling and backfilling shall not be started until conditions have been approved by the Engineer.

D. Place acceptable soil materials in layers to required subgrade elevations, for each area classification listed below.

1. In excavations, use satisfactory excavated or borrow material.
2. Under grassed areas, use satisfactory excavated or borrow material.
3. Under pavements, use satisfactory excavated or borrow material or combination of both.

E. Grub areas a depth of 12" where fills are to be less than five feet in depth as shown on the Drawings.

F. When existing ground surface has a density less than that specified under "Compaction" for the particular area classification, break up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to required depth and percentage of maximum density.

G. Placement and Compaction: Place fill materials in layers no thicker than 10 inches.

H. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification.

I. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

J. Place backfill and fill materials evenly to required elevations adjacent to structures. Take care to prevent wedging action of fill against structures by carrying the material uniformly around structure to approximately the same elevation in each lift.

K. When water and sewer piping is laid in filled areas, place the fill before any pipe is placed, and compact as specified to a depth or not more than two feet above the proposed top of the pipe. A trench shall then be excavated to the required grade, and of sufficient width to permit thorough tamping of the fill under the bells and around the pipe.

L. At the end of each day's work the embankment shall be shaped and rolled to minimize infiltration of water.

3.9 GRADING

A. General: Uniformly grade areas within limits of construction. Smooth finished surface within specified tolerances.
1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 feet above or below the required subgrade elevations.
2. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/2 inch above or below the required subgrade elevation.

3.10 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades to specified tolerances in settled, eroded or rutted areas.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, reshape, and compact to required density prior to further construction.

3.11 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Removal from Owner's Property: Remove waste materials, including unacceptable excavated material, trash and debris, and dispose of it off the Owner's property. This provision does not apply to stockpiled topsoil which shall remain on site unless written authorization for its removal is provided by the Engineer.

END OF SECTION 33 42 13

SECTION 31 23 16.13 - TRENCHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:
1. Trench excavation work in earth includes the removal of sand, gravel, existing sewers and manholes, ashes, loam, clay, swamp muck, trolley tracks, soft or disintegrated rock or hard pan existing sewers and manholes which can be removed with a backhoe, or a combination of such materials, and boulders measuring less than one cubic yard for the installation of pipes and appurtenant structures.
2. All trench excavation shall be classed as earth or ledge.

B. Related Work - Specified Elsewhere:
1. Traffic regulation and pedestrian protection is specified in the appropriate division.
2. Clearing, removal and replacement of paving, trench excavation ledge, borrow and bedding, material, manholes, and catch basins, trench backfilling, compaction, control and testing, when applicable, are specified in the appropriate sections in this division.
3. Pipe and pipe fittings, valves, gates, and hydrants, when applicable, are specified the applicable sections.

1.2 JOB CONDITIONS

A. Utilities:
l. The locations of utilities shown on the plans are approximate as determined from physical evidence on or above the surface of the ground and from information supplied by the utilities. The Engineer in no way warranties that these locations are correct. It shall be the responsibility of the Contractor to determine the actual locations of any utilities within the project area.
2. Rules and regulations governing the respective utilities shall be observed in executing all work in this section. Active utilities shall be adequately protected from damage, and removed or relocated only as indicated or specified. Inactive and abandoned utilities encountered in excavation and grading operations shall be removed, plugged or capped only with written authorization from the Utility Company. Report in writing to the Engineer, the locations of such abandoned utilities. Extreme care shall be taken when performing work in the vicinity of existing utility lines, utilizing hand excavation in such areas, as far as practicable. If, in the progress of excavation, any utility should become damaged and result in any damage to public or private property, the General Contractor shall restore to

the original condition, at no additional cost to the Owner, anything which has been damaged or disturbed.

B. Existing Structures:
   l. Perform excavation in such a manner that will prevent any possibility of undermining and disturbing the foundations of any existing structures and any work previously completed under this Contract.
   2. Where existing buildings and other structures are in proximity to the proposed construction, exercise extreme caution and utilize sheeting, bracing, and whatever other precautionary measures, that may be required.

C. Repairing Damage:
   1. Repair, or have repaired, all damage to existing utilities, structures, lawns, other public and private property which results from construction operations, at no additional expense to the Owner, to the complete satisfaction of the Engineer, the utility company, the property owners and the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. The Contractor shall not have any right of property in any suitable materials taken from any excavation. Do not remove any such materials from the construction site without the approval of the Engineer. This provision shall in no way relieve the Contractor of his obligations to remove and dispose of any material determined by the Engineer to be unsuitable for backfilling.

B. Unsuitable Material:
   1. If, in the opinion of the Engineer, the material encountered above the indicated grade, shown on the Drawings, for excavation is unsuitable material, remove the material to the widths and depths as directed by the Engineer. Replace this material as specified in the "Trench Backfilling, Compaction, Control and Testing" section of this division.
   2. If, in the opinion of the Engineer, the material encountered at or below the grade shown on the Drawings for excavation is unstable material, remove the material to the full width of the trench and to a minimum depth of twelve inches below the pipe. Replace this material with thoroughly compacted suitably screened gravel bedding material.
   3. All excavated materials designated by the Engineer as unsuitable shall become the property of the Contractor and disposed of at locations acceptable to or designated by the Owner, at no additional cost to the Owner.

C. Embankment Material:

1. Obtain prior approval and instructions from the Engineer prior to undertaking the excavation for pipe placement of any fill material that has been in an embankment less than one year.

PART 3 - EXECUTION

3.1 PERFORMANCE

A. General:
1. Unless otherwise specifically directed or permitted by the Engineer, begin excavation at the low end of sewer and storm lines and proceed upgrade.
2. Perform excavation for force mains and water mains in a logical sequence.

B. Amount of Excavation:
1. Trench width: As shown on the Drawings.
2. Trench depth: As shown on the Drawings.
3. Open Excavation:
   a. The extent of open excavation shall be controlled by prevailing conditions.
   b. Open excavation shall, at all times, be confined to the limits prescribed by the Engineer.
   c. No trenches shall be left open during non-working hours unless adequate provisions are made to prevent injury to the work or persons. Appropriate barricades and warning devices shall be used to alert the public of hazardous areas.
4. Unauthorized Excavation:
   a. Backfill to the specified grade, any excavation beyond the limits stated above and as shown on the Drawings (unless specifically ordered by the Engineer) with thoroughly compacted gravel borrow or screened gravel.
   b. Backfilling unauthorized excavation shall be at no additional cost to the Owner.

C. Shoring and Bracing:
1. As the excavation progresses, install such shoring and bracing necessary to prevent caving and sliding and to meet the requirements of the state and OSHA safety standards.

END OF SECTION 31 23 16.13

SECTION 31 25 13 - EROSION CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION

A. Work Included:
1. The work under this section shall include provision of all labor, equipment, materials and maintenance of temporary erosion control devices as specified herein, as shown on the Drawings and as directed by the Engineer.
2. Erosion control measures shall be provided as necessary to correct conditions that develop prior to the completion of permanent erosion control devices or as required to control erosion that occurs during normal construction operations.
3. Construction operations shall comply with all federal, state and local regulations pertaining to erosion control.
4. After award of the Contract, prior to commencement of construction activities, meet with the Engineer to discuss erosion control requirements and develop a mutual understanding relative to details of erosion control.

B. Related Work Specified Elsewhere:
1. Site work is specified in appropriate sections of this Division.
2. Provisions stipulated in Environmental Protection.

C. Design Criteria:
1. Conduct all construction in a manner and sequence that causes the least practical disturbance of the physical environment. Protect existing vegetation designated to remain.
2. Stabilize disturbed earth surfaces in the shortest time and employ such temporary erosion control devices as may be necessary until such time as adequate soil stabilization has been achieved.

1.2 SUBMITTALS

A. The Contractor shall furnish the Engineer, in writing, his work plan giving proposed locations for storage of topsoil and excavated material before beginning construction. A schedule of work shall accompany the work plan. Acceptance of this plan will not relieve the Contractor of the responsibility of completion of the work as specified.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Baled Hay:

1. At least 14" by 18" by 30" securely tied to form a firm bale, staked as necessary.

B. Sand Bags:
   1. Heavy cloth bags of approximately one cubic foot capacity filled with sand or gravel.

C. Mulches:
   1. Loose hay, straw, peat moss, wood chips, bark mulch, crushed stone, wood excelsior, or wood fiber cellulose. Provide specified item by type and use as and where specified.
   2. Type and use shall be as specified by the "Maine Erosion and Sedimentation Control Handbook for Construction - Best Management Practices" prepared by the Maine DEP and the Soil and Water Conservation Commission herein after referred to as the BMP.

D. Mats and Nettings:
   1. Twisted Craft paper, yarn, jute, excelsior wood fiber mats, glass fiber and plastic film.
   2. Type and use shall be as specified on the plan and consistent with the BMP manual.

E. Permanent Seed:
   1. Conservation mix appropriate to the predominant soil conditions as specified in the BMP and subject to approval by the Engineer.

F. Temporary Seeding:
   1. Use species appropriate for soil conditions and season as specified in the BMP and subject to approval by the Engineer.

H. Water:
   1. The Contractor shall provide water and equipment to control dust, as directed by the Engineer.

I. Filter Fabrics:
   1. Filter fabric shall be of one of the commercially available brands such as Mirafi, Typar or equivalent. Fabric types for particular applications shall be approved by the Engineer prior to installation.

J. Silt Fence:
   1. Consistent with BMPs.

K. Bark Mulch Berm:
   1. Consistent with BMPs.

L. Stone Check Dam:
   1. Consistent with BMPs.

2.2 CONSTRUCTION REQUIREMENTS

A. Temporary Erosion Checks:
   1. Temporary erosion checks shall be constructed in ditches and other locations as necessary. Stones shall be used for check dams as specified.
   2. Baled hay or sediment barrier may be used to fit local conditions.

B. Temporary Berms:
   1. Temporary barriers shall be constructed along the toe of embankments when necessary to prevent erosion and sedimentation.

C. Temporary Seeding:
   1. Areas to remain exposed for a time exceeding 3 weeks shall receive temporary seeding as indicated below:

Season	**Seed**	**Rate**
Summer (5/15 - 8/15)	Sudangrass	40 lbs/acre
Late Summer/Early Fall	Oats	80 lbs/acre
(8/15 - 9/15)	Annual Ryegrass	40 lbs/acre
Fall (9/15 - 10/1)	Winter Rye	112 lbs/acre
Winter (10/1 - 4/1)	Mulch w/Dormant Seed	80 lbs/acre*
Spring (4/1 - 7/1)	Oats	80 lbs/acre
Annual Ryegrass	40 lbs/acre	
* seed rate only		

D. Construct silt fence in accordance with details provided prior to soil disturbance.

E. Mulch All Areas Receiving Seeding: Use either wood cellulose fiber mulch (750 lbs/acre); or straw mulch with chemical tack (as per manufacturers' specifications). Wetting for small areas may be permitted. Biodegradable netting is recommended in areas to be exposed to drainage flow.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Temporary Erosion Checks:
   1. Temporary erosion checks shall be constructed in ditches and at other locations designated by the Engineer. The Engineer may modify the Contractor's arrangement of silt fences, bales and bags to fit local conditions.
   2. Baled hay, silt fences, or sandbags, or some combination, may be used in other areas as necessary to inhibit soil erosion.
   3. Siltation fence, if called for in the plans, shall be located and installed as shown.

4. Sedimentation ponds shall be sited and constructed to the grades and dimensions as shown on the Drawings and will include drainage pipe and an emergency spillway.

B. Maintenance: Erosion control features shall be installed prior to excavation wherever appropriate. Temporary erosion control features shall remain in place and shall be maintained until a satisfactory growth of grass is established. The Contractor shall be responsible for maintaining erosion control features throughout the life of the construction contract. Maintenance will include periodic inspections by the Owner or Engineer for effectiveness of location, installation and condition with corrective action taken by the Contractor as appropriate.

C. Removing and Disposing of Materials:
   1. When no longer needed, material and devices for temporary erosion control shall be removed and disposed of as approved by the Engineer.
   2. When removed, such devices may be reused in other locations provided they are in good condition and suitable to perform the erosion control for which they are intended.

END OF SECTION 31 25 13

SECTION 31 32 19.23 - GEOTEXTILE LAYER SEPARATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included:

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

B. Related Work Specified Elsewhere:

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

1.2 QUALITY ASSURANCE

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

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

1.3 SUBMITTALS

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

Table 1 - Geotextile Minimum

Mechanical Property	Test Method	Permissible Value
Grab Tensile Strength (both directions)	ASTM D4632	120 pounds
Grab Elongation	ASTM D4632-86	50 percent
CBR Puncture Strength	ASTM D6241	310 pounds
Trapezoid Tear Strength	ASTM D4533-85	60 pounds
Water Flow Rate	ASTM D4491-85	135 gal/min/sf
Equivalent Opening Size	ASTM D4751	80 (EOS)
Coefficient of Permeability	ASTM D4491-85	0.2 cm/sec
UV Resistance	ASTM D4355	70% Strength Retained

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

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

Table 2 - Geotextile Minimum

Mechanical Property	Test Method	Permissible Value
Grab Tensile Strength (both directions)	ASTM D4632	200 pounds
Grab Elongation	ASTM D4632-86	15 percent
CBR Puncture Strength	ASTM D3787	700 pounds
Trapezoid Tear Strength	ASTM D6431	75 pounds
UV Resistance	ASTM D4355	70% Strength Retained
Equivalent Opening Size	ASTM D4751	between #20 and #100 (EOS) U.S. Std. Sieve number(s)

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

PART 3 - EXECUTION

3.1 INSTALLATION

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

END OF SECTION 31 32 19.23

SECTION 32 11 23 - AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 DESCRIPTION

A. The aggregate base and subbase courses for use below pavement shall be composed of layers of aggregate of different gradations.

B. Related Work Specified Elsewhere: (When Applicable):
   1. Excavation and Embankment, Bituminous Concrete Paving.

1.2 SUBMITTALS

A. Contractor shall certify that materials comply with the specification requirements by submitting either laboratory test results or certificates of compliance.

1.3 QUALITY ASSURANCE

A. Compact aggregate base and subbase course materials to a density of at least 95 percent of the maximum density as determined in accordance with ASTM D-1557, Method D.

B. Work shall be halted when the Engineer or Resident Project Representative is not satisfied with the apparent results of the Contractor's compaction operation. A testing laboratory acceptable to the Engineer shall then be obtained by the Owner to determine, by conducting density tests, if the Contractor is complying with these compaction specifications.
   1. If the test results fail to meet the requirements of these Specifications, the Contractor shall undertake whatever action is necessary, to obtain the required compaction. The cost of the testing service will be borne by the Contractor and no allowance will be considered for delays in the performance of the work.
   2. If the test results pass and meet the requirements of these Specifications, the direct invoice cost of the testing service will be borne by the Owner, but no allowance will be considered for delays in the performance of the work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate subbase course shall be gravel consisting of hard, durable particles which are free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the portion which will pass a three inch sieve shall meet the grading requirements of the following tables:

Table 1 - Gradation Requirements - Aggregate Subbase Course:

Furnish only when specified

Sieve Designation	Percent by Weight Passing Square Mesh Sieve			
	Type D	Type E	Type F	Type G
1/4”	25-70	25-100	60-100	--
No. 40	0-50	0-30	0-50	0-70
No. 200	0-7	0-7	0-7	0-10

B. Aggregate for base shall be screened or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3” sieve shall meet the grading requirements of the following table:

Table 2 - Gradation Requirement - Aggregate Base Course

Sieve Designation	Percent by Weight Passing Square Mesh Sieves		
	Type A (Crushed) Aggregate	Type B (Screened) Aggregate	Type C (Bank Run) Aggregate
1/2”	45-70	35-75	----
1/4”	30-55	25-60	25-70
No. 40	0-20	0-25	0-30
No. 200	0-5	0-5	0-5

C. Gradation tests shall conform to AASHTO Method T-27, except that the material may be separated on the 1/2” sieve. The subbase shall not contain particles of rock which will not pass the six inch square mesh sieve. Type A aggregate for base shall not contain particles of rock which will not pass the 2” square mesh. Type B aggregate for base shall not contain particles of rock which will not pass the 4” sieve. Type C aggregate for base shall not contain particles of rock which will not pass the 6” square mesh sieve.

PART 3 - EXECUTION

3.1 PLACING

A. The subbase course may be constructed full depth in two lifts provided compaction is achieved. Fine grading the lower layer will not be required.

B. Aggregate base course shall be placed full depth in one lift.

3.2 SHAPING AND COMPACTING

A. All layers of aggregate subbase course shall be compacted to the required density immediately after placing. As soon as the compaction of any layer has been completed, the next layer shall be placed.

B. The Contractor shall bear full responsibility for and make all necessary repairs to the base and subbase courses and the subgrade until the full depth of the base and subbase courses is placed and compacted. Repairs shall be considered incidental to other contract items and shall be made at no cost to the Owner.

C. If the top of any layer of the aggregate base or subbase course becomes contaminated by degradation of the aggregate or addition of foreign materials, the contaminated material shall be removed and replaced with the specified material at the Contractor's expense.

D. The top of any aggregate subbase course layer shall be scarified and loosened for a minimum depth of one inch immediately prior to the placing of the next layer of aggregate base course. This scarifying shall be considered incidental to placing the course, and no separate payment will be made.

3.3 SURFACE TOLERANCE

A. The completed surface of the aggregate base and subbase courses shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of 3/8” for aggregate base course and 1/2” for aggregate subbase.

END OF SECTION 32 11 23

SECTION 323223
SEGMENTAL RETAINING WALLS

PART 1 - GENERAL

1.00 RELATED DOCUMENTS

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

1.01 DESCRIPTION

A. Provide a segmental retaining wall system, as indicated on the Drawings and as specified herein.

B. Segmental retaining wall system shall include the following:

1. Design and engineering of the system for the locations indicated;

2. Furnishing and installing the segmental gravity retaining walls with soil reinforcement as indicated.

1.02 RELATED SECTIONS

A. Sections which directly relate to the work of this Section include:

1. Section 312500 - EROSION AND SEDIMENTATION CONTROLS.

2. Section 310000 - EARTHWORK.

3. Section 033055 - CAST-IN-PLACE CONCRETE (SITE).

1.03 SUBMITTALS

A. Manufacturer’s Design: Submit manufacturer’s design of retaining wall complete with plans, calculations, and material specifications. Calculations shall be stamped and sealed by a registered professional engineer licensed in the jurisdiction of the Project.

B. Manufacturer’s Product Data: Submit manufacturer’s product data for system including segmental blocks, reinforcing, anchorage devices, capstone units, and adhesives, and all other pertinent products used as part of the retaining wall system.

C. Samples: Submit duplicate samples of block units demonstrating full range of color and texture of block units.

1.04 QUALITY ASSURANCE

A. System Design: Design of retaining wall system shall be performed by a licensed professional engineer with a structural specialty and a licensed professional geotechnical engineer, both of whom shall be licensed in the state where the project is located. Design of system shall be provided by the manufacturer as part of the scope of this Contract. System design shall conform to applicable local codes and standards and shall be fully supported by test data, calculations, drawings and details.

B. Installer Qualifications: Engage an experienced installer who has completed segmental retaining wall installations similar in material, design, and extent to that indicated for this Project. Installer shall be acceptable to the manufacturer and shall provide as part of their qualifications a successful record of in-service performance for comparable retaining wall installations.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated without delaying the Work, as documented according to ASTM E548.

D. Mockups: Before installing segmental retaining walls, construct sample wall panels to verify selections made under submittals and to demonstrate the aesthetic effects and qualities of materials and workmanship. Build mockups to comply with the following requirements, using materials indicated for completed Work.

1. Locate mockups in the locations indicated or, if not indicated, as directed by Owner’s Representative.

2. Build mockups for each type of segmental retaining wall in sizes approximately 72 inches (1800 mm) long by 36 inches (900 mm) high above finished grade at front of wall.

    a. Include typical base and cap or finished top construction.
    b. Include backfill to typical finished grades at both sides of wall.
    c. Include typical end construction at one end of mockup.
    d. Include 36-inch (900-mm) return at one end of mockup with typical corner construction.

4. Notify Owner's Representative at least seven (7) days in advance of the dates and times when mockups will be constructed.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

    a. Approval of mockups does not constitute approval of deviations from Contract Documents contained in mockups, unless such deviations are specifically approved in writing.
    b. When directed, demolish and remove mockups from Project site.
    c. Where approved by the Engineer, approved mockups in an undisturbed condition at the time of Substantial Completion may become part of the completed Work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project Site in an undamaged condition.

B. Store and handle retaining wall units and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, or other causes.

C. Store accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

D. Store and handle geotextiles according to ASTM D 4873.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equal:

1. Retaining Wall Units:

    a. Licensees of Shea Concrete Products
    b. Licensees of Keystone Retaining Wall Systems, Inc.
    c. Licensees of Kiltie Corp.; Versa-Lok Retaining Wall Systems Division.
    d. Licensees of Reinforced Earth Co. (The).

2. Geotextile Fabrics:

    a. Mirafi, or approved equal.

2.02 RETAINING WALL UNITS

A. Concrete Units: High-strength, regular-weight concrete units, designed for use in segmental retaining walls, complying with ASTM C90, except with net-area compressive strength of 3,000 psi (20.7 MPa) for average of three units and 2,500 psi (17.2 MPa) for individual units, and with maximum water absorption of 8 percent, and variation in height limited to 1/16 inch (1.6 mm).

1. Provide units with lugs, projections, or holes and pins that locate successive courses in relation to the course below and which maintains that alignment as backfill is placed, and that interlock with units above and below.

2. Provide units with lugs, projections, holes and pins, or hollow cores for filling with drainage fill to interlock with units above and below.

B. Colors: Provide units that result in colors of exposed wall surfaces complying with the following requirements:

1. Match submittal samples.

2. Match colors indicated by referencing manufacturer's standard designations for colors.

3. Provide selections from manufacturer's full range of colors for materials and products of type indicated. Color will be selected by the Owner or Engineer.

C. Surface Texture: Provide units with machine-split faces and smooth, as-cast beds.

D. Shapes: Provide units matching basic shapes and dimensions indicated by referencing manufacturer's pattern designation.

E. Special Units: Provide corner units, end units, cap units, and other special shapes as necessary to produce retaining walls of dimensions and profiles indicated and to provide indicated textures on exposed surfaces.

2.03 INSTALLATION MATERIALS

A. Pins: Product supplied by retaining wall unit manufacturer for use with units provided, made from non-degrading polymer reinforced with glass fibers.

B. Cap Adhesive: Product supplied or recommended by retaining wall unit manufacturer for adhering cap units to wall units below.

C. Drainage Fill: Washed gravel or washed crushed stone complying with ASTM D448 for Size No. 57.

D. Filter Fabric: Nonwoven pervious geotextile fabric equal to Mirafi 140N, manufactured by Mirafi, or approved equal.

E. Drainage Pipe: Polyethylene drainage tubing and fittings complying with AASHTO M 252, Type S, corrugated, with smooth waterway. Provide with corrugated, band-type couplings matching tubing and fittings.

F. Geotextile Fabric: A woven or non-woven geotextile fabric used for soil reinforcement per manufacturer's and design engineer's requirements.

G. Geogrid Reinforcement: Manufacturer's recommended polymer grid reinforcement per manufacturer's and design engineer's requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive segmental retaining walls and conditions under which walls will be installed, with Installer present, for compliance with requirements for excavation tolerances, condition of subgrades, and other conditions affecting performance of retaining wall system.

1. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 RETAINING WALL INSTALLATION

A. General: Place units according to manufacturer's written instructions. Lay units in running bond, overlapping half units of course below.

1. Form corners and ends by using special units.

B. Leveling Course: Place unreinforced, lean concrete over base course to thickness indicated; compact and screed to a smooth, level surface.

C. First Course: Place first course of retaining wall units on leveling base course for full length of wall. Place units in firm contact with each other, properly aligned and level.

1. Tamp units into leveling base as necessary to bring tops of units into a level plane.

2. Place and compact fill, either drainage fill or soil fill as indicated, to top of first course. Place fill on both sides of wall at same time without disturbing alignment of units. Fill voids between and within units with drainage fill.

D. Subsequent Courses: Sweep excess fill from tops of course below. Place units in firm contact, properly aligned, and directly on course below.

1. For units with lugs designed to fit into holes in units of adjacent course, lay units so lugs are accurately aligned with holes and bedding surfaces are firmly seated on beds of units below.

2. For units with lips at front of units, slide units as far forward as possible for firm contact with lips of units below.

3. For units with pins, carefully align holes in units above with holes below and insert pins according to manufacturer's written instructions.

4. Place and compact fill as each course is laid. Place fills on both sides of wall at same time, where both sides are indicated to be filled.

5. Fill voids between and within units with drainage fill.

E. Cap Units: Place cap units and secure cap units with recommended adhesive, according to manufacturer's written instructions.

3.03 FILL PLACEMENT

A. General: Comply with requirements of Section 313000, EARTHWORK (SITE) and retaining wall unit manufacturer's written instructions.

B. Place, spread, and compact fill in uniform lifts for full width and length of embankment as wall is being laid. Begin at back of wall and place and spread fill toward embankment.

1. Use only hand-operated compaction equipment within 36 inches (900 mm) of wall.

2. Compact drainage fill to not less than 95 percent maximum dry density according to ASTM D698.

3. Compact unreinforced soil fill to not less than 90 percent maximum dry density according to ASTM D698.

C. Place filter fabric against back of wall and place a layer of drainage fill at least 12 inches (300 mm) deep behind the filter fabric to within 12 inches (300 mm) of finished grade. Place another layer of filter fabric between drainage fill and soil fill.

1. Wrap drainage pipe with filter fabric and place in drainage fill as indicated, sloped 1/4 inch per foot (1:50) to drain.

2. Place impervious fill over top of drainage fill layer to depths indicated on the Drawings.

3.04 CONSTRUCTION TOLERANCES

A. Variation from Level: For bed-joint lines along walls, do not exceed 1/4 inch in 10 feet (6 mm in 3 m) or 1 inch in 40 feet (24 mm in 12 m), or more.

B. Variation from Indicated Batter: For slope of face of wall, do not vary from indicated slope by more than 1/4 inch in 10 feet (6 mm in 3 m).

C. Variation in Plan Position: For ends and faces of walls in relation to property lines, buildings, and other objects, do not vary from plan dimensions by more than 1 inch (25 mm) or from depicted plan relationship (scaled dimensions) by more than 3 inches (75 mm).

D. Variation in Linear Wall Line: For walls indicated as straight, do not exceed 1/4 inch in 10 feet (6 mm in 3 m) or 1 inch in 40 feet (24 mm in 12 m), or more from a straight line.

3.05 FIELD QUALITY CONTROL

A. Comply with requirements of Section 313000, EARTHWORK (SITE) for in-place soil density testing.

1. In each compacted backfill layer, perform at least one field in-place density test for each 100 feet (30 m) or less of retaining wall length, but no fewer than two tests along a wall face.

3.06 ADJUSTING AND CLEANING

A. Remove and replace segmental retaining walls of the following description:

1. Broken, chipped, stained, or otherwise damaged units.

2. Segmental retaining walls not matching approved samples and mockups.

3. Segmental retaining walls not complying with other requirements indicated.

B. Replace in a manner which results in segmental retaining wall matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

END OF SECTION 323223

Base Date: 06/03/2008; Revised 12/15/2008

SECTION 33 42 13 – PIPE CULVERTS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Work Included:
   1. Provide and install culvert, surface drain, and storm drain pipe and sections of the type(s), size(s) and in the location(s) shown on the Drawings and as specified herein.

B. Related Work Specified Elsewhere:
   1. Earthwork

1.2 SUBMITTALS

A. Submit, in duplicate, sworn certificates of inspections and tests performed at the location of manufacturers.

B. Submit shop drawings in accordance with the General Conditions of the Construction Contract.

1.3 DELIVERY, STORAGE AND HANDLING

A. Exercise care when handling pipe to prevent damage of any nature to pipe and finish.

B. Immediately remove damaged materials and replace at no additional cost to the Owner.

C. Store materials above ground on platforms, skids or other adequate supports.

1.4 FIELD QUALITY CONTROL

A. Acceptance will be on the basis of tests of materials and inspection of the complete product.

B. Inspection may be made at the place of manufacture or on the construction site after delivery, or both, and the pipe shall be subject to rejection at any time due to failure to meet all of the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture.

C. Immediately remove from the project site all rejected pipe.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe shall be one of the following as specified on the Drawings; substitutions only with the approval of the Engineer.
   1. Corrugated Aluminum Alloy Pipe
   2. Aluminum Coated (Type 2) Corrugated Steel Pipe
   3. Zinc-Coated (Galvanized) Corrugated Steel Pipe
   4. Steel Structural Plate Pipe
   5. Aluminum Alloy Structural Plate Pipe
   6. Polymer Precoated, Galvanized Corrugated Steel Pipe
   7. Polyvinyl Chloride (PVC) Pipe
   8. Corrugated Polyethylene (PE) Pipe
   9. Reinforced Concrete Pipe

B. Materials for pipes shall conform to AASHTO Standards.
   1. Corrugated Aluminum Alloy Pipe. This pipe and special fittings such as elbows, tees and wyes shall conform to the requirements of AASHTO M196, Type I or II. Special sections, such as elbows and metal end sections, shall be of the gage called for on the plans and shall conform to the applicable requirements of AASHTO M196. Steel sheet shall conform to the requirements of AASHTO M197.
   2. Aluminum Coated (Type 2) Corrugated Steel Pipe. This pipe shall conform to the requirements of AASHTO M36 using steel sheet conforming to AASHTO M274.
   3. Zinc - Coated (Galvanized) Corrugated Steel Pipe. This pipe shall conform to the requirements of AASHTO M36 using steel sheet conforming to AASHTO M218.
   4. Steel Structural Plate Pipe. Plates, bolts, nuts and other accessories shall conform to the requirements of AASHTO specification M167 and the following additional requirements:
      a. All shop welding shall meet the requirements of the latest edition of AWS D1.1, Structural Welding Code - Steel.
      b. Annually the fabricator shall have quality control tests performed on uncoated random samples of the lightest and heaviest gage plates produced by welding. The sampling and testing shall be done by a recognized independent testing agency and copies of the test reports, including all welding parameters, shall be submitted to the Engineer as requested.
      c. No field welding will be allowed.
   5. Aluminum Alloy Structural Plate Pipe. Plates, bolts and nuts for this pipe shall conform to the requirements of AASHTO M219.
   6. Polymer Precoated, Galvanized Corrugated Steel Pipe. This pipe and special fittings such as elbows, tees and wyes shall conform to the requirements of AASHTO M245, Type I, with Type B coating for the pipe as specified in AASHTO M246 with the thinner coating on the outside.

7. PVC (Polyvinylchloride) Pipe. This pipe and fittings shall conform to the requirements of AASHTO M278. All pipe shall be supplied with gasket type joints meeting the requirements of ASTM D3212.
8. Corrugated polyethylene pipe. This pipe and fittings shall conform to the requirements of AASHTO M252 and AASHTO M294.
9. Reinforced Concrete Pipe. This pipe shall conform to the requirements of AASHTO M170, (ASTM C76) except paragraph 6.2. Elliptical pipe shall conform to the requirement of AASHTO M207, except paragraph 6.2. Unless otherwise specified, pipe wall design and use of elliptical reinforcement in circular pipe are optional. Pipe arch shall conform to the requirements of AASHTO M206, except paragraph 6.2. Aggregates shall meet the requirements of MDOT Standard Specifications Subsections 703.01 and 703.02 for fine aggregates and coarse aggregates respectively, except that grading requirements are hereby waived. Precast reinforced concrete special sections shall conform to the requirements of the cited specifications to the extent to which they apply.

C. Area Drain Assemblies. Nyloplast Inline Drain with 8” Bronze Insert Grate. Drain Basin not required.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas to receive piping for the following
   1. Obstructions that adversely affect the installation and quality of the work.
   2. Deviations beyond allowable tolerances for clearances.

B. Examine pipe and fittings before installation to assure no defective materials are incorporated.

C. Start the work only when conditions are satisfactory.

D. Remove and replace all defective materials at no additional cost to the Owner.

3.2 INSTALLATION

A. Do not install pipe, nor backfill, between December 15 and April 1 without the written permission of the Engineer.

B. Begin laying the pipe at the downstream end. Install bells upstream.

C. Place metal pipe with the longitudinal laps of seams at the sides and the outside laps of circumferential joints pointing up grade.

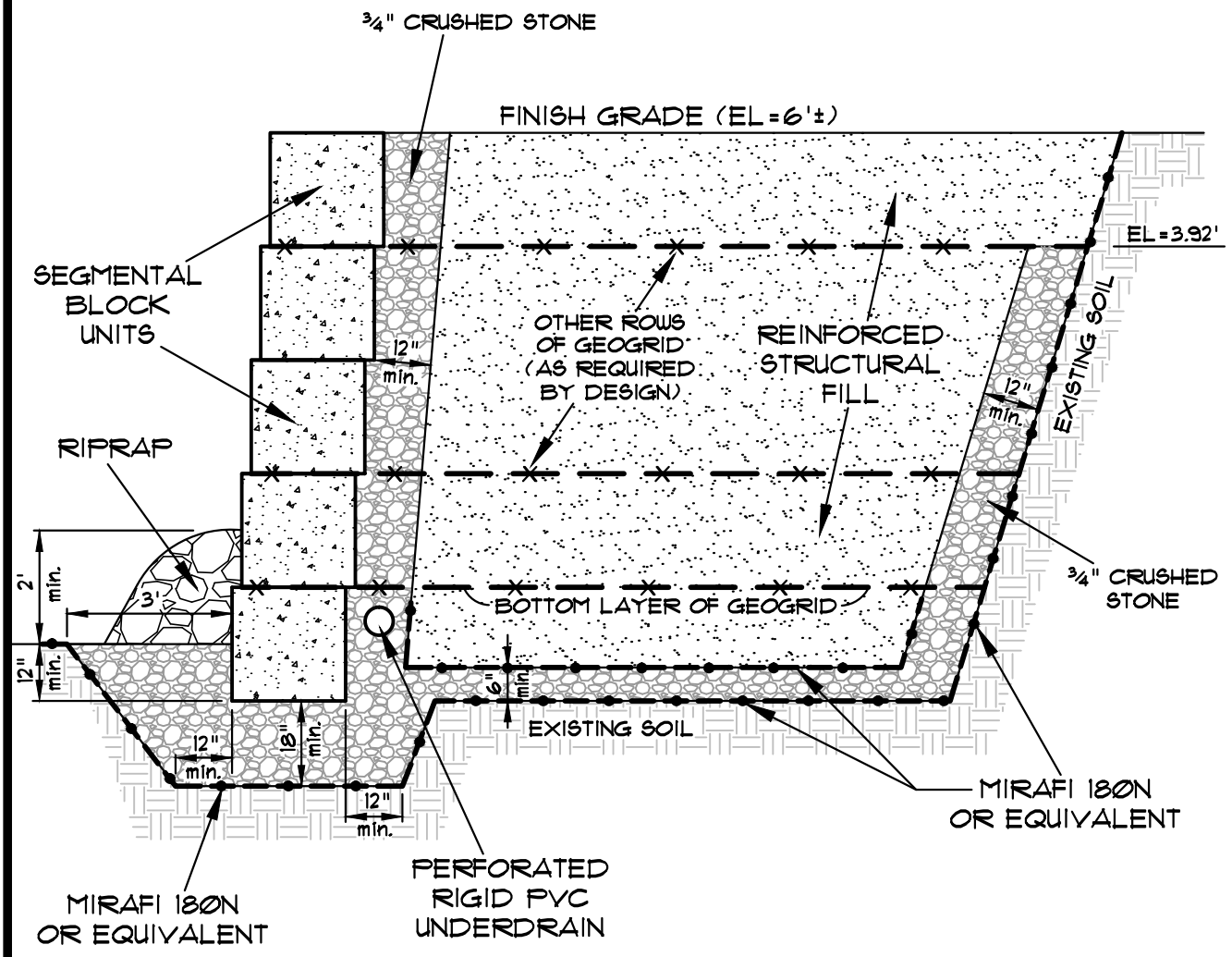
D. Lay paved or partially lined pipe with the lining on the bottom.

E. Join flexible pipe sections and metal end sections by coupling bands.

F. Assemble the plates for structural plate arches according to the manufacturer's assembly instructions and as shown on the Drawings.

G. Place armor stones at inlets and outlets.

END OF SECTION 33 42 13



TYPICAL SCHEMATIC WALL CROSS SECTION

NOT TO SCALE

NOTE

THIS DETAIL DEPICTS THE FINAL WALL CONDITIONS AND DOES NOT NECESSARILY REPRESENT CONDITIONS DURING CONSTRUCTION OF THE WALL

RETAINING WALL DETAIL
TIMBER BULKHEAD REPLACEMENT

RIVER ROAD - RICHMOND, MAINE

PREPARED FOR

GARTLEY & DORSKY

DATE: 9-15-2015	DRAWN BY: KRF	CHECKED BY: WMP
JOB: 14165	NOT TO SCALE	FILE: 14165 BOR

145 LISBON ST. - SUITE 601
LEWISTON, ME 04240
Tel.: (207) 576-3313

173 PLEASANT STREET
ROCKLAND, ME 04841
Tel.: (207) 318-7761

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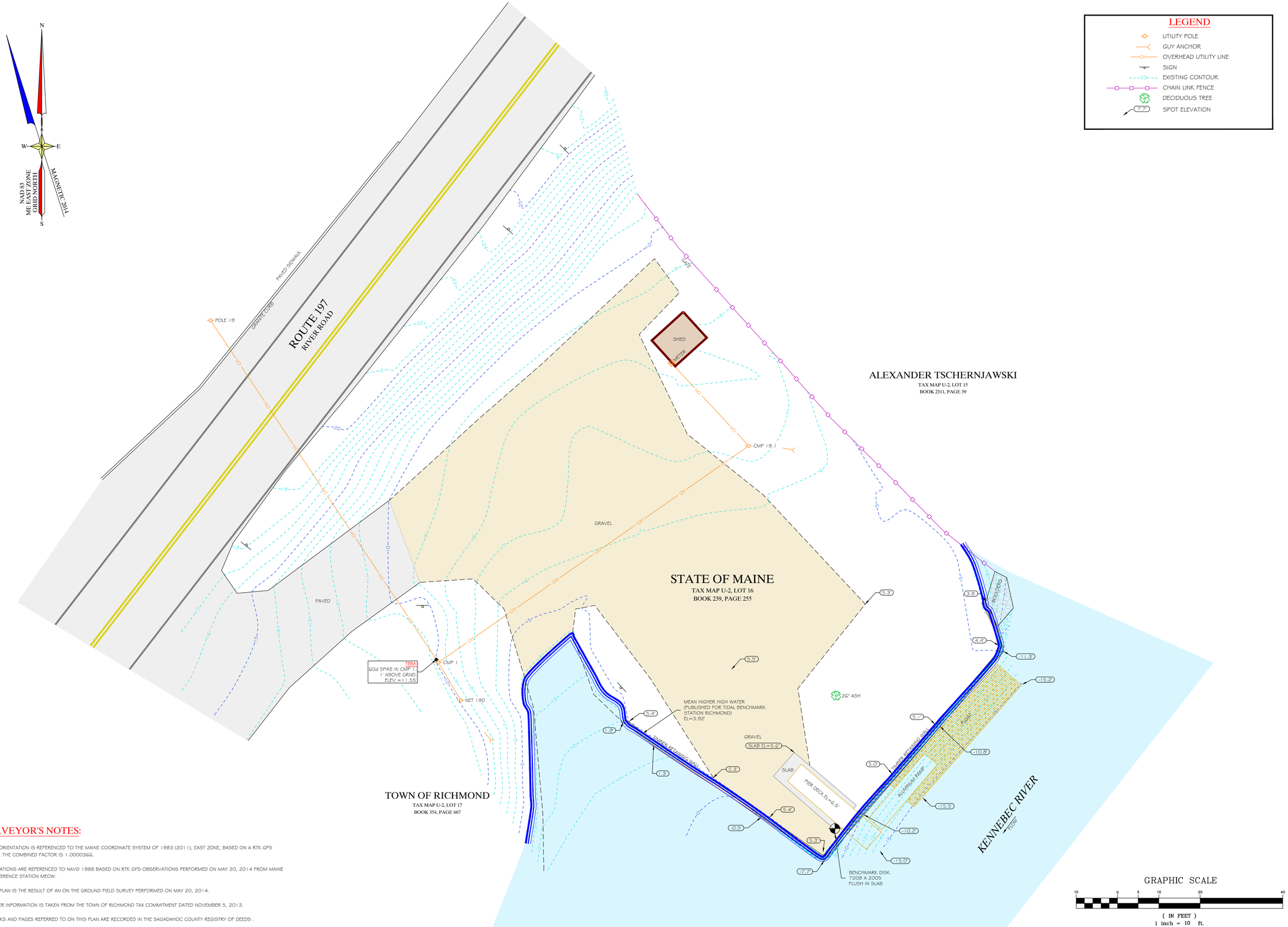


SURVEYOR'S NOTES:

1) PLAN ORIENTATION IS REFERENCED TO THE MAINE COORDINATE SYSTEM OF 1983 (2011), EAST ZONE, BASED ON A RTK GPS SURVEY. THE COMBINED FACTOR IS 1.0000366.

2) ELEVATIONS ARE REFERENCED TO NAVD 1988 BASED ON RTK GPS OBSERVATIONS PERFORMED ON MAY 20, 2014 FROM MAINE DOT REFERENCE STATION MEOW.

3) THIS PLAN IS THE RESULT OF AN ON THE GROUND FIELD SURVEY PERFORMED ON MAY 20, 2014.

4) OWNER INFORMATION IS TAKEN FROM THE TOWN OF RICHMOND TAX COMMITMENT DATED NOVEMBER 5, 2013.

5) BOOKS AND PAGES REFERRED TO ON THIS PLAN ARE RECORDED IN THE SAGADAHOC COUNTY REGISTRY OF DEEDS .

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

NO.	REVISIONS	DATE
1	ADD MHHW	8/7/14

SHEET TITLE: **AS-BUILT AND TOPOGRAPHIC SURVEY**

SCALE: 1" = 10'

DRAWN BY: AW

CHECKED BY: JAD

DATE: MAY 20, 2014

CLIENT/PROJECT: **MAINE INLAND FISHERIES AND WILDLIFE**

LOCATION: RIVER ROAD

TOWN: RICHMOND COUNTY: SAGADAHOC STATE: MAINE

Gartley & Dorsky ENGINEERING SURVEYING
59B Union Street P.O. Box 1051 Camden, ME 04843-1051
Ph (207) 236-4465 Fax (207) 236-3655 Toll Free 1-888-282-4465
165 Main Street Suite 2F P.O. Box 1072 Damariscotta, Maine 04543
Ph. (207) 790-5005

THIS PLAN PRELIMINARY

STATE OF MAINE ADDISON A WHITWORTH #2424 REGISTERED PROFESSIONAL LAND SURVEYOR

WITHOUT SIGNATURE

PROJ. NO. 2014-104

SV-1

SURVEYOR'S NOTES:

1) BOOKS AND PAGES REFERRED TO ON THIS PLAN ARE RECORDED IN THE SAGADAHOC COUNTY REGISTRY OF DEEDS (SCRD).

2) ALL DIRECTIONS ARE REFERENCED TO THE MAINE COORDINATE SYSTEM OF 1983 (2011), EAST ZONE, DERIVED FROM A RTK GPS SURVEY COMPLETED IN MAY 2014.

3) PROPERTY LINE DESCRIPTIONS IN SEVERAL DEEDS IN THE CHAINS OF TITLE FOR THE SURVEYED PARCEL , ADJOINING PROPERTIES, AND OTHER NEARBY PROPERTIES ARE VERY VAGUE AND CONTAIN SEVERAL REFERENCES FOR PROPERTY LINE LOCATIONS RELATIVE TO STRUCTURES OR OTHER IMPROVEMENTS THAT NO LONGER EXIST, REFERENCES FOR PROPERTY LINE LOCATIONS RELATIVE TO PHYSICAL FEATURES OF THE LAND THAT ARE NO LONGER DISCERNABLE, AND/OR REFER TO PROPERTY MARKERS THAT WERE NOT RECOVERED AS MANY IMPROVEMENTS AND CHANGES APPEAR TO HAVE BEEN MADE ON THE PROPERTIES SINCE THE TIME THESE PROPERTY LINES WERE FIRST CREATED AND DESCRIBED. FURTHERMORE, THERE WERE ALSO SEVERAL INCONSISTENCIES DISCOVERED WITHIN THE VARIOUS RECORDS THAT WERE NOT ABLE TO BE RECONCILED DUE TO THE LACK OF AVAILABLE PHYSICAL EVIDENCE AS REFERENCED IN SAID RECORDS.

THE "POTENTIAL RECORD PROPERTY LINES" SHOWN ON THIS PLAN ARE ONLY INTENDED TO ILLUSTRATE THE NATURE OF THE DISCREPANCIES BETWEEN THESE LINES AND THE LOCATION OF APPARENT OCCUPATION LINES. THE LOCATIONS OF THE "POTENTIAL RECORD PROPERTY LINES" ARE APPROXIMATE AND MAY NOT COINCIDE WELL WITH THE TRUE LOCATION OF THE RECORD PROPERTY LINES. BOUNDARY LINE AGREEMENTS TO ESTABLISH THE PROPERTY LINES OF THE SURVEYED PARCEL ARE RECOMMENDED AS DESCRIBED BELOW.

4) SOUTHWESTERLY BOUNDARY LINE: SEVERAL OF THE HISTORIC DEEDS REVIEWED FOR BOTH THE SURVEYED PARCEL AND ABUTTING PROPERTIES, AS WELL AS SOME OF THE PLANS REFERENCED BELOW, REFER TO AND/OR GENERALLY DEPICT THE TOWN LANDING AS BEING SITUATED ON THE SOUTHERLY SIDE OF THE SURVEYED PARCEL. NO DEEDS, SURVEY PLANS, OR OTHER DOCUMENTS ACCURATELY DESCRIBING OR DEPICTING THE BOUNDARIES OF THE TOWN LANDING PROPERTY WERE FOUND. IN ADDITION TO THIS, THERE WERE MANY INCONSISTENCIES DISCOVERED WITHIN THE HISTORIC DEEDS FOR THE SURVEYED PARCEL AND ADJOINING PROPERTIES MAKING IT DIFFICULT TO ACCURATELY DETERMINE THE RECORD LOCATION OF THE SOUTHWESTERLY PROPERTY LINE OF THE SURVEY PARCEL. ACCORDINGLY, A BOUNDARY LINE THAT APPEARS TO GENERALLY COMPORT WITH THE CURRENT AND HISTORIC USE OF THE LAND WITH THE TOWN LANDING BEING SITUATED ON THE SOUTHERLY SIDE THEREOF HAS BEEN DRAWN ON THIS PLAN. A BOUNDARY LINE AGREEMENT TO ESTABLISH THIS LOCATION AS THE COMMON PROPERTY LINE BETWEEN THE PROPERTIES IS RECOMMENDED.

5) NORTHEASTERLY BOUNDARY LINE: THE RECORD DOCUMENTS APPEAR TO INDICATE THAT THIS PROPERTY LINE COULD BE LOCATED APPROXIMATELY FIFTY (50) FEET NORTHEASTERLY OF THE CHAIN LINK FENCE SHOWN ON THIS PLAN. VAGUE DESCRIPTIONS IN THE RECORD DOCUMENTS COUPLED WITH A LACK OF EXISTING PHYSICAL BOUNDARY EVIDENCE MAKE IT VERY DIFFICULT TO ACCURATELY AND CONCLUSIVELY CONFIRM THE LOCATION OF THIS PROPERTY LINE. DURING A CONVERSATION WITH MR. TSCHERNJAWSKI HE STATED THAT HE HAS RESIDED AT THE ABUTTING PROPERTY FOR APPROXIMATELY 19 YEARS AND ALWAYS OBSERVED THE CHAIN LINK FENCE AS THE COMMON PROPERTY LINE BETWEEN THESE PROPERTIES. A VISUAL INSPECTION OF THE PROPERTY INDICATES THAT THE STATE OF MAINE ALSO APPEARS TO BE OBSERVING THE CHAIN LINK FENCE AS THE COMMON PROPERTY LINE. ACCORDINGLY, A BOUNDARY LINE AGREEMENT TO ESTABLISH THE APPARENT OCCUPATION LINE RUNNING ALONG THE CHAIN LINK FENCE AS THE COMMON PROPERTY LINE IS RECOMMENDED.

6) THE SURVEYED PARCEL IS BURDENED BY AN EXISTING TWO ROD WIDE RIGHT OF WAY RUNNING FROM FRONT STREET TO THE PROPERTY OF TSCHERNJAWSKI. NO DEEDS, SURVEY PLANS, OR OTHER DOCUMENTS ACCURATELY DESCRIBING OR DEPICTING THE LOCATION OF THIS RIGHT OF WAY WERE FOUND. THIS RIGHT OF WAY WAS FIRST FOUND DESCRIBED IN A DEED OF JOHN HATHORN TO NATHANIEL KIMBALL, DATED APRIL 30, 1846, RECORDED AT THE S.C.R.D. IN THE WEST LINCOLN RECORDS BOOK 25, PAGE 131. BOUNDARY LINE AGREEMENTS TO CONFIRM THE APPARENT LIMITS OF SAID RIGHT OF WAY AS SHOWN ON THIS PLAN ARE RECOMMENDED.

7) ALL IRON PINS TO BE SET ARE 5/8" REBAR MARKED WITH A PLASTIC SURVEYOR'S CAP STAMPED "G4D 2290-2366-2424-2473".

8) THIS PLAN IS THE RESULT OF AN ON THE GROUND FIELD SURVEY PERFORMED ON MAY 20, 2014 & DECEMBER 29, 2014.

9) OWNER INFORMATION IS TAKEN FROM THE TOWN OF RICHMOND TAX COMMITMENT DATED NOVEMBER 5, 2013.

PLAN REFERENCES:

1) "MAP OF THE TOWN OF RICHMOND, SAGADAHOC COUNTY" DATED 1855, AS FOUND AT THE RICHMOND TOWN OFFICE.

2) "PLAN OF SURVEY FOR RICHMOND WATER WORKS, FRONT STREET, RICHMOND, MAINE" BY WILLIAM S. ROLLINS, JR., DATED JULY 23, 1966, AS RECORDED IN PLAN BOOK 8, PAGE 3 AT THE S.C.R.D.

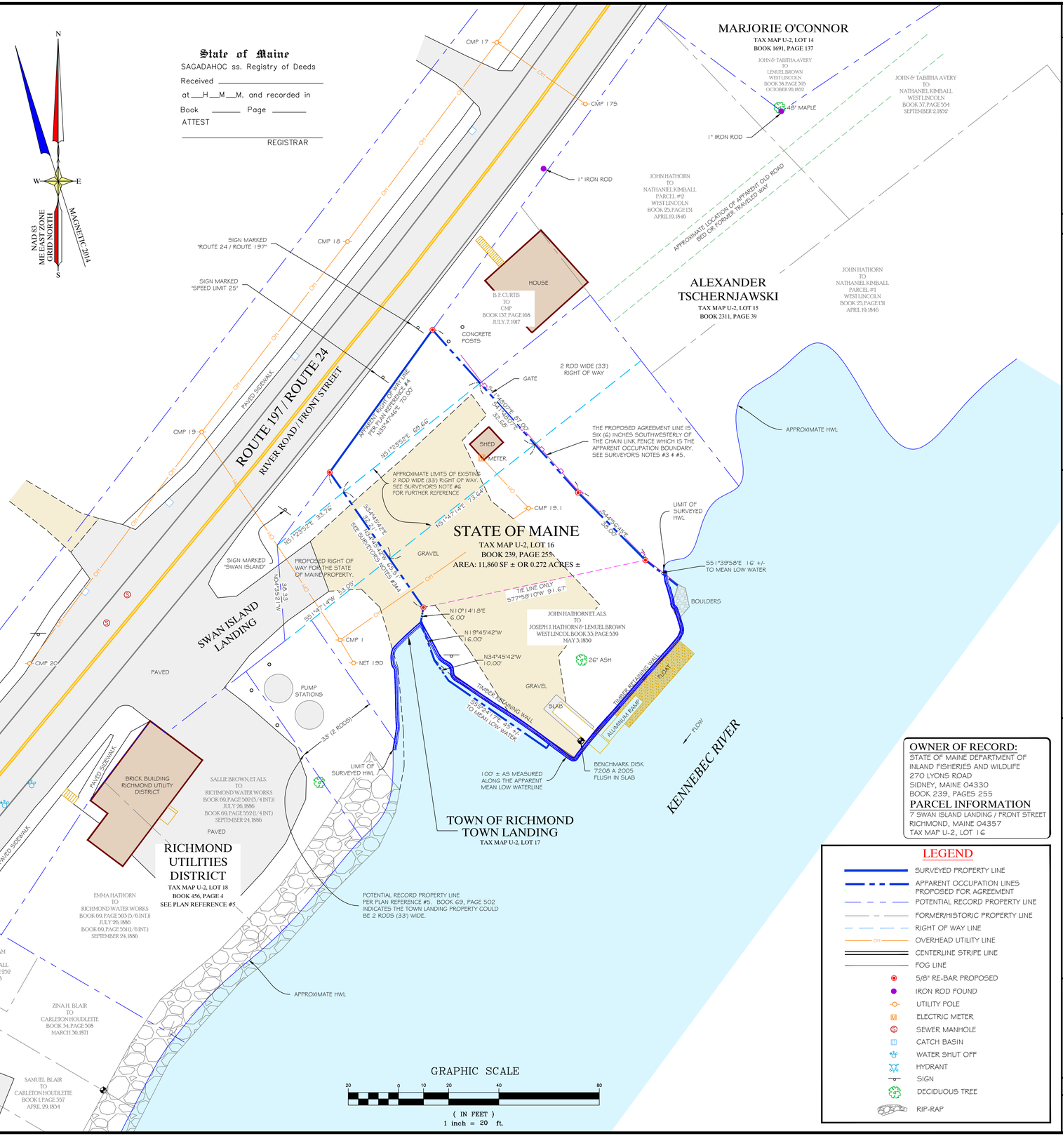
3) "MAINE STATE HIGHWAY COMMISSION RIGHT OF WAY MAP, STATE AID HIGHWAY NO. 1 & S.H. 164, RICHMOND, SAGADAHOC COUNTY, FEDERAL AID PROJECT S-0157(5), S.H.C. FILE NO. 12-59, SHEET 2 OF 2", AS SIGNED BY SYLVESTER L. POOR CHIEF ENGINEER, DATED MARCH 1966, AS RECORDED IN PLAN BOOK 8 PAGES 24A AT THE S.C.R.D.

4) "STATE OF MAINE DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP, STATE HIGHWAY #164 RICHMOND, SAGADAHOC COUNTY, FEDERAL AID PROJECT NO. RS-1645(6), D.O.T. FILE NO. 12-92, SHEET 3 OF 3", AS SIGNED BY RICHARD A. COLEMAN, DATED NOVEMBER 1989, AS RECORDED IN PLAN BOOK 5 PAGES 493 AT THE S.C.R.D.

5) BOUNDARY RETRACEMENT & TOPOGRAPHIC SURVEY FOR THE FORT RICHMOND WATERFRONT PROJECT, RICHMOND, SAGADAHOC COUNTY, MAINE", BY FALLA & SONS LAND SURVEYS, INC., DATED MAY 16, 2009.

CERTIFICATION:

TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF, AND IN MY PROFESSIONAL OPINION, THIS SURVEY CONFORMS TO THE STANDARDS OF PRACTICE PROMULGATED BY THE MAINE BOARD OF LICENSURE FOR PROFESSIONAL LAND SURVEYORS WITH THE FOLLOWING EXCEPTIONS:
NO WRITTEN REPORT PREPARED
BOUNDARY MARKERS HAVE NOT YET BEEN PLACED AT ALL PROPERTY CORNERS.



OWNER OF RECORD:
STATE OF MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE
270 LYONS ROAD
SIDNEY, MAINE 04330
BOOK 239, PAGES 255

PARCEL INFORMATION
7 SWAN ISLAND LANDING / FRONT STREET
RICHMOND, MAINE 04357
TAX MAP U-2, LOT 16

LEGEND

- SURVEYED PROPERTY LINE
- APPARENT OCCUPATION LINES PROPOSED FOR AGREEMENT
- POTENTIAL RECORD PROPERTY LINE
- FORMER/HISTORIC PROPERTY LINE
- RIGHT OF WAY LINE
- OH — OVERHEAD UTILITY LINE
- CENTERLINE STRIPE LINE
- FOG LINE
- 5/8" RE-BAR PROPOSED
- IRON ROD FOUND
- UTILITY POLE
- ELECTRIC METER
- SEWER MANHOLE
- CATCH BASIN
- WATER SHUT OFF
- HYDRANT
- SIGN
- DECIDUOUS TREE
- RIP-RAP

NO.	REVISIONS	DATE

SHEET TITLE: **BOUNDARY SURVEY**
SCALE: 1" = 20'
DRAWN BY: DAS, JR.
CHECKED BY: JAD
DATE: FEBRUARY 8, 2015

CLIENT/PROJECT: **MAINE INLAND FISHERIES AND WILDLIFE**
LOCATION: 7 SWAN ISLAND LANDING / FRONT STREET
TOWN: RICHMOND COUNTY: SAGADAHOC STATE: MAINE

Gartley & Dorsky ENGINEERING SURVEYING
59B Union Street P.O. Box 1031 Camden, ME 04843-1031
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165 Main Street Suite 2F P.O. Box 1072 Damariscotta, Maine 04543
Ph. (207) 790-5005

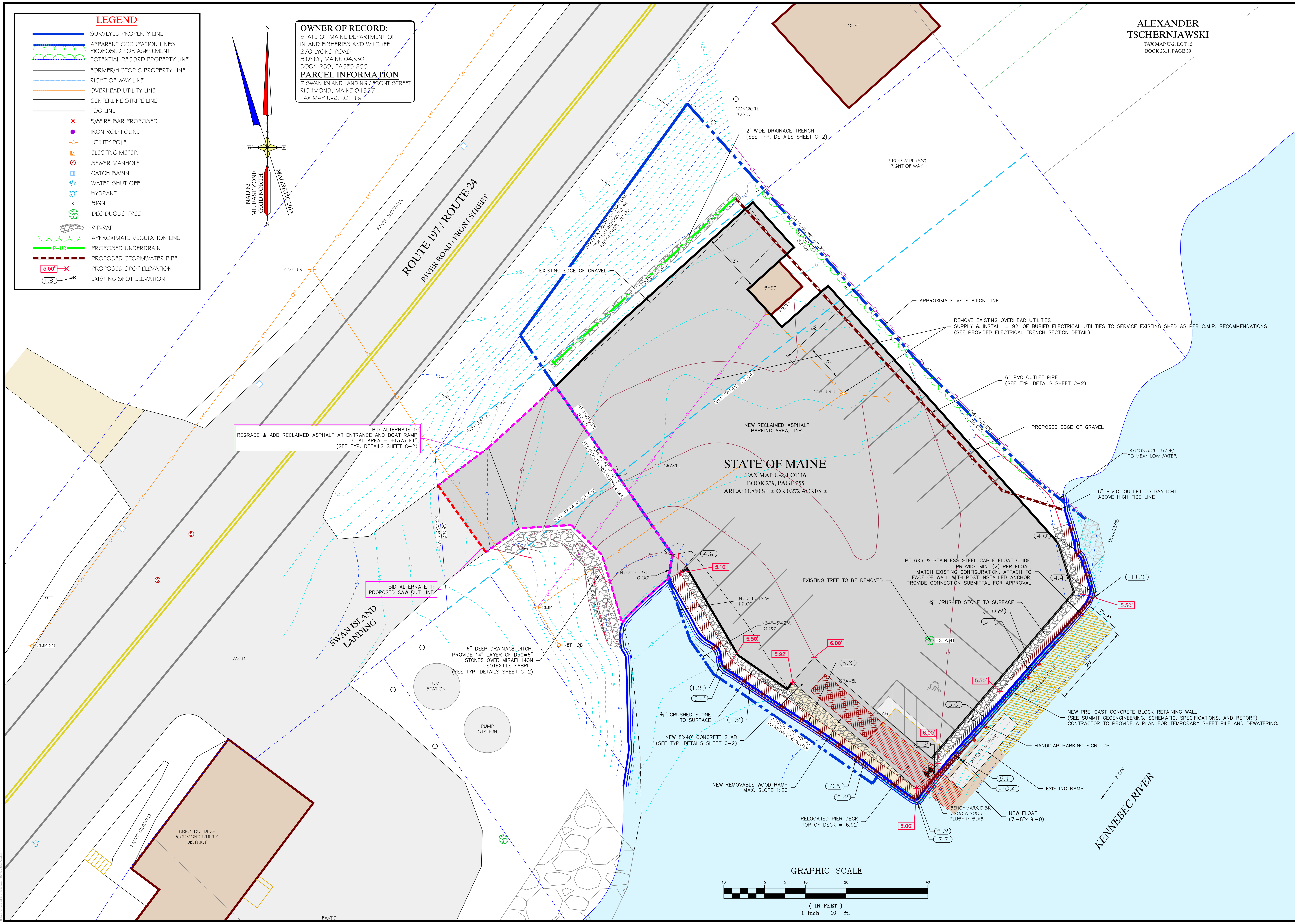
THIS PLAN IS PRELIMINARY UNLESS SIGNED AND SEALED BELOW

STATE OF MAINE — DAVID A. STARR JR. — 2290 — REGISTERED LAND SURVEYOR

WITHOUT SEAL AND SIGNATURE

PROJ. NO. 2014-104

SV-2


LEGEND
SURVEYED PROPERTY LINE
APPARENT OCCUPATION LINES PROPOSED FOR AGREEMENT
POTENTIAL RECORD PROPERTY LINE
FORMER/HISTORIC PROPERTY LINE
RIGHT OF WAY LINE
OVERHEAD UTILITY LINE
CENTERLINE STRIPE LINE
FOG LINE
5/8" RE-BAR PROPOSED
IRON ROD FOUND
UTILITY POLE
ELECTRIC METER
SEWER MANHOLE
CATCH BASIN
WATER SHUT OFF
HYDRANT
SIGN
DECIDUOUS TREE
RIP-RAP
APPROXIMATE VEGETATION LINE
PROPOSED UNDERDRAIN
PROPOSED STORMWATER PIPE
PROPOSED SPOT ELEVATION
EXISTING SPOT ELEVATION
OWNER OF RECORD:
STATE OF MAINE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE
270 LYONS ROAD
SIDNEY, MAINE 04330
BOOK 239, PAGES 255
PARCEL INFORMATION
7 SWAN ISLAND LANDING / FRONT STREET
RICHMOND, MAINE 04357
TAX MAP U-2, LOT 16
NAD 83 ME EAST ZONE GRID NORTH
MAGNETIC 2014
ALEXANDER TSCHERNJAWSKI
TAX MAP U-2, LOT 15
BOOK 2311, PAGE 39
HOUSE
ROUTE 197 / ROUTE 24
RIVER ROAD / FRONT STREET
STATE OF MAINE
TAX MAP U-2, LOT 16
BOOK 239, PAGE 255
AREA: 11,860 SF ± OR 0.272 ACRES ±
NEW RECLAIMED ASPHALT PARKING AREA, TYP.
2' WIDE DRAINAGE TRENCH (SEE TYP. DETAILS SHEET C-2)
2 ROD WIDE (33') RIGHT OF WAY
APPROXIMATE VEGETATION LINE
REMOVE EXISTING OVERHEAD UTILITIES SUPPLY & INSTALL ± 92' OF BURIED ELECTRICAL UTILITIES TO SERVICE EXISTING SHED AS PER C.M.P. RECOMMENDATIONS (SEE PROVIDED ELECTRICAL TRENCH SECTION DETAIL)
6" PVC OUTLET PIPE (SEE TYP. DETAILS SHEET C-2)
PROPOSED EDGE OF GRAVEL
6" P.V.C. OUTLET TO DAYLIGHT ABOVE HIGH TIDE LINE
EXISTING EDGE OF GRAVEL
BID ALTERNATE 1: REGRADE & ADD RECLAIMED ASPHALT AT ENTRANCE AND BOAT RAMP TOTAL AREA = ±1375 FT² (SEE TYP. DETAILS SHEET C-2)
BID ALTERNATE 1: PROPOSED SAW CUT LINE
PT 6X6 & STAINLESS STEEL CABLE FLOAT GUIDE, PROVIDE MIN. (2) PER FLOAT, MATCH EXISTING CONFIGURATION, ATTACH TO FACE OF WALL WITH POST INSTALLED ANCHOR, PROVIDE CONNECTION SUBMITTAL FOR APPROVAL
EXISTING TREE TO BE REMOVED
¾" CRUSHED STONE TO SURFACE
6" DEEP DRAINAGE DITCH. PROVIDE 14" LAYER OF D50=6" STONES OVER MIRAFI 140N GEOTEXTILE FABRIC. (SEE TYP. DETAILS SHEET C-2)
NEW 8'x40' CONCRETE SLAB (SEE TYP. DETAILS SHEET C-2)
NEW REMOVABLE WOOD RAMP MAX. SLOPE 1:20
RELOCATED PIER DECK TOP OF DECK = 6.92'
BENCHMARK DISK 7208 A 2005 FLUSH IN SLAB
NEW FLOAT (7'-8"x19'-0)
EXISTING RAMP
HANDICAP PARKING SIGN TYP.
NEW PRE-CAST CONCRETE BLOCK RETAINING WALL. (SEE SUMMIT GEOENGINEERING, SCHEMATIC, SPECIFICATIONS, AND REPORT) CONTRACTOR TO PROVIDE A PLAN FOR TEMPORARY SHEET PILE AND DEWATERING.
KENNEBEC RIVER
SWAN ISLAND LANDING
PUMP STATION
BRICK BUILDING RICHMOND UTILITY DISTRICT
PAVED
SHED
GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

CLIENT/PROJECT:
MAINE DEPARTMENT OF IF&W STEVE POWELL WILDLIFE MANAGEMENT AREA

LOCATION: 7 SWAN ISLAND LANDING / FRONT STREET

TOWN: RICHMOND COUNTY: SAGADAHOC STATE: MAINE

SHEET TITLE:
SITE PLAN

SCALE: 1" = 10'

DATE: OCTOBER 20, 2015

DRAWN BY: JAM/JDS
CHECKED BY: WG

NO. REVISIONS DATE

Gartley & Dorsky ENGINEERING SURVEYING
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Ph. (207) 790-5005

STATE OF MAINE WILLIAM B. GARTLEY 7961 LICENSED PROFESSIONAL ENGINEER 10-20-15

PROJ. NO. 2014-104

C-1

CONTROL NOTES

IN ORDER TO PROTECT THE SOIL AND WATER RESOURCES OF THIS DEVELOPMENT AND ADJACENT LANDS, THE FOLLOWING ACTIONS SHALL BE TAKEN:

(WHEN CONSTRUCTION IS INITIATED ON FROZEN GROUND, WOOD WASTE COMPOST/BARK FILTER BERM SHALL BE UTILIZED IN LIEU OF SILT FENCE. SEE DETAIL, THIS SHEET.)

A. EROSION CONTROL/TEMPORARY MEASURES

THE FOLLOWING TEMPORARY MEASURES TO CONTROL EROSION AND SEDIMENTATION SHALL BE USED.

1. SEDIMENT BARRIER (SILT FENCE OR WOOD WASTE COMPOST/BARK FILTER (BERM) WILL BE INSTALLED AROUND THE LIMITS OF CLEARING ASSOCIATED WITH EACH PORTION OF THIS PROJECT. THE CONTRIBUTING DRAINAGE AREA IS LESS THAN ¼ ACRE PER 100 ft. OF BARRIER LENGTH (THE MAXIMUM LENGTH OF SLOPE ABOVE THE BARRIER IS 100 FEET AND THE MAXIMUM GRADIENT BEHIND THE BARRIER IS 50 PERCENT (2:1). IF THE SLOPE IS GREATER, OTHER MEASURES SUCH AS DIVERSIONS MAY BE NECESSARY TO REDUCE THE SLOPE LENGTH. SEDIMENT BARRIER SHALL REMAIN IN PLACE UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. SEDIMENT BARRIER WILL BE INSTALLED TO SPECIFICATIONS OUTLINED IN THE MOST RECENT MAINE EROSION AND SEDIMENTATION CONTROL HANDBOOK FOR CONSTRUCTION: BEST MANAGEMENT PRACTICES.

2. EACH GROUND AREA OPENED OR EXPOSED, WHETHER DIRECTLY OR INDIRECTLY DUE TO THE PROJECT CONSTRUCTION, SHALL BE MINIMIZED AND SHALL BE STABILIZED WITHIN 15 DAYS OF THE INITIAL DISTURBANCE OF THE MINERAL SOIL, AND SHALL BE PERMANENTLY STABILIZED WITHIN 7 DAYS OF FINAL GRADING.

3. TEMPORARY SOIL STABILIZATION SHALL BE EITHER BY TEMPORARY MULCHING, TEMPORARY SEEDING, PERMANENT BASE GRAVEL, OR ASPHALT BASE COURSE AS FOLLOWS:
   - TEMPORARY SEEDING SEED SHALL BE AROOSTOOK RYE APPLIED AT 3.0#/1000 sf. LIME SHALL BE AGRICULTURAL GROUND LIMESTONE APPLIED AT 138#/1000 sf. FERTILIZER SHALL BE 10-10-10 CLASSIFICATION APPLIED AT 13.8#/1000 sf. MULCH SHALL CONSIST OF HAY OR STRAW MULCH AND SPREAD EVENLY AT A RATE OF 70-90#/1000 sf. TEMPORARY SEEDINGS SHALL ONLY BE MADE BETWEEN APRIL 15TH AND OCTOBER 15TH, AND SHALL NOT BE PLACED OVER SNOW. IF THE SEEDING IS NOT COMPLETED BY OCTOBER 15TH, ADDITIONAL MULCH SHALL BE ADDED TO PROVIDE ADEQUATE WINTER PROTECTION.
   - TEMPORARY MULCHING MULCH SHALL CONSIST OF CHOPPED HAY OR STRAW MULCH AND SPREAD BY MECHANICAL BLOWER, OR BY HAND IF ADJACENT TO WETLAND HABITAT, EVENLY AT A RATE OF 150-200#/1000 sf. TEMPORARY MULCH SHALL BE REMOVED PRIOR TO PERMANENT SOIL STABILIZATION. MULCH MUST NOT BE PLACED OVER SNOW.
   - PERMANENT BASE GRAVEL BASE GRAVEL UNDER PAVEMENT SHALL BE SUITABLE AS TEMPORARY SOIL STABILIZATION UNDER THE FOLLOWING CONDITIONS:
     A. SLOPES SHALL BE LESS THAN 5 PERCENT.
     B. GRAVEL SHALL MEET THE SPECIFICATIONS FOR BASE OR SUB-BASE GRAVEL FOR THE PROPOSED COMPLETED PAVEMENT.
   - ASPHALT BASE COURSE ASPHALT BASE SHALL MEET THE SPECIFICATIONS FOR THE ASPHALT BASE COURSE FOR THE PROPOSED COMPLETED PAVEMENT.

4. PRIOR TO TOPSOIL REMOVAL, SILT FENCING SHALL BE STAKED AS SHOWN ON THE PLAN.

5. STRIPPED TOPSOIL SHALL BE STOCKPILED FOR REUSE DURING FINAL GRADING. THE PILE SHALL BE HEAVILY MULCHED WITH HAY WHILE STOCKPILED.

6. TO REDUCE OR ELIMINATE THE TRACKING OF EARTH MATERIALS ONTO PUBLIC RIGHT-OF-WAYS, A STABILIZED PAD OF CRUSHED STONE LOCATED AT THE DESIGNATED ACCESS POINT SHALL BE ESTABLISHED.

B. EROSION CONTROL/PERMANENT MEASURES

1. EXCESSIVELY STEEP SLOPES (2:1 OR GREATER) SHALL BE PROTECTED BY EROSION CONTROL EXCELSIOR BLANKET WITH BIODEGRADABLE PLASTIC OR JUTE MESH AFTER SEEDING.

2. PERMANENT SEEDING SHALL BE PERFORMED DURING CONSTRUCTION OPERATIONS AS EACH DISTURBED AREA HAS BEEN BROUGHT TO FINISH GRADE. ALL AREAS SHALL BE SEEDED WITH ONE OF THE FOLLOWING:
   A. CONSERVATION/WILDLIFE MIX
      20% KENTUCKY BLUEGRASS — 6% WHITE CLOVER
      30% CREEPING RED FESCUE — 15% ANNUAL RYEGRASS
      15% PERENNIAL RYEGRASS — 14% PENNFINE RYEGRASS

   B. COTTAGE MIX
      50% CREEPING RED FESCUE — 20% ANNUAL RYEGRASS
      15% PERENNIAL RYEGRASS — 15% TALL FESCUE

   C. PARK MIX
      25% KENTUCKY BLUEGRASS — 20% ANNUAL RYEGRASS
      30% CREEPING RED FESCUE — 10% PERENNIAL RYEGRASS
      15% CHEWING FESCUE

   D. NORTHEAST WILDFLOWER MIX (SEE NOTE 4 THIS SECTION)

OF PROVIDING PROTECTION AGAINST TRAFFIC AND REPAIRING ANY AREAS DAMAGED DUE TO WIND, WATER, EROSION, FIRE OR OTHER CAUSES. SUCH DAMAGED AREAS SHALL BE REPAIRED TO RE-ESTABLISH THE CONDITION AND GRADE OF THE SOIL PRIOR TO SEEDING AND SHALL THEN BE RE-FERTILIZED, RE-SEEDED AND RE-MULCHED.

4. PERMANENT WILDFLOWER STABILIZATION: PROVIDE 3" OF LOAM OVER DISTURBED OR NEWLY GRADED SLOPES. APPLY WILDFLOWER SEED MIX ACCORDING TO THE FOLLOWING MIX SPECIFICATIONS. ESTABLISH WILDFLOWER MIX PRIOR TO SEPTEMBER 1. MULCH SHALL BE WEED-SEED FREE STRAW MULCH, APPLIED AT THE RATE OF 4 BALES PER 1000 SQUARE FEET, AS DESCRIBED IN SECTION D, WINTER STABILIZATION. JUTE MULCH NETTING ANCHORING SHALL BE PROVIDED, APPLIED IN CONTINUOUS OVERLAPPING ROLLS WITH THE CONTOUR. NETTING SHALL BE APPLIED FROM THE BOTTOM OF SLOPES UP. 8 GAUGE, 6" PLAIN IRON WIRE STAPLES SHALL BE APPLIED PER THE MANUFACTURER'S RECOMMENDATION.

NORTHEAST WILDFLOWER MIX:	ANNUALS:
14% PERENNIAL LUPINE	12% BACHELORS BUTTONS
7% LANCE LEAF COREOPSIS	8% BABY'S BREATH
6% DAVEY'S ROCKET	8% ROCKET LARKSPUR
6% PURPLE CONEFLOWER	8% SCARLET FLAX
5% BLACK EYED SUSAN	2% CATCHFLY
5% SIBERIAN WALLFLOWER	1% SPURRED SNAPDRAGON
4% CORN POPPY	
4% EVENING PRIMROSE	
2% BLANKET FLOWER	
2% SHASTA DAISY	
1% NEW ENGLAND ASTER	
1% WHITE YARROW	

C. EROSION CONTROL MAINTENANCE

THE FACILITY OPERATOR WILL BE RESPONSIBLE FOR THE PROPER OPERATION AND MAINTENANCE OF ALL EROSION CONTROL MEASURES; EACH SHOULD BE KEPT FREE OF DEBRIS.

D. WINTER STABILIZATION

PROVIDE WINTER STABILIZATION IN LIEU OF PERMANENT SEEDING AFTER SEPTEMBER 1, IN LIEU OF SODDING AFTER NOVEMBER 15, AND FOR ALL WORK REQUIRING TEMPORARY STABILIZATION AFTER OCTOBER 15 AS FOLLOWS:

STRAW MULCH: PLACE STRAW MULCH AT THE APPLICATION RATE OF 150 LBS/1000 sf ON DISTURBED AREAS LESS THAN 8% SLOPE AND NOT SUBJECT TO FLOWING WATER REQUIRING STABILIZATION. ANCHOR ALL MULCH WITH MULCH NETTING AND STAPLES OR WITH STAKES AND TWINE. STAKES AND TWINE SHALL BE APPLIED AT THE RATE OF 4 TO 6 PEGS PER SQUARE YARD WITH CRISS-CROSSED TWINE STRUNG TAUT BETWEEN ALL PEGS AND SECURED AT EACH PEG WITH ONE OR MORE TURNS OF TWINE.

EROSION CONTROL MIX MULCH: APPLY EROSION CONTROL MIX MULCH AS AN ALTERNATIVE TO STRAW MULCH OR MATS ON STEEP SLOPES ONLY AT RATES SPECIFIED IN DEP PUBLICATION "MAINE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES" (MOST RECENT EDITION).

MATS: PLACE FABRICATED MULCH AND NETTING CONTROL MATS WITH ANCHORING AS SPECIFIED BY THE MANUFACTURER, TO STABILIZE DISTURBED AREAS AND SLOPES GREATER THAN 8%, SUBJECT TO FLOWING WATER (SUCH AS SWALE OR DITCH SECTIONS), OR CUT SLOPE SUBJECT TO WEEPING GROUNDWATER.

RIP RAP: ALL RIP RAP MINIMUM D50=2", PLACED IN 4" LIFTS AS AN ALTERNATIVE TO STRAW MATS ON STEEP SLOPES OR FLOWING WATER CONDITIONS.

1. AGGREGATE FOR GRAVEL BASE

AGGREGATE FOR GRAVEL BASE SHALL BE SCREENED OR CRUSHED GRAVEL OF HARD DURABLE PARTICLES FREE FROM VEGETABLE MATTER, LUMPS OR BALLS OF CLAY AND OTHER DELETERIOUS SUBSTANCES. THE GRADATION OF THE PART THAT PASSES A 3 INCH SIEVE SHALL MEET THE GRADING REQUIREMENTS OF THE FOLLOWING TABLE:

SIEVE DESIGNATION	PERCENTAGE BY WEIGHT PASSING SQUARE MESH SIEVES			
	TYPE A AGGREGATE	TYPE B AGGREGATE	TYPE C AGGREGATE	TYPE D AGGREGATE
1/2 INCH	45-70	35-75	---	---
1/4 INCH	30-55	25-60	25-70	25-70
No. 40	0-20	0-25	0-30	0-30
No. 200	0-5	0-5	0-5	0-7

TYPE A AGGREGATE SHALL NOT CONTAIN PARTICLES WHICH WILL NOT PASS THE 2 INCH SQUARE MESH SIEVE.

TYPE B AGGREGATE SHALL NOT CONTAIN PARTICLES WHICH WILL NOT PASS THE 4 INCH SQUARE MESH SIEVE.

TYPE C & D AGGREGATE SHALL NOT CONTAIN PARTICLES WHICH WILL NOT PASS THE 6 INCH SQUARE MESH SIEVE.

EACH LAYER AS APPLIED SHALL BE ROLLED WITH A 20 TON ROLLER. THE MATERIAL AS SPREAD SHALL BE WELL MIXED WITH NO POCKETS OF EITHER FINE OR COARSE MATERIAL. OVERSIZED STONES SHALL BE REMOVED FROM THE AGGREGATE.

EACH LAYER OF AGGREGATE SHALL BE PLACED OVER THE FULL WIDTH OF THE SECTION. AGGREGATE BASE AND SUB-BASE COURSES MAY BE PLACED UPON FROZEN SURFACES WHEN SUCH SURFACES HAVE BEEN PROPERLY CONSTRUCTED.

THE SURFACE OF EACH LAYER SHALL BE MAINTAINED DURING COMPACTION OPERATIONS IN SUCH A MANNER THAT A UNIFORM TEXTURE IS PRODUCED AND THE AGGREGATE IS FIRMLY KEYED. THE MOISTURE CONTENT OF THE MATERIAL SHALL BE MAINTAINED AT THE PROPER PERCENTAGE TO ATTAIN THE REQUIRED COMPACTION AND STABILITY. COMPACTION OF EACH LAYER SHALL BE CONTINUED UNTIL DENSITY OF NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 "MODIFIED PROCTOR DENSITY" HAS BEEN ACHIEVED FOR THE FULL WIDTH AND DEPTH OF EACH LAYER AS APPLIED.

THE SURFACE TOLERANCE OF EACH BASE COURSE AS APPLIED SHALL BE 3/8 INCHES ABOVE OR BELOW THE REQUIRED TEMPLATE LINES.

2. AGGREGATE FOR SUB-BASE

AGGREGATE FOR SUB-BASE SHALL BE TYPE "D" (MDOT). IT SHALL BE FREE FROM VEGETABLE MATTER, LUMPS OR BALLS OF CLAY AND OTHER DELETERIOUS SUBSTANCES. SEE CHART ABOVE FOR TYPE "D" SIEVE DESIGNATION.

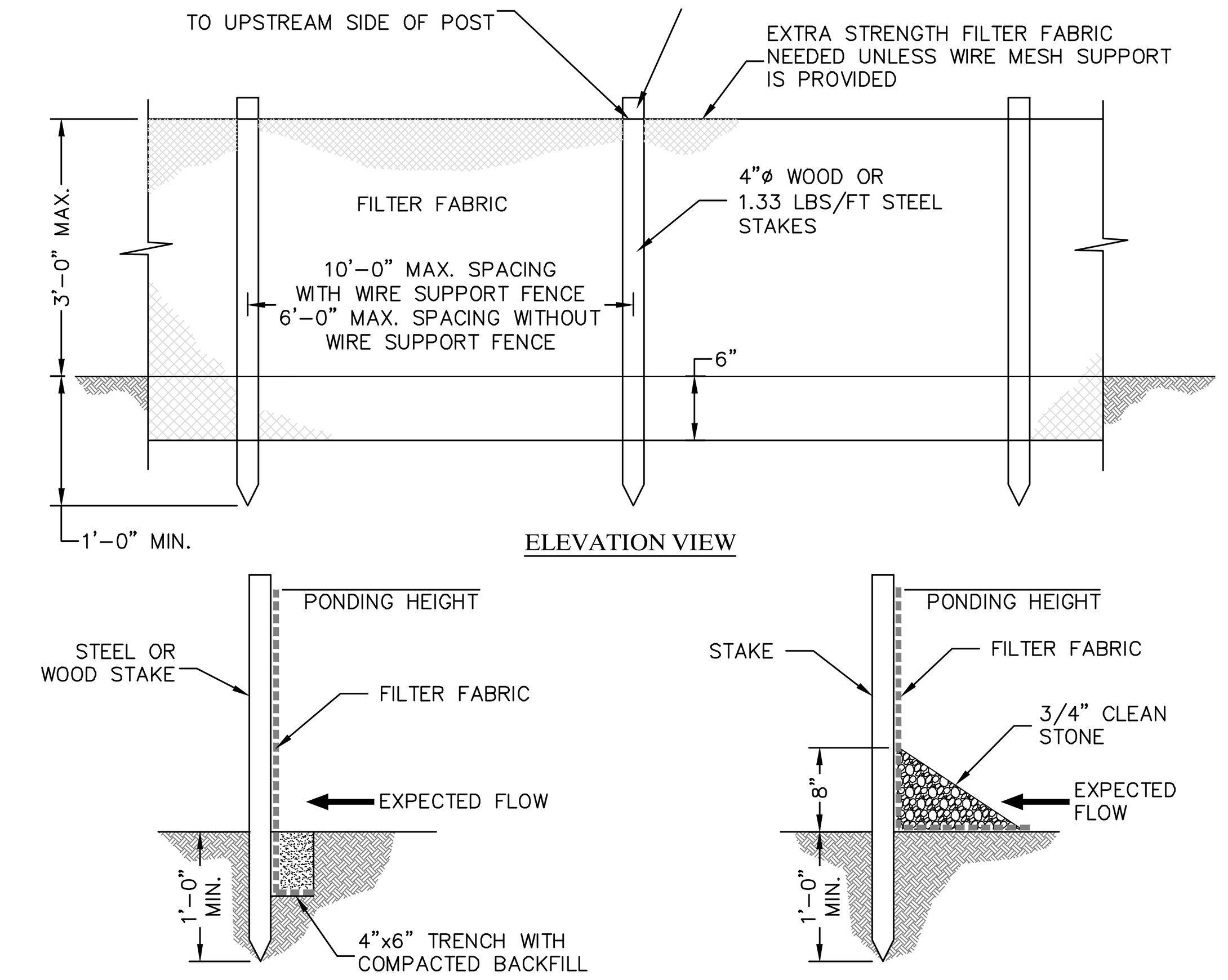
3. COMMON BORROW

COMMON BORROW SHALL CONSIST OF EARTH, SUITABLE FOR EMBANKMENT CONSTRUCTION. IT SHALL BE FREE FROM FROZEN MATERIAL, PERISHABLE RUBBISH, PEAT AND OTHER UNSUITABLE MATERIAL.

THE MOISTURE CONTENT SHALL BE SUFFICIENT TO PROVIDE THE REQUIRED COMPACTION AND STABLE EMBANKMENT. IN NO CASE SHALL THE MOISTURE CONTENT EXCEED 4 PERCENT ABOVE OPTIMUM.

4. STRUCTURAL BACKFILL

STRUCTURAL BACKFILL CONFORMING TO MDOT 703.20 SHALL BE UTILIZED IN THE ABSENCE OF GEOTECHNICAL REPORT RECOMMENDATIONS FOR FILL BELOW AND ADVANCE TO FOUNDATIONS, FOOTINGS AND SLABS. PROVIDE DEWATERING AND PERMANENT DRAINS WHERE INDICATED. COMPACT ALL STRUCTURAL BACKFILL TO 95% MODIFIED PROCTOR DENSITY. PLACE STRUCTURAL BACKFILL IN LIFTS OF 10"-12" MAXIMUM DEPTH.



TYPICAL INSTALLATION: SECTION VIEW

INSTALLATION WITHOUT TRENCHING OVER FROZEN GROUND OR HEAVY ROOTS: SECTION VIEW

NOTES:

PREFABRICATED SILT FENCE IS ACCEPTABLE IF INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. MAXIMUM RECOMMENDED SEDIMENT STORAGE HEIGHT IS 9".

REMOVED SEDIMENT SHALL BE DEPOSITED IN AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

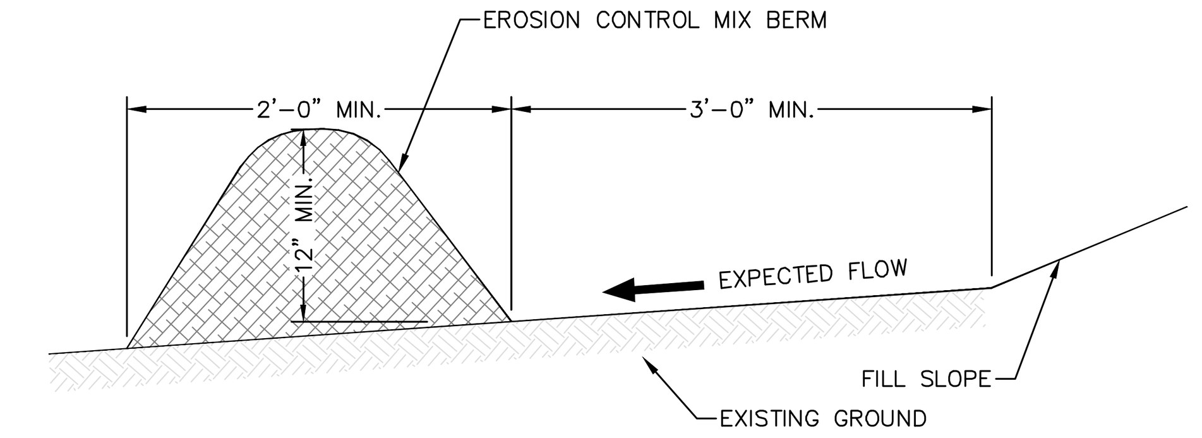
SHOULD THE SILT FENCE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL IS NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.

DO NOT PLACE SILT FENCE IN STREAMS OR CONCENTRATED FLOW CONDITIONS.

SILT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UP SLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

SILT FENCE DETAIL

NO SCALE

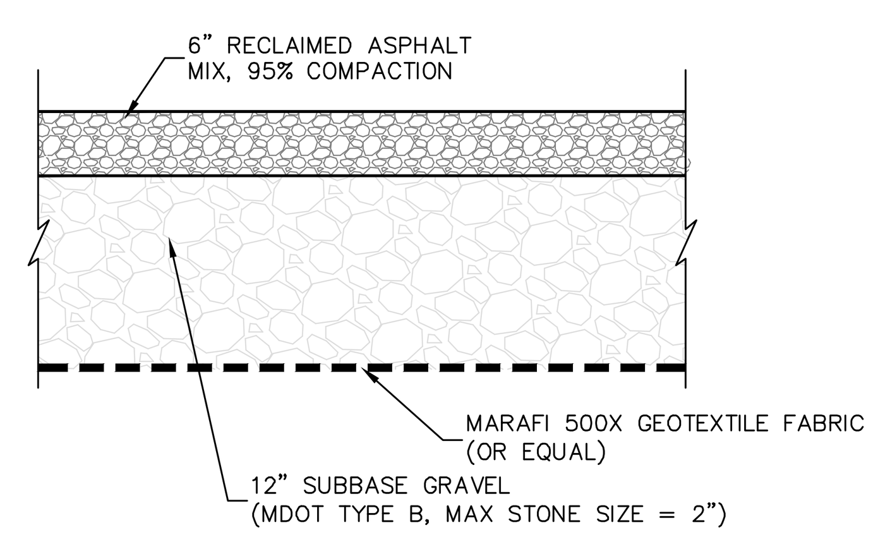


NOTES:

1. THE EROSION CONTROL MIX BERM SHALL CONSIST PRIMARILY OF ORGANIC MATERIAL INCLUDING SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS. WOOD OR BARK CHIPS, GROUND CONSTRUCTION DEBRIS, REPROCESSED WOOD PRODUCTS, REFUSE, PHYSICAL CONTAMINANTS, OR MATERIALS TOXIC TO PLANT GROWTH ARE NOT ACCEPTABLE.
2. THE MIX SHALL CONFORM TO THE FOLLOWING STANDARDS:
   A. ORGANIC CONTENT: 80% TO 100% (DRY WEIGHT)
   B. PARTICLE SIZE BY WEIGHT: 100% PASSING 6" SCREEN, 70%-85% PASSING ¾" SCREEN
   C. ORGANIC CONTENT SHALL BE FIBROUS AND ELONGATED
   D. NO STONES LARGER THAN 4" IN DIAMETER
   E. NO LARGE PORTIONS OF SILTS, CLAYS, OR FINE SANDS
   F. SOLUBLE SALTS CONTENT SHALL BE LESS THAN 4.0 mmhos/cm
   G. pH SHALL BE BETWEEN 5.0 AND 8.0
3. THE COMPOSTED BERM SHALL BE PLACED, UNCOMPACTED, ALONG A RELATIVELY LEVEL CONTOUR.

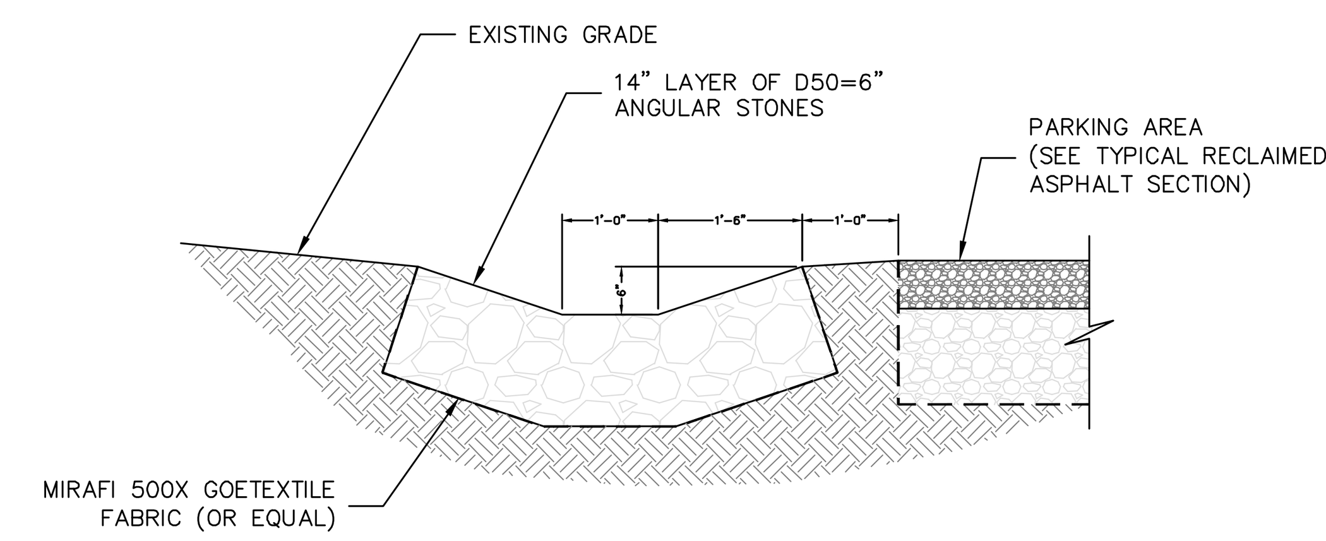
EROSION CONTROL MIX BERM

NO SCALE



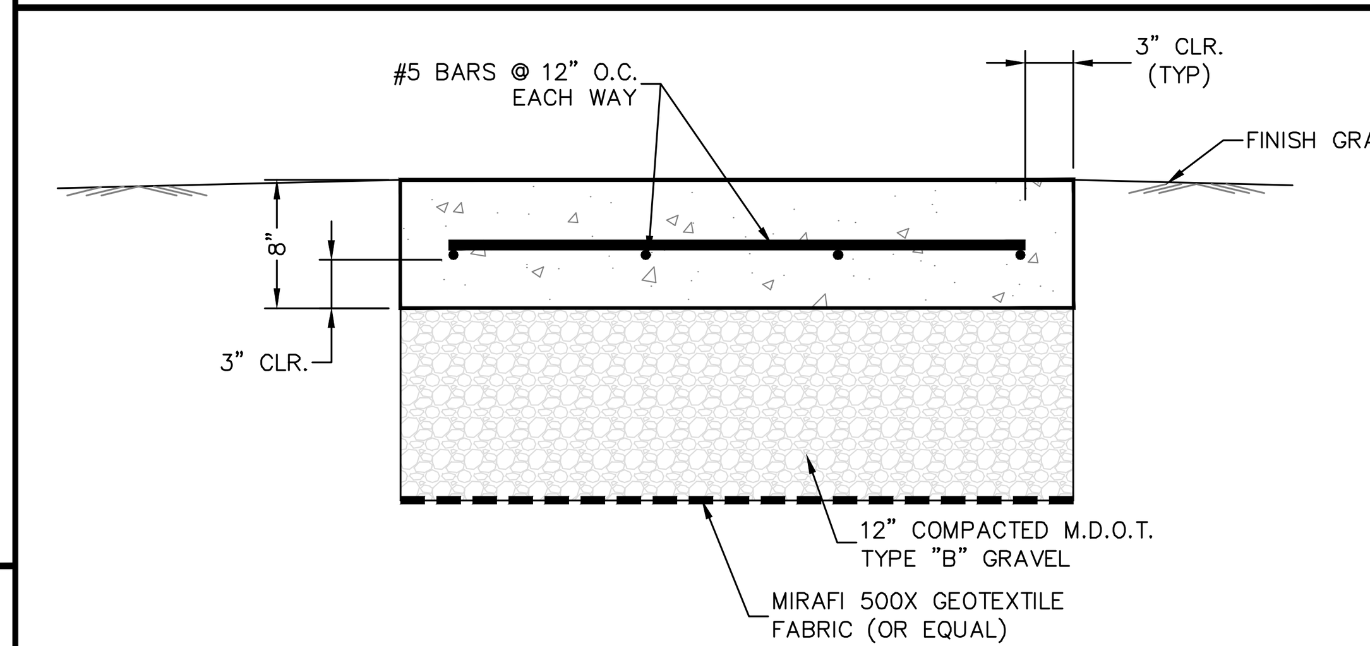
TYPICAL RECLAIMED ASPHALT SECTION

NO SCALE



STONE LINED SWALE SECTION

SCALE: 1/2" = 1'-0"

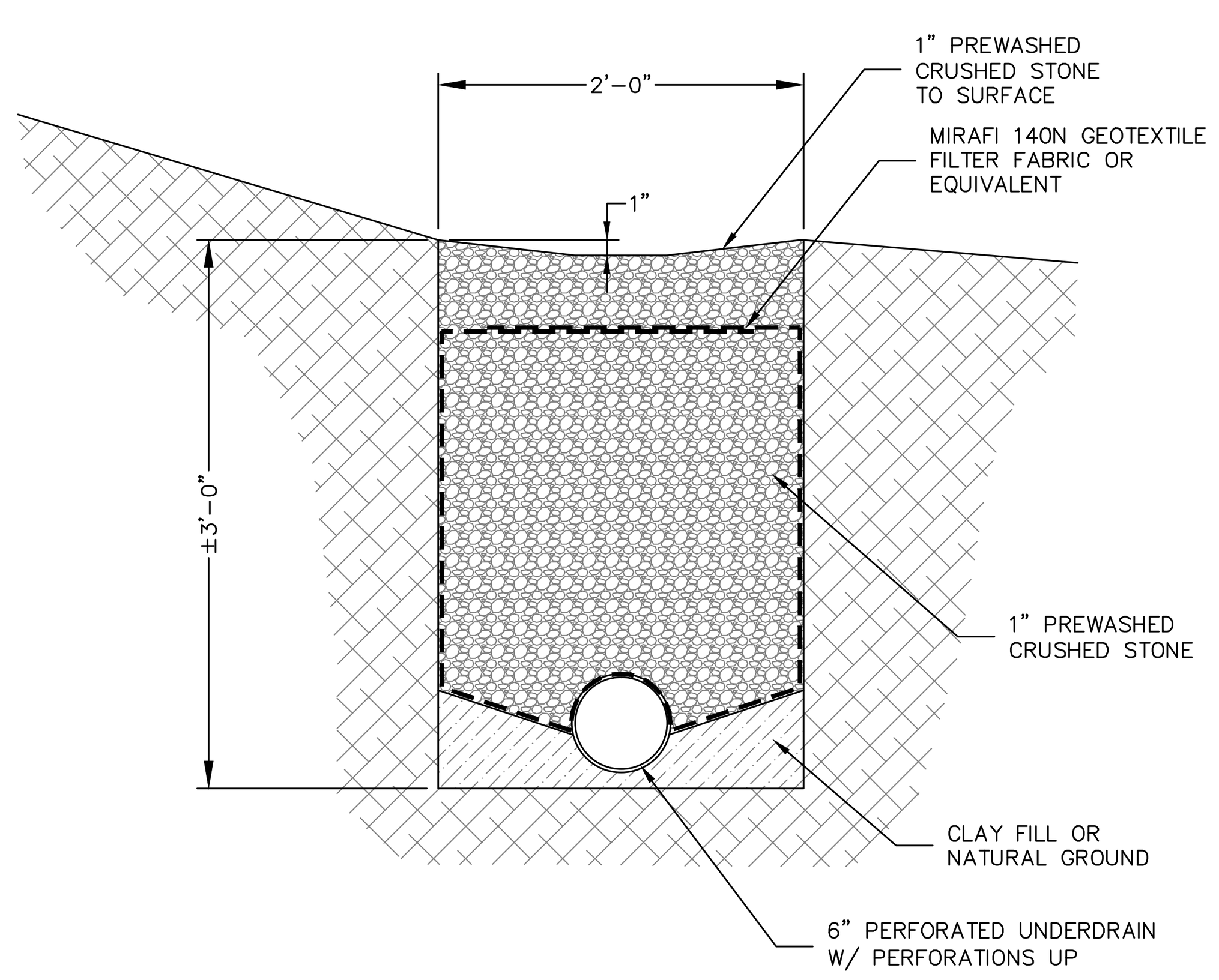


CONCRETE SPECIFICATION:

- 4000 P.S.I.
- SLUMP = 4" ± 1"
- 3/4" STONE
- FINE BROOM FINISH
- 6% AIR ENTRANEMENT
- CONTROL JOINTS 10' O.C.
- REINFORCING AND ANCHORING:
  - GRADE 60 DEFORMED BARS
  - ANCHOR BOLTS, 5/8"ø GALVANIZED BOLTS WITH HEAD EMBEDDED 5" MIN. IN CONCRETE. MATCH EXISTING ANCHOR BOLT GEOMETRY AND LOCATION FOR STEEL PIER CONNECTION TO SLAB

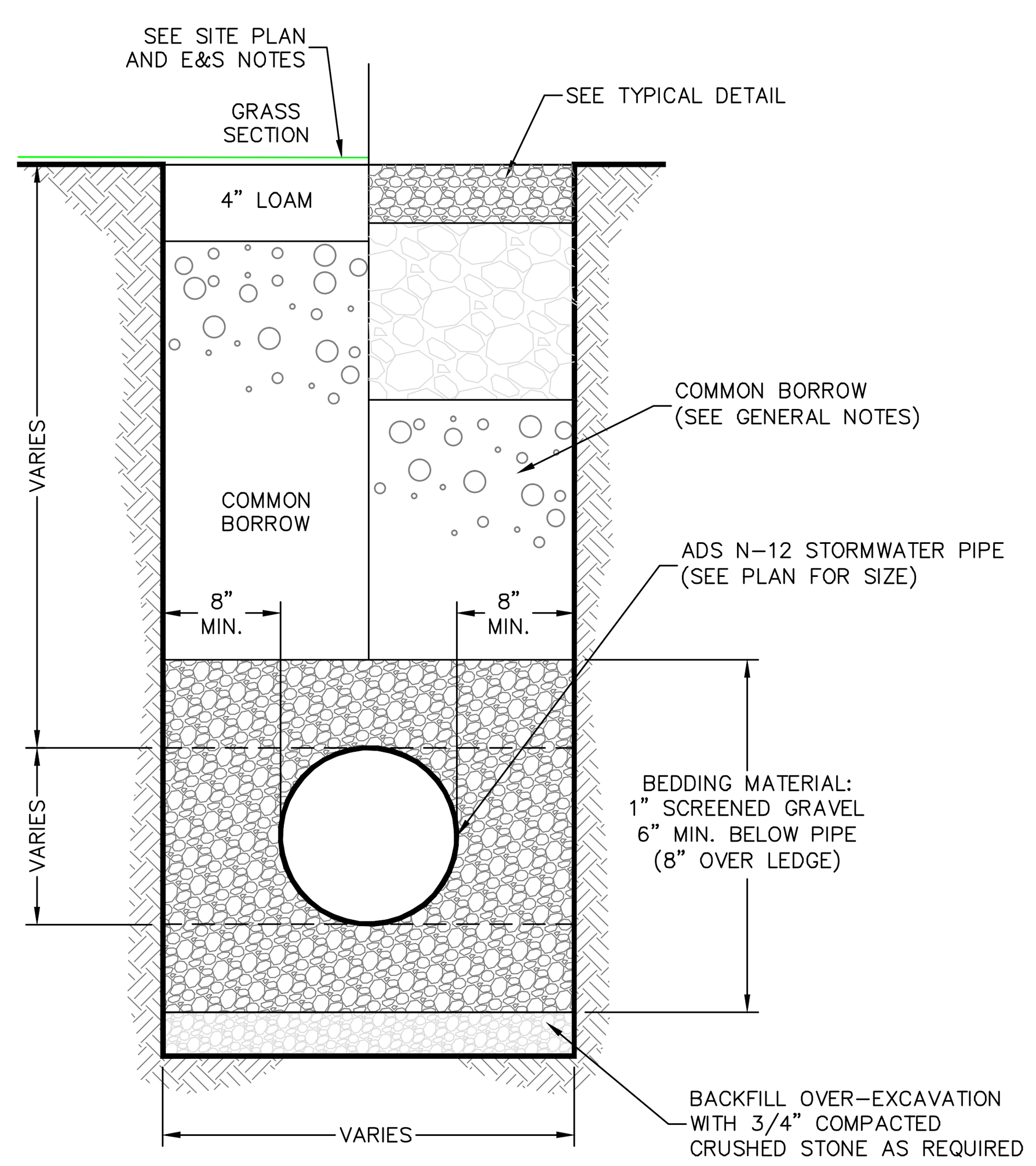
EXTERIOR CONCRETE SLAB DETAIL

NO SCALE



UNDERDRAIN TRENCH SECTION

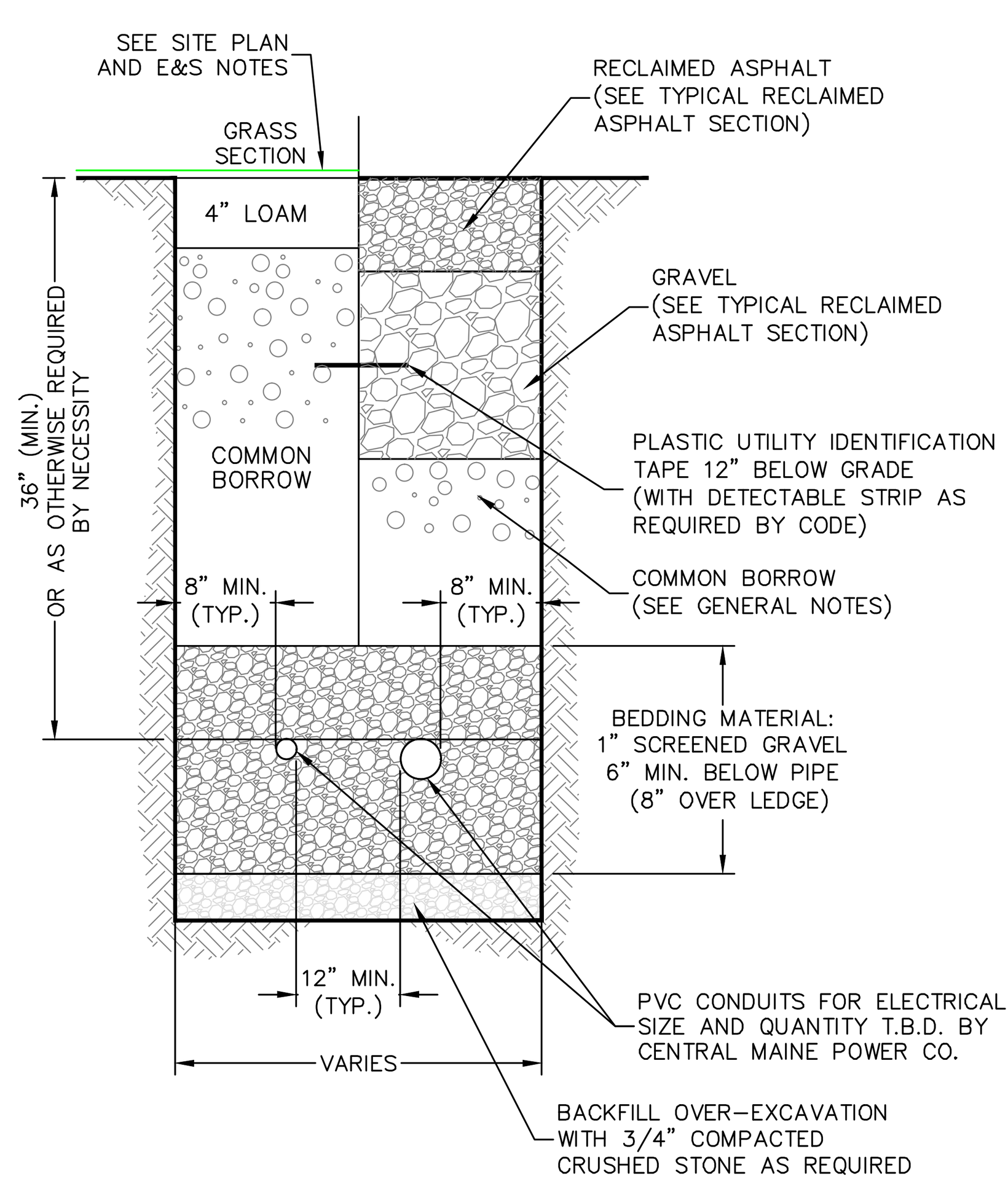
NO SCALE



NOTE:
1. COMPACT TRENCH BACKFILL IN 8" LIFTS TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 "MODIFIED PROCTOR DENSITY".

TYPICAL STORMWATER TRENCH SECTION

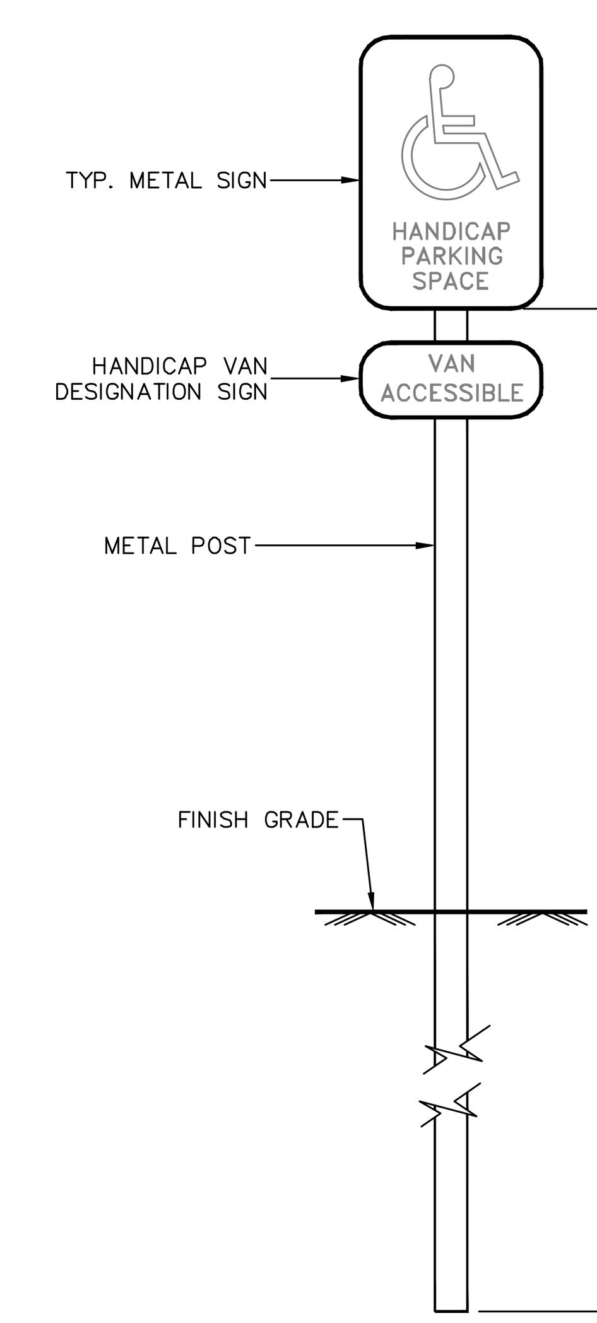
NO SCALE



NOTE:
1. COMPACT TRENCH BACKFILL IN 8" LIFTS TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-1557 "MODIFIED PROCTOR DENSITY".
2. TRENCH SECTION IS TYPICAL, QUANTITY OF LINES MAY VARY.
3. ALL ELECTRICAL WORK SHALL COMPLY WITH NATIONAL ELECTRIC CODES AND THE REQUIREMENTS OF THE SPECIFIC UTILITY.

ELECTRICAL TRENCH

NO SCALE



HANDICAP ACCESSIBLE PARKING SIGN WITH (VAN PLACARD)

NO SCALE

NO.	REVISIONS

SHEET TITLE: CIVIL DETAILS

SCALE: AS SHOWN

DRAWN BY: JAM/JDS

CHECKED BY: WBG

DATE: OCTOBER 20, 2015

CLIENT/PROJECT: MAINE INLAND FISHERIES AND WILDLIFE

LOCATION: RIVER ROAD

TOWN: RICHMOND COUNTY: SAGADAHOC STATE: MAINE

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STATE OF MAINE WILLIAM B. GARTLEY 7961 LICENSED PROFESSIONAL ENGINEER 10/20/2015

PROJ. NO. 2014-104

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